Western States Conference

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INTRODUCTION: Oncology practice should include consideration of survival, quality of life, and cost effectiveness. One strategy shown to improve these outcomes has been to incorporate a pharmacist into oncology clinics. Incorporation of pharmacists at other institutions has demonstrated significant cost savings with improved accountability in medication use processes. Our Medical Foundation recently opened an outpatient Cancer Center in downtown Sacramento, CA. The Cancer Center is not affiliated with a hospital for drug purchasing purposes and trained nurses prepare all chemotherapy and premedications; there is no pharmacist involvement. Conversely, the infusion center at our local hospital operates in conjunction with the hospital system and pharmacy staff. The goal of this retrospective study is to assess various cost-savings opportunities to justify the potential addition of clinical pharmacy services at our new Cancer Center.

METHODOLOGY: An electronic medical record database will be used to identify patients at the Cancer Center and at the hospital infusion center and a retrospective chart review will be conducted to compare the clinical intervention rates by pharmacists and nurses, emesis rates, error rates, and chemotherapy costs. The primary endpoints evaluated will be chemotherapy order clarifications, the incidence of delayed nausea and vomiting, errors, regulatory compliance, and costs associated with chemotherapy in terms of staffing and chemotherapy usage. Patient data will be collected on all clinic patients that received chemotherapy with a documented visit and note between July 1, 2012 and February 28, 2013. Differences in chemotherapy workflow will be described between sites and differences in chemotherapy preparation time will be compared by student t-test. Interventions, error, and emesis rates will be described using descriptive statistics and Likert scales (for type of emesis) and analyzed by chi-squared and Kruskal-Wallis tests, respectively. Differences in medication costs will be analyzed by student t-test.

RESULTS AND CONCLUSIONS: To be presented upon the completion of data collection and analysis.

ACPE #:0126-9999-13-011-L01-P
Learning Objectives:
- Describe the chemotherapy workflow differences between the new Cancer Center and the infusion center at our local hospital.
- Explain the possible justification of full-time pharmacy services at the Cancer Center through cost-saving opportunities.

2 - TAKING A PREPARATORY COURSE IN PHARMACY RESIDENCY ESSENTIALS IMPROVES THE SUCCESS RATE OF OBTAINING A RESIDENCY POSITION

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Marissa Adams, PharmD
Loma Linda University
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Presenting on Tuesday, May 14 at 4:00 PM in Sunset IV

Introduction:
The number of pharmacy schools in the United States is rapidly increasing, leading to more pharmacy graduates each year. The demand for pharmacy residency positions has increased to the point where there are more applicants than available positions1. In 2012, a total of 3,706 residency applicants submitted rankings to the match. Of those, 2,206 matched to a residency position2. Development of pharmacy elective courses geared towards preparing students for the residency application and interviewing process has led to an increased match rate up to 79%, compared to the national average of about 60%3. The purpose of this study was to determine the effectiveness of a newly implemented didactic course designed to provide students with the skills necessary to succeed in obtaining a residency position.

Methods:
A new elective course designed to increase residency match rates was developed and implemented at Loma Linda University School of Pharmacy. After drafting a syllabus, the course was presented to and approved by the curriculum committee. Following approval, the course was advertised to second and third year pharmacy students and students enrolled. Prior to the beginning of the first class, students were anonymously surveyed to assess their knowledge about the residency application process and their confidence in obtaining a residency position. The class met for two hours a week for five weeks. Lecture topics included an overview of the residency application process, how to utilize PhORCAS (Pharmacy Online Residency Centralized Application Service) to apply for residency, development of a curriculum vitae, writing a letter of intent, and interviewing skills. Students also participated in a mock interview with local residency program directors and were provided with feedback for improvement. Students were graded utilizing rubrics on their submitted curriculum vitae, letter of intent, and their mock interview. Following completion of the course, the students completed the same survey again to allow the investigator to assess changes in the students’ knowledge and confidence. Lastly, the investigator will survey the students from the class of 2014 after the pharmacy residency match in March 2014 to determine if any correlations can be made between participating in the residency elective and obtaining a residency position.

Results:
Results and conclusions will be presented.

ACPE #:0126-9999-13-012-L04-P

Learning Objectives:
- Discuss the effectiveness of a new residency elective course at a school of pharmacy.
- Describe the content of an elective residency preparatory course.

Introduction: Coagulase-negative staphylococci (CoNS) are a common contaminant in clinical microbiological cultures, however CoNS have the potential to cause life-threatening infections. Due to the relative rarity of these infections, less data exist as to treatment effectiveness. Vancomycin is the standard of care for CoNS bacteremia. Yet unlike methicillin-resistant Staphylococcus aureus (MRSA), little data exist correlating treatment effectiveness with vancomycin minimum inhibitory concentrations (MICs). At our institution MICs are not reported in the electronic medical record, only categorized susceptible/resistant classification is reported. Thus the decision to treat with vancomycin is made independent of MIC data. The present study aims to explore the impact of CoNS vancomycin MICs on patient outcomes among patients with CoNS bacteremia.

Methodology: A retrospective cohort study was conducted among patients admitted to a large tertiary-care referral teaching hospital between May 2009 and December 2011. Adult patients were potentially eligible for inclusion if treated with vancomycin, blood culture positive for CoNS with vancomycin MIC data available and no documented previous history of Staphylococcus aureus or Enterococcus. A single reviewer, blinded to MIC data, completed a medical record chart review to screen for inclusion/exclusion criteria and collect study data. Patients with true CoNS bacteremia who received at least two days of vancomycin therapy were included. True infections were identified based on clinical observations including vitals signs, white blood cell count, and presence of more than one CoNS positive blood culture within 24 hours. Multivariable regression modeling is planned to evaluate the association between CoNS vancomycin MICs and clinical outcomes while controlling for potential confounders.

Results: The study population included 1,366 patients with positive CoNS blood cultures, but only 207 of those patients were treated with vancomycin and had MIC data available. To date, chart reviews have been completed on 49 of these patients, with only seven exclusions due to the minimum age requirement. Chart reviews reveal that all patients within this preliminary group have at least one predetermined sign or symptom that suggests a true CoNS bloodstream infection. Indwelling devices, such as central venous catheters, were present in 22 cases (52%). Antibiotics administration within the 30 days prior to a positive CoNS blood culture occurred in 18 (43%) patient cases. Patients were admitted from a variety of settings including 26 (61%) from home, 3 (7%) from skilled nursing facilities and 12 (29%) transfers from outside hospitals. Mortality during the admission or within 30 days of discharge occurred in 11 (26%) patients. The total length of stay ranges between 4 and 64 days with a mean of 21 days. Treatment failure has only been observed in 3 (7%) patients reviewed to date. Final results and data analysis will be performed following completion of chart review.

Conclusion: If increased vancomycin MICs are found to be associated with decreased vancomycin treatment effectiveness for patients with bacteremia due to vancomycin-susceptible CoNS, then reporting MICs to clinicians may better inform treatment selection for these patients.

ACPE #:0126-9999-13-013-L01-P
Learning Objectives:
- Explain the correlation of coagulase-negative staphylococcus vancomycin minimum inhibitory concentrations with patient clinical outcomes.
Define the risk factors for poor clinical outcomes in coagulase-negative staphylococcus infections which may necessitate aggressive antimicrobial treatment.


4 - ENHANCING MEDICATION ADMINISTRATION: AUTOMATED DISPENSING CABINETS (ADC) CONVERSION
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

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Presenting on Tuesday, May 14 at 8:00 AM in Palm II

Objective
As automated dispensing cabinets (ADCs) are converted, the impact of new technology on nursing workflow will be assessed and evaluated for satisfaction, and efficiency.

Background:
The current institutional automated dispensing cabinet system has been in use for nearly two decades. Limitations of the current system include reporting ability for medication usage, storage capacity, security pockets and cumbersome controlled substance back-counts for nursing personnel. A recent decision to replace the current ADCs with a different vendor product should provide enhanced reporting capability, more secure storage, enhanced storage capability for controlled and non-controlled substances and provide efficient workflow systems for nursing staff.

Methods:
Two pilot nursing units were selected for initial ADC conversion. Technology options selected for new ADC implementation include the ability to remotely queue patient medications, increase in on-hand medication availability and stringent controlled substance dispensing.

Nursing satisfaction surveys assessing ADC medication accessibility, ease of use, controlled substance accountability procedures, perceived biometric scanner efficiency, ADC efficiency, nursing personnel perception of availability of medications and perception of pharmacy support will be analyzed pre- and post-implementation.

Time and motion studies will be conducted pre-and post- ADC conversion assessing nursing efficiency and workflow organization. The primary endpoint will be the difference in nursing interaction time at the ADC for both controlled and non-controlled medications, and any common stock items.

Results and Conclusions to be presented

ACPE #:0126-9999-13-014-L04-P

Learning Objectives:

- Describe features that can enhance automated dispensing cabinet utilization.
- List elements necessary to analyze pre-and post-intervention changes.

Introduction: Hospitals are attempting to decrease readmission rates to improve quality of care and to meet reimbursement requirements. The use of patient asthma education has been shown to decrease readmissions in lower income patients. Patient education has also been shown to increase adherence to an asthma action plan leading to improved asthma care. Patient asthma education is important in the emergency department (ED) setting. It provides the patient and caregivers with a better understanding of their barriers to adherence and compliance. This education helps to serve as a bridge between ED discharge and the patient’s follow up with a primary care provider. The primary objective of the project is to assess whether pharmacist provided asthma education for patients discharged directly from a pediatric ED following an exacerbation has an impact on asthma outcomes.

Methodology: This study was conducted at a level II pediatric ED. Patient inclusion criteria were age less than 18 years of age, presentation with an upper respiratory illness or breathing difficulty, and an asthma diagnosis. Patients admitted to the hospital were excluded. An information packet was given to and reviewed with the patient and/or parent(s)/guardian by a pharmacist. Patient education included a description of inhaler technique and discussion of when and how to use an asthma action plan in conjunction with medications. A pharmacist telephoned each patient 30 days after their ED admission to assess their albuterol use, medication comprehension, and asthma action plan. Additional education was provided by a pharmacist should a patient be admitted to the hospital. The primary endpoint is the effect education has on ED and hospital readmissions. Secondary endpoints include the determination of patient’s understanding concerning use of inhaler medications and action plans.

Results and Conclusion: The findings will be presented at the completion of this project.

ACPE #:0126-9999-13-015-L01-P

Learning Objectives:
- Evaluate patient barriers to education and what opportunities are available to overcome those barriers in the ED.
- Identify aspects of asthma education that could be updated at various institutions.

Background: Community-Acquired Pneumonia (CAP) has been a major cause of morbidity and mortality in adults. In 2009, it was estimated that 1.1 million people in the U.S. were hospitalized due to pneumonia and more than 50,000 people died from the disease. The Infectious Diseases Society of America (IDSA) and the American Thoracic Society (ATS) guidelines recommend the use of macrolides as empiric antimicrobial therapy for CAP in ambulatory patients without comorbidities or risk factors for drug-resistant S. pneumoniae (DRSP) infection. For those patients with comorbidities or risk factors for DRSP infections, the recommended empirical antibacterial therapies include a respiratory fluoroquinolone or combination therapy of a β-lactam plus a macrolide. Implementing guidelines or protocols has been shown to decrease mortality and length of hospital stay, however, to our knowledge, there is no study evaluating the empirical outpatient treatment of CAP in an underserved population.

In the state of Arizona, coccidioidomycosis (valley fever) is estimated to represent between 17%-29% of all CAP cases. In a study looking at the proportions of CAP patients who were tested for Coccidioides Species in two healthcare systems, testing rates of 2% and 13% were found.

Objectives:
1. To determine the adherence rates to the IDSA/ATS guidelines for the treatment of CAP as an outpatient empirical therapy.
2. To determine the proportion of CAP patients who were tested for coccidioidomycosis in an underserved population at El Rio Community Health Center.

Methods: A retrospective medical record review will be conducted at El Rio Community Health Center. The database will be screened to identify outpatient encounters from June 2008 through December 2011. The following ICD-9 codes will be used: 480.0-480.9, 481, 482.0-482.9, 483.0-483.8, 485. One hundred randomized adult patients with CAP receiving antibiotics will be evaluated for selection, dose and duration appropriateness based on IDSA guidelines.

Results and conclusion: Will be presented

ACPE #:0126-9999-13-016-L01-P

Learning Objectives:
- Describe the appropriateness of empirical treatment of outpatients with CAP in an underserved population.
- Describe the proportion of community-acquired pneumonia patients who are tested for coccidioidomycosis in endemic areas.


7 - IMPLEMENTATION OF AN INTERNAL ORAL CHEMOTHERAPY SERVICE WITHIN AN INTEGRATED HEALTH SYSTEM

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Sanjin Alajbegovic, PharmD
MultiCare Health System
Title: IMPLEMENTATION OF AN INTERNAL ORAL CHEMOTHERAPY SERVICE WITHIN AN INTEGRATED HEALTH SYSTEM
Introduction: Oral chemotherapy (OC) is becoming increasingly important treatment modality in patients with cancer and the National Comprehensive Cancer Network (NCCN) Task Force on Oral Chemotherapy predicts that OC drugs will make up more than a quarter of all chemotherapy agents in the pipeline. In addition, NCCN identifies the complexity of treatment regimens as one of the factors that is associated with nonadherence to OC, which calls for an increasing role of pharmacists in managing patients on OC regimens. Currently, the majority of patients at MultiCare Regional Cancer Center (MRCC) obtain OC medications at one of the multiple specialty pharmacies outside of MultiCare Health System (MHS). Due to the fact that multiple parties are involved in the process of delivering OC to patients (physicians, MRCC pharmacists, specialty pharmacies, insurance companies) makes it challenging for a MRCC pharmacist to monitor the status of OC prescriptions at any given time, which may lead to delays in the delivery of OC to the patient. The objective of this project is to increase the timeliness of OC by starting a pharmacist-led and financially sustainable OC service at MRCC.
Methodology: A baseline survey of oncology pharmacists at MHS was conducted to assess the current system for OC, including challenges and any desired modifications that would improve the current system. Based on the survey data and input from oncologists, pharmacists, and administrators, changes to the current system were made. The initial assessment of an OC prescription for appropriateness (i.e. review laboratory values, identify drug-drug interactions and potential dose adjustments) was standardized and completed by an MRCC pharmacist. The purpose of the assessment was to ensure safe and optimal OC pharmacotherapy utilization before the OC prescription is forwarded to the MHS outpatient pharmacy. The patient was then informed about the OC process and educated on the prescribed regimen.

The first phase of the project was a pilot study that tested the proposed changes and included MRCC patients age ≥ 18 years of age starting one of four pre-selected OC regimens. The pilot study took place from November 2012 to January 2013. The second phase of the project took place after the completion of the pilot study, from February 2013 to April 2013, after the preliminary data from the pilot study was assessed and the areas for improvement were identified. The second phase of the project was expanded to include patients starting any OC (with a few exceptions).

The primary endpoint will be the number of days from OC prescription fill to the anticipated OC start date and will measure the timeliness of access to OC. Secondary endpoints will include the number of pharmacist interventions (including dosage adjustment recommendations and identifying drug-drug interactions) and the financial sustainability of the project measured by the revenue generated.

Results and conclusion: not available, project still in progress.

ACPE #:0126-9999-13-017-L01-P
Learning Objectives:
- Describe the benefits of in-sourcing oral chemotherapy.
- Identify the role of pharmacists in managing patients on oral chemotherapy.

8 - RAISING THE BAR ON TTR: THE IMPACT OF SHORTENED LAB FOLLOW-UP INTERVALS ON TIME IN THERAPEUTIC RANGE (TTR)

B1. Ambulatory Care

Presented by:

Asif Ali, PharmD
Kaiser Permanente - Tri-Central Service Area
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Presenting on Tuesday, May 14 at 8:00 AM in Bay View

Introduction
The efficacy and safety of warfarin for the prevention of thromboembolic and hemorrhagic events is dependent on the time in therapeutic range (TTR). Studies have shown the risk of stroke for non-valvular atrial fibrillation (NVAF) patients is almost twice as high for a TTR of <60% compared to a TTR of >70%. Large variations in TTR have been reported between health systems and regions, posing potential outcomes and safety risks. In April 2012, the Kaiser Permanente Baldwin Park Anticoagulation Clinic implemented a test-of-change to improve TTR by shortening International Normalized Ratio (INR) follow-up intervals. The objective of this study is to compare the average TTR in actively managed NVAF patients with a TTR <60% between the pre- and post-implementation phases of the test-of-change. Differences in pharmacist workload, measured by the mean number of INR encounters to reach a therapeutic INR during the two phases were also compared.

Methodology
A randomized retrospective chart review was performed to validate the test-of-change to ensure the pharmacist’s instructions for a shortened INR follow-up interval were successfully completed by the patients. The follow-up INR interval was stratified into two groups based on a goal INR of 2-3. The moderately out-of-range group contained INR values between 1.6-1.9 and 3.1-3.9, for which the previous follow-up time of 3 weeks was reduced to 2 weeks. The severely out-of-range group contained INR values ≤ 1.5 and ≥ 4.0, for which the previous follow-up time of 2 weeks was reduced to 1 week. Patients were excluded from the study if they were newly started on warfarin, hospitalized during the study period, underwent a disruption in warfarin therapy according to a provider’s instructions, received vitamin K, or had a critical INR >5. A statistical analysis using a t-test was conducted to determine if shortening the INR follow-up interval led to an increase in the average TTR. A second analysis was conducted to determine if this process change was performed without additional average INR encounters.

Results and Conclusion
The study results and conclusions will be presented.

ACPE #:0126-9999-13-018-L01-P
Learning Objectives:
- Describe the impact of shortened duration between INR labs on time in therapeutic range.
- Describe the impact on the overall workload when a shortened INR interval is implemented.


9 - IMPLEMENTATION OF PHARMACIST-MANAGED TRANSITIONS OF CARE PROGRAM AT INTERMOUNTAIN MEDICAL CENTER

B1. Ambulatory Care
Presented by:

Ndidi Alino, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Bay View

Purpose: The process of moving patients from hospitals to other healthcare settings or even to their homes can pose significant challenges, not only to the patients, but also to healthcare professionals. Quality and value-based payment structures create financial incentives for health systems to develop processes to ensure a smooth patient experience across the continuum of care. While there are studies that suggest that pharmacist participation in transitions of care can improve clinical outcomes, the optimal model of care is unknown. One potential area of study is the use of ambulatory care pharmacists to provide transitional care shortly after discharge. This study will explore the impact of a pharmacist-managed transitional care service for recently discharged patients at Intermountain Medical Center

Methods: This prospective cohort study is approved by the institutional review board. Patients who are 18 years or older, are discharged from Intermountain Medical Center’s general medicine unit, and are able to participate in a telephone conversation are included. Patients are excluded from the study if discharged without the Intermountain Healthcare tactical discharge tool, and they are established patients of a non-Intermountain Healthcare primary care facility. Data collected include type of interventions made by the pharmacist, the timing of the intervention, and rate of medication discrepancies. The primary outcome measure is the incidence of 30-day and 90-day readmission for patients who receive pharmacist-provided transitional care services compared to a reasonably matched cohort of patients who did not. Secondary objectives are to describe the rates and types of medication discrepancies identified by pharmacists in the transitional care program and to correlate additional patient characteristics that may contribute to the incidence of medication discrepancies upon discharge. Data for this study are abstracted from the Intermountain Healthcare Enterprise Data Warehouse, discharge summaries, and other health records. Readmission rates before and after implementation of the transitional care service will be compared using the Student’s t-test. Relationship between patient characteristics and incidence of medication discrepancies will be evaluated using multivariate linear and logistic regression.

Results and conclusion will be presented.

ACPE #:0126-9999-13-019-L01-P

Learning Objectives:

Identify some of the challenges that occur during care transitions
Outline the evidence supporting the need for improved medication management during care transitions.


10 - EFFECT OF DEXMEDETOMIDINE VERSUS PROPOFOL ON OPIOID REQUIREMENTS IN MECHANICALLY VENTILATED PATIENTS

Presented by:
Proponents of dexmedetomidine often cite the agent’s analgesic properties as one of its main advantages over propofol and benzodiazepines. However, there are very limited studies utilizing endpoints such as analgesic requirements to provide supporting evidence for these claims. The primary purpose of this study is to compare opioid analgesic requirements in trauma patients receiving dexmedetomidine or propofol for sedation while being weaned from mechanical ventilation. Secondary outcomes of interest include percentage of time within target Richmond Agitation Sedation Scale (RASS), pain scores, time to extubation, need for reintubation, and medication-related adverse effects in adult trauma patients at a tertiary care, academic medical center. This is a retrospective IRB approved study. Electronic medical records will be used to identify adult trauma ICU patients intubated or mechanically ventilated with ventilation and sedation duration of at least 24 hours and receiving continuous infusion of dexmedetomidine or propofol for at least 12 hours prior to extubation between January 1, 2011 and December 1, 2012. Patients will be excluded if: age less than 18 years; history of alcohol or illicit drug abuse; acute hepatitis or severe liver disease; second or third degree heart block; on dialysis; receiving neuromuscular blocking medications; pregnancy or lactation. Demographic variables will include age, sex, weight, and race. Data collection will focus on sedative and analgesic doses, pain and RASS scores, respiratory rate, oxygen saturation, heart rate, blood pressure, time to extubation, need for reintubation, and medication-related adverse effects. Data analysis will include descriptive and inferential analyses conducted using a statistical software package. Chi-square or Fisher’s exact test will be used to compare categorical data with Student’s t or Mann-Whitney U test used for continuous data. The a priori alpha level is 0.05 for all analyses. Results and conclusion will be presented.

ACPE #:0126-9999-13-020-L01-P
Learning Objectives:
- Describe the differences in opioid analgesic requirements in trauma patients receiving dexmedetomidine or propofol for sedation while being weaned from mechanical ventilation.
- List additional outcomes of interest among trauma patients receiving dexmedetomidine or propofol for sedation while being weaned from mechanical ventilation.

Asthma, a chronic inflammatory disease of the airways, affects approximately 25 million Americans. Poor asthma control places a burden on patients as well as healthcare systems. National guidelines have recommended asthma education be provided at multiple points of care, including interventions by pharmacists. Previous studies involving pharmacists in asthma management have shown positive outcomes on asthma symptoms and healthcare utilization. In late 2012 Kaiser Permanente Kern County began an Asthma Care Management Pharmacy Program in which ambulatory care pharmacists and outpatient pharmacists were utilized to assist physicians and advanced practice providers in the management of adult patients with asthma. The program is an effort to improve appropriate medication usage by decreasing beta-agonist overuse and increasing compliance with inhaled anti-inflammatories and other controller medications. Active Kaiser Permanente members between the ages of 18-64 years with a diagnosis of asthma and a primary provider or allergist located in Kern County were contacted by an ambulatory care pharmacist if they were identified to have beta agonist overuse, defined as having 6 or more short acting beta agonist (SABA) canisters in the last 6 months or 8 or more SABA canisters in the last 12 months, and a controller/total asthma medication ratio (AMR) < 0.5. AMR has previously been shown to be a good marker for adequate therapeutic care in persons with asthma. Given its importance, the National Committee for Quality Assurance has added the AMR to the 2013 Healthcare Effectiveness Data Information Set (HEDIS) metrics. The patients identified were also flagged for outpatient consultation. Patients were excluded if they had a diagnosis of emphysema, COPD, cystic fibrosis, or acute respiratory failure.

This retrospective study aims to evaluate if pharmacist intervention in the ambulatory care and outpatient setting has helped to improve appropriate medication usage. Chart reviews were performed to collect data associated with the Asthma Care Management Pharmacy Program for a time frame 100 days pre pharmacist intervention and up to 100 days post pharmacist intervention. AMR was used as a primary outcome of adequate therapeutic care and compared pre and post pharmacist intervention. Secondary outcomes, which include number of asthma related urgent care visits, number of asthma related emergency department visits, Asthma Control Test score, and controller medication compliance rate, were measured pre and post intervention. Paired T-tests were used to compare asthma medication ratios as well as secondary outcomes. In addition to analyzing whether intervention by ambulatory care and outpatient pharmacists has helped increase appropriate use of asthma medications among adult patients with asthma, the analysis will help to identify intervention strategies that have greatest impact on patient outcomes to help guide utilization of limited resources. This study will also help to identify any limitations and barriers to intervention. Results and conclusions to be presented.

ACPE #:0126-9999-13-021-L01-P
Learning Objectives:
- Describe outcomes of utilizing pharmacists to help improve appropriate asthma medication usage.
- Explain limitations and barriers identified in implementing an Asthma Care Management Pharmacy Program.


12 - EVALUATION OF ANTIPSYCHOTIC PRESCRIBING PRACTICES IN PATIENTS WITH METABOLIC SYMPTOMS UPON PSYCHIATRIC ADMISSION
A5. Neuro-Psych or Pain Management Agents

Presented by:

Priya Amin, PharmD
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Introduction: Studies report that individuals with serious mental illness are at a greater risk of cardiovascular mortality compared to the general population. Furthermore, cardiovascular mortality in schizophrenia and bipolar disorder has increased since the introduction of second-generation antipsychotics (SGAs), also known as atypical antipsychotics. Their use has been associated with reports of dramatic weight gain, insulin resistance or diabetes and dyslipidemia. Since there is a close association between obesity, diabetes, dyslipidemia and cardiovascular disease, it is important to try to minimize these metabolic side effects in psychiatric patients, especially in those who have risk factors for cardiovascular disease.

Among the screenings that are recommended by the American Diabetes Association (ADA) and the American Psychiatric Association (APA), weight and height (for BMI calculation) and a fasting lipid panel should be obtained at baseline and after the initiation of any antipsychotic medication. Lifestyle education including nutrition and physical activity counseling should be provided for all patients who are overweight or obese, particularly if they are starting treatment with an SGA. Lastly, if any condition such as dyslipidemia or significant weight gain is identified, appropriate treatment should be initiated. Characterizing antipsychotic prescribing practices when treating patients with a primary psychiatric diagnosis and co-morbid symptoms of metabolic syndrome would be useful information to determine if treatment strategies in this patient population can be optimized during inpatient admission.

Methodology: The current study is a retrospective, single-center study evaluating antipsychotic prescribing practices between two attending physicians based on the presence of metabolic symptoms. Patients admitted to the acute adult inpatient psychiatry unit between February 28, 2011 and June 30, 2012 with the co-occurrence of metabolic symptoms (triglyceride level ≥ 200 mg/dL and/or BMI ≥ 30 kg/m2) who received at least one scheduled dose of one or more antipsychotic medications were included in the study. The primary outcome measure is to characterize providers’ antipsychotic prescribing practices when treating patients with co-morbid symptoms of metabolic syndrome (TG ≥ 200 mg/dL and/or BMI ≥ 30 kg/m2) upon inpatient psychiatric admission at the University of California, San Diego Health System Hillcrest. Secondary outcomes include comparison of prescribing practices used when treating patients with and without co-morbid metabolic symptoms, comparison of prescribing practices between psychiatry attending physicians, types of treatment strategies employed in patients continuing on or being initiated on treatment with a second generation antipsychotic (SGA), and association between prescribed antipsychotic and baseline characteristics including patient’s age, length of stay or diagnosis at discharge.

Results/Conclusion: The results and conclusion will be presented after completion of data collection and analysis.

ACPE #:0126-9999-13-022-L01-P
Learning Objectives:
- List common metabolic side effects of second-generation antipsychotics
- Explain how the risk of metabolic symptoms from antipsychotics may affect inpatient prescribing practices

Presenting on Tuesday, May 14 at 9:30 AM in Dockside

Introduction:
Antimicrobial stewardship programs have been shown to minimize the unintended consequences of antimicrobial use such as lowering the risk of drug toxicities, decreasing the length of hospital stay, reducing the patient’s risk of developing complications related to the use of prolonged IV antimicrobial products, decreasing the prevalence of resistant microorganisms, and enhancing the cost-effectiveness of antimicrobial treatment. In an effort to follow the Infectious Diseases Society of America’s leadership, the VA Roseburg Healthcare System (VHAROS) implemented a pharmacy managed telehealth antimicrobial stewardship program in conjunction with the Portland VA Medical Center (PVAMC) that focused on the appropriate use of inpatient antimicrobial therapy.

Methodology:
The PVAMC infectious disease department, the part time infectious disease physician at VHAROS, and VHAROS pharmacy collaborated to develop a pharmacy managed antibiotic stewardship program including the development of guidelines for intravenous to oral route conversion for antimicrobial therapy, de-escalation of vancomycin therapy, and avoidance of double anaerobic antimicrobial coverage for the general medicine unit of the VHAROS. Strict inclusion and exclusion criteria were developed for the antimicrobial stewardship policies established. Frequent telehealth meetings were established between PVAMC and VHAROS to discuss implementation of the program, specific complicated cases, methods to improve the program, and data measured. On weekdays, pharmacy students assisted a pharmacy resident in evaluating all patients receiving antimicrobial medications and, based on the specific inclusion and exclusion criteria, determined if antimicrobial intervention was necessary. If antimicrobial intervention was deemed to be appropriate, a verbal recommendation was made to the hospitalist.

Results & Conclusion: Will be discussed

ACPE #:0126-9999-13-023-L01-P
Learning Objectives:
Describe implementation of a pharmacy managed antimicrobial stewardship in a rural facility.
Outline the role of pharmacy involvement in antimicrobial stewardship.


14 - EXPANSION OF PHARMACY-MANAGED INTRAVENOUS (IV)-TO-ORAL (PO) CONVERSION TO INCLUDE ANTIEPILEPTIC DRUGS (AEDS)
B4. General Clinical Practice

Presented by:
Avo Arikian, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Royal II
Introduction:
Hospital-implemented IV-to-PO conversion programs have been shown to reduce medication costs, provide high levels of patient comfort and satisfaction, reduce IV medication usage and the subsequent risk of infusion-related complications, and reduce the length of hospital stay. While many AEDs have excellent oral bioavailability that allows inclusion in pharmacy-managed IV-to-PO programs, research supporting this practice is lacking.

The addition of several AEDs to Community Regional Medical Center’s (CRMC) pharmacy-managed IV-to-PO conversion program has been recently approved by CRMC’s Pharmacy and Therapeutics Committee. The AEDs included in the pharmacy-managed conversion program include: lacosamide, levetiracetam, phenobarbital, phenytoin, fosphenytoin, and valproic acid.

Methodology:
A retrospective, pre- and post- implementation chart review will be performed. The primary objective is to determine the cost savings associated with the program expansion, based on drug acquisition costs of the aforementioned AEDs. Secondary objectives are: efficacy (based on seizure incidence) and safety (based on drug-related adverse events, in particular with phenytoin). Eligible patients must either be able to receive and tolerate scheduled (not “as needed”) oral medications via the oral or gastric feeding tube route, or be able to receive and tolerate a diet or enteral feeding (via gastric feeding tube). Patients with the following criteria will be excluded: nausea, vomiting and/or diarrhea in the last 24 hours; gastric output that exceeds 300 mL on two or more occasions in the previous 24 hours; use of a feeding tube that terminates distal to the stomach (e.g. jejunal tube); active gastrointestinal bleeding; patients who have had an observed or electroencephalogram (EEG)-proven seizure in the past 48 hours; and patients with a Glasgow Coma Scale less than or equal to eight without an EEG demonstrating no epileptiform activity within the past 48 hours.

Data collection will include: intravenous and oral antiepileptic drugs prescribed; their doses, routes, frequencies, and number of doses received; seizure activity (documented through progress notes and electroencephalogram results); adverse drug reactions with phenytoin (specifically the incidence of nystagmus, ataxia, and altered mental status related to supratherapeutic drug levels); therapeutic drug levels; documentation of intravenous-to-oral conversions by either pharmacists or physicians, and whether the patient was converted back to the intravenous form; admission day on which the patient met all institutional inclusion/exclusion criteria for conversion to oral; admission day on which the patient was actually converted to oral; days with nausea/vomiting/diarrhea in the previous 24 hours; days with gastric output greater than 300 mL on two or more occasions in the previous 24 hours; days with a feeding tube distal to the stomach; days with active gastrointestinal bleeding; days with seizure activity within the past 48 hours; days with a Glasgow Coma Scale less than nine without an electroencephalogram demonstrating no epileptiform activity within the past 48 hours.

Results and Conclusion:
To be presented.

ACPE #:0126-9999-13-024-L01-P
Learning Objectives:
- Describe the cost savings associated with the inclusion of several AEDs to the pharmacy-managed IV-to-PO protocol.
- Describe the safety and efficacy of systematically converting epileptic patients on AEDs from IV-to-PO.

15 - ESTABLISHMENT OF A PHARMACIST-MANAGED ORAL CHEMOTHERAPY PROGRAM
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Ashley Armentrout, PharmD
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Presenting on Tuesday, May 14 at 8:00 AM in Sunset I

Introduction: Oral chemotherapy provides many advantages over intravenous formulations. Accordingly, the oral agents are becoming more widespread treatment options for many oncologic indications. This transition from intravenous to oral chemotherapy is causing a shift in patient care. Patients at Good Samaritan Regional Medical Center receiving oral chemotherapy are not provided with the same quality and continuity of care as patients receiving intravenous chemotherapy. An ambulatory care oncology pharmacist can expand the quality and continuity of care through providing patient education, helping the patient navigate through the pharmacy benefits process, and providing regular follow-up and healthcare contact. Unfortunately, funding a pharmacist in the outpatient setting is difficult. To offset this cost, the patients will have the option of filling the prescription through a Samaritan Health Services Specialty Pharmacy. This will provide financial stability and the funding of a pharmacist in the outpatient setting. Additionally, cost-avoidance to the health care system will be seen by having a pharmacist provide adequate assessment of therapy, education, and follow-up.

Methodology:
Stage 1: A six-month retrospective review of eight common oral chemotherapeutic agents prescribed was performed to determine the number of patients receiving these agents. With this information a proforma was completed taking into account expected revenue and expenses of opening a specialty pharmacy. Interviews of the hematology and oncology providers and nurses were performed to assess the need of pharmacist services and current education and follow-up practices.
Stage 2:
1. The implementation of a specialty pharmacy, which involves obtaining appropriate certifications and specialty pharmacy contracts, developing a protocol for patients to be referred to the specialty pharmacy, and proper benefits investigation and filling of the prescription.
2. Developing standardized patient education for oral chemotherapy agents, protocol for follow-up, and a collaborative practice agreement for supportive care for patients referred from the Samaritan Oncologists.

Results: In process

Conclusion: The process of opening up a specialty pharmacy and development of the patients referred to our service continues to be implemented. Overall the mission of the project is to provide standardized patient education and follow-up, improving medication adherence, outcomes, and continuity of care. Challenges encountered in the development of this program and potential solutions will be presented.

ACPE #:0126-9999-13-025-L01-P
Learning Objectives:
- List key advantages and disadvantages of oral chemotherapy.
- Explain the benefits a pharmacist can provide in the outpatient oncology setting.

INTRODUCTION: Alcohol use disorders have been reported to be present in up to 25% of general medicine patients and up to 47% of trauma patients. Abrupt cessation or decrease in alcohol consumption can precipitate alcohol withdrawal syndrome which consists of symptoms ranging from tremors and sweating to seizures, delirium, and death. The goals of alcohol withdrawal management are early identification of symptoms and provision of drug therapy to relieve patient discomfort and prevent progression to serious and life-threatening complications. The shortened Clinical Institute Withdrawal Assessment (CIWA) is a ten-point scale that has been validated in the hospital setting for management of alcohol withdrawal. It is currently the assessment tool utilized at University of California San Diego Health System (UCSDHS) to monitor severity of alcohol withdrawal and facilitate symptom-triggered administration of benzodiazepine therapy. Unfortunately, not all patients are candidates for symptom-triggered management of alcohol withdrawal as dictated by this scale. Some examples of patients at increased risk of adverse events when managed by the shortened CIWA scale include those with disease states that confound vital sign and symptom assessment, liver dysfunction or advanced age which may lead to decreased metabolism of benzodiazepines, and severe withdrawal or delirium tremens which warrant closer attention and more aggressive therapy. Upon evaluation of alcohol withdrawal management at UCSDHS, we found inappropriate use of the shortened CIWA protocol in all of these patient populations. As a result, we implemented changes to the alcohol withdrawal order set to raise provider awareness and provide alternative options for patients who are not good candidates for the CIWA protocol.

METHODS: This was a quality improvement study that did not require Institutional Review Board approval. The intervention(s) were reviewed by the Pharmacy and Therapeutics committee and implemented into computerized physician order entry. The primary objective of this study was to evaluate whether modification of an alcohol withdrawal order set would reduce the duration of benzodiazepine therapy and the number of reported adverse events associated with alcohol withdrawal management. Patients 18 years or older were included if they were admitted to the intermediate or intensive care unit for at least 24 hours, had at least one documented CIWA score measurement or a documented diagnosis of alcohol withdrawal, and received at least one dose of benzodiazepine for alcohol withdrawal treatment. A retrospective chart review was conducted on 50 randomly selected patients who were managed for alcohol withdrawal prior to order set modification and 50 randomly selected patients who were managed after order set modification.

RESULTS AND CONCLUSIONS: Will be presented

ACPE #:0126-9999-13-026-L01-P

Learning Objectives:
- Describe modifications made to the alcohol withdrawal order set at University of California San Diego Health System
- Describe the effect of alcohol withdrawal order set modifications on the duration of benzodiazepine therapy and the number of reported adverse events related to alcohol withdrawal management
17 - OPTIMIZATION OF ACUTE AND CHRONIC DRUG THERAPY IN CYSTIC FIBROSIS: IMPACT OF PHARMACY AS PART OF THE INTERDISCIPLINARY CF TEAM

B6. Pediatric or Gender Specific Care

Presented by:

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Presenting on Tuesday, May 14 at 8:30 AM in Sunset II

Introduction
Cystic fibrosis (CF) is a chronic disease that affects multiple organ systems requiring lifelong management with both pharmacological and none-pharmacological therapies. Due to the potentially complex nature of treatment and medication burden, clinical pharmacists can be fundamental in optimizing therapy in inpatient and outpatient settings, facilitating continuity of care. Pharmacists are able to provide comprehensive, direct-patient care by selecting and monitoring acute and chronic drug therapy assessing and addressing medication adherence challenges, and providing education to patients, families, and other health care professionals. To date, no study has been designed to analyze the direct patient care activities that pharmacists provide to CF patients in the United States. The objective of this study is to assess the impact of early clinical pharmacy interventions on patient outcomes acute CF exacerbations, including antimicrobial selection, appropriate continuation of chronic maintenance therapy, and appropriate monitoring parameters.

Methodology
This is a longitudinal, retrospective cohort study of adult and pediatric patients with CF, followed by the pulmonary teams, admitted to the University of Arizona Medical Center diagnosed with a CF exacerbation during either the pre-intervention period, 6/1/2008-12/31/2008, or post-intervention period, 6/1/2011-12/31/2011. The evaluated intervention includes a detailed admission patient care plan that is composed within 24 hours of hospital admission by a clinical pharmacist whose practice involves inpatient and outpatient care of patients with CF. This consultation includes overview of patients’ medical history, review of outpatient medication history including assessment of adherence, evaluation of respiratory culture history, recommended antimicrobial therapies, continuation of chronic therapies, and appropriate monitoring parameters during admission. Data collection includes patient demographics, significant co-morbidities, respiratory cultures dating 12-months prior to admission, time to ordering appropriate drug therapy (antimicrobials, other acute medications, and chronic therapy), appropriate changes to antibiotics based on new culture results during admission, monitoring parameters, drug interactions, and adverse drug events. Descriptive and inferential statistical analyses will be completed with STATA version 11.1 software. Baseline demographics and incidence of adverse drug events and drug interactions between the two intervention periods will be assessed using Chi-square test. A linear model will be used to evaluate outcomes such as time to appropriate drug therapy (acute and chronic) and monitoring parameters, time to baseline forced expiratory volume in one-second (FEV1), and length of stay.

Results
Data collection completed and analyses pending. Results will be presented.

Conclusion
Conclusion(s) will be presented.
Learning Objectives:

1. Explain the process of selecting antimicrobial agents, other acute therapy and continued chronic therapy and corresponding monitoring parameters as part of the management of cystic fibrosis exacerbations.
2. Describe outcomes of patients admitted with a CF exacerbation before and after implementation of an innovative, continuity of care clinical pharmacy model.


18 - COMMUNITY PHARMACY-BASED PHYSICIAN CLINICS AND PATIENT KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING COLLABORATIVE PRACTICES
B2. Community Practice

Presented by:

Albert Bach, PharmD  
Post Graduate Year 1 Residency in Community Pharmacy Practice  
abach@usc.edu

Presenting on Tuesday, May 14 at 8:00 AM in Sunset V

Introduction:
The role of pharmacists has advanced from concentrating on medication dispensing to focusing on providing direct patient care. The literature is replete with examples of successful pharmacist-physician patient care collaboration in ambulatory care clinics and hospitals. There is limited data on these relationships in the community pharmacy. Community pharmacies are situated in various locations including, medical buildings, mass merchandisers, and completely stand-alone. In recent years, some mass retailers have introduced nurse practitioner staffed urgent care model clinics in the general store, typically near the pharmacy. However, there is no literature on a physician-run chronic care clinic situated in an independent pharmacy and its implications on patient perceptions of collaborative disease state management.

Methods:
A paper-based survey will be conducted to assess patient knowledge, attitudes, and practices regarding pharmacist-physician managed disease states under a collaborative practice. Surveys will be administered from January 1, 2012 to February 28, 2013 to a convenience sample of patients of an internal medicine physician who practices within the pharmacy-based clinic and a medical building clinic. Patients included in the survey will be new and established patients, 18 years of age and older, visiting their physician for acute and chronic medical issues at either clinic site. Non-English speaking patients were excluded. Data collected will include demographics, perceptions of the pharmacist and their ability to collaborate with physicians and choice of pharmacy. Survey responses will be compared between both locations to determine the influence that location of the medical practice may have on patient perceptions of possible pharmacist-physician collaborative practices.

Results:
To be determined
Describe patient challenges in implementing pharmacist-physician collaborative working practices
Describe methods for pharmacists to improve patient perceptions of pharmacist-physician collaborative practices


19 - ADDRESSING THE DSRIP GOALS FOR PNEUMONIA – IDENTIFYING OPPORTUNITIES FOR TREATMENT OPTIMIZATION
A1. Infectious Disease - Anti-infective Agents

Presented by:
Dominick Bailey, PharmD
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Dominick.Bailey@ucdmc.ucdavis.edu

Presenting on Tuesday, May 14 at 8:00 AM in Dockside

Background: The delivery system reform incentive pool (DSRIP) proposal has identified ten interventions that require special attention for planning and implementation to aid in focusing improvements in the education environments of academic medical centers in California. Project 4 (Category 2) specifies conducting medication management to help improve outcomes within four key disease areas. One of the goals includes improving outcomes by conducting medication management in any form to this patient population. The University of California Davis Medical Center (UCDMC) has opted to address pneumonia as the next key target disease states to meet the DSRIP goals from 2010-2015. This project does not specify specific metrics to meet improvement, allowing each institution to target areas specific to their institution. This study was undertaken to identify potential targets for improvement amongst the patient population at UCDMC.

Study Objective: Identify specific opportunities upon which pharmacists can intervene to improve health care delivery and outcomes associated with pneumonia

Methodology: An EMR report of patients discharged with a principal or secondary diagnosis of pneumonia between January 1, 2012 and March 31, 2012 was generated to identify the study population. Of that pool, 125 charts were selected in chronological order for analysis. Seventy seven different data points are being collected to analyze trends. Specific areas of analysis will include: drug choice, dose appropriateness, tolerability, route of administration issues, and transitions of care issues such as patient compliance and factors associated with inability and unwillingness to complete therapy post discharge. Continuous variables will be compared between groups using two-sample t-tests. Categorical variables will be compared between groups using chi-square tests.

Results and conclusions: Will be presented

ACPE #:0126-9999-13-029-L01-P
Learning Objectives:
Review relevant IDSA pneumonia guidelines in the treatment of HAP, CAP, and HCAP.
Describe at least one common medication optimization opportunity for pharmacists in the care of patients with pneumonia.

20 - CLINICAL AND ECONOMIC IMPACT OF A PHARMACIST-MANAGED HOSPITAL TO HOME PROGRAM FOR HEART FAILURE PATIENTS

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Sarah Bajorek, PharmD
University of California, San Diego Transitions of Care Pharmacy Residency
sabajorek@ucsd.edu

Presenting on Tuesday, May 14 at 2:00 PM in Sunset III

INTRODUCTION:
Heart failure (HF) is a complex disease state that is associated with high rates of readmission and a significant cost burden. Pharmacist involvement in post-discharge HF management resulted in increased medication compliance and knowledge and reduction in hospital readmission and mortality rates. In addition, medication reconciliation at admission can help identify patients with poor medication knowledge and who will likely require more intensive discharge management. The University of California, San Diego (UCSD) recently implemented a comprehensive pharmacist managed transitions of care program in HF patients, which includes medication reconciliation at admission and discharge, discharge counseling and post discharge follow up. However, there are limited data regarding clinical intervention importance, time analysis and cost analysis associated with this model.

METHODOLOGY:
This is a retrospective, single-center study evaluating the impact of the pharmacists’ clinical intervention on patient outcomes as well as the time associated with performing and potential cost-avoidance of the intervention. The primary objective is to describe the type, impact and cost-avoidance of the clinical interventions made by the pharmacist during each point in the transition. Secondary outcomes to be evaluated are: time-analysis associated with the pharmacist managed transitions of care program 30-day readmission rates and length of stay. Results from the study will help identify opportunities for potential resource allocation when the service expands to other high-risk patient populations (e.g. HIV, chronic kidney disease, acute kidney injury, diabetes mellitus, COPD/asthma, bone marrow transplant, pneumonia, acute thrombosis/DVT/PE).

Patients will be identified by screening the cardiology service list for specific diagnosis or past medical history (e.g. heart failure with reduced ejection fraction (HFrEF), heart failure with preserved ejection fraction (HFrEF), systolic heart failure, diastolic heart failure, cardiomyopathy), analyzing daily B-natriuretic peptide (BNP) results, analyzing daily loop diuretic usage, or by other members of the multidisciplinary team. Patients will be included if they are 18 years of age or older with a diagnosis of HF and excluded if they expire during primary hospital stay.

RESULTS:
Data analysis is currently being conducted.

CONCLUSION:
Conclusion pending data analysis.

ACPE #:0126-9999-13-030-L01-P
Learning Objectives:
Describe the role of the pharmacist in the transition of care program at the UCSD Medical Center.
List the estimated cost-avoidance associated with pharmacist clinical interventions in the transition of care program.

21 - THE ROLE OF PYRIDOXINE IN PREVENTING LINEZOLID ASSOCIATED MYELOSUPPRESSION

A1. Infectious Disease - Anti-infective Agents

Presented by:

Mira Bakas, PharmD
USC School of Pharmacy - Acute Care
trufasiu@usc.edu

Presenting on Tuesday, May 14 at 8:30 AM in Dockside

Linezolid is the first antibiotic in the oxazolidinone class. Due to its low rate of cross resistance, high bioavailability and its extensive gram-positive activity, linezolid is widely used in clinical treatment. However, use of prolonged administration of linezolid is limited due to the hematologic toxicities of thrombocytopenia and anemia. In an aftermarket study, the incidence of thrombocytopenia (plt <100 x 10^9 plt/L) was observed in 32% of patients who received linezolid for >10 days. Linezolid-induced thrombocytopenia has been reported several times in the past but anemia related to linezolid has only been noted recently.

Drug-induced myelosuppression has been observed with several classes of antimicrobials. One general mechanism of antibiotic related myelosuppression and the one proposed to contribute to linezolid associate thrombocytopenia is through production of drug-induced antibodies that cause platelet destruction. The exact mechanism of anemia with linezolid is not certain but it is proposed that mitochondrial protein synthesis is implicated. Ringed sideroblasts have been found in linezolid associated myelosuppression which suggests that there is a pyridoxine responsive pathophysiology. However, studies regarding the effectiveness of pyridoxine in preventing thrombocytopenia and anemia associated with linezolid therapy have not come to a general consensus. The purpose of the study is to perform a retrospective, chart review to assess the incidence of thrombocytopenia and anemia among patients receiving extended treatment with linezolid. A cohort of all patients admitted to the Keck Hospital of USC that were treated with linezolid for more than 7 days will be evaluated for rates of thrombocytopenia and anemia. Patients will be separated into the intervention group having received linezolid concomitantly with pyridoxine and the control group which only received linezolid. The intervention group will be matched and compared to the control group in a 2:1 ratio. Concurrent medication use will also be analyzed to determine if other common medications linked to thrombocytopenia could be responsible for the myelosuppression. Underlying kidney disease and administration of CRRT will also be tracked since both can be responsible for myelosuppression. The data for the two groups will be compared for statistical significance and results and conclusions will be presented.

ACPE #:0126-9999-13-031-L01-P
Learning Objectives:

- Explain the mechanism of action of linezolid induced thrombocytopenia and anemia and the rationale behind initiating concomitant pyridoxine therapy.
- Describe the effect pyridoxine has on reducing the incidence of thrombocytopenia and anemia in patients on prolonged linezolid therapy.

22 - THE IMPACT OF A PHARMACIST REVIEW ON PSYCHIATRIC PATIENTS BOARDED IN THE EMERGENCY DEPARTMENT

B4. General Clinical Practice

Presented by:

HUSSAIN BAKHSH, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Royal II

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Category: B4. General Clinical Practice
IRB Status: Received

The Impact of A Pharmacist Review on Psychiatric Patients Boarded in the Emergency Department

Introduction: Adverse financial and clinical outcomes have been documented as a result of boarding patients in the emergency department (ED). The term boarding is generally defined as the time spent in an emergency room awaiting a hospital bed or transfer to another inpatient facility. ED length of stay is significantly longer (3.2 times) in patients who present with psychiatric complaints and is commonly in excess of 24 hours in boarded patients. Emergency rooms are poorly equipped to deal with psychiatric patients, and boarded patients may not receive optimal care while awaiting transfer. To date, the use of Emergency Department Pharmacist (EDP) to review the pharmacotherapy of psychiatric patients boarded in the ED has not been described. The purpose of this study is to identify the rate, type and severity of medication error interventions occurring following an EDP review of psychiatric patients boarded in the ED.

Methods: This is a prospective observational study conducted from December 1, 2012 until inclusion of 100 patients. The pharmacist observer presents in the ED to observe the EDP performing their usual activities during staffed hours (14:00-22:30). The EDP notifies the observer when he or she is rounding on patients in the psychiatric unit in the ED. Recovered medication errors will be grouped and classified by the observer during data collection. Each medication error intervention will be evaluated by one ED physician and one psychiatrist and categorized by severity according to the following criteria; (1) intercepted potential adverse drug events, (2) mitigated adverse drug events, (3) ameliorated adverse drug events, and (4) errors with little or no potential for harm.

Results and Conclusion: Will be presented.

Learning Objectives:
1- Identify the rate of medication error interventions following an emergency department pharmacist review of psychiatric patients boarded in a community hospital ED.
2- Identify the most common type of medication error identified during the emergency department pharmacist review of psychiatric patients boarded in a community hospital ED.

Keywords: Interventions, Medication errors, Medication reconciliation, Mental health, Pharmacist, Psychiatry.

ACPE #:0126-9999-13-032-L01-P
Learning Objectives:
Identify the rate of medication error interventions following an emergency department pharmacist review of psychiatric patients boarded in a community hospital ED.
Identify the most common type of medication error identified during the emergency department pharmacist review of psychiatric patients boarded in a community hospital ED.
**23 - THE RETURN ON INVESTMENT OF A CLINICAL PHARMACIST IN AN OUTPATIENT AMBULATORY CARE SETTING**

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

**Cody Ball, PharmD**  
Group Health Cooperative  
[ball.c@ghc.org](mailto:ball.c@ghc.org)

**Presenting on Wednesday, May 15 at 9:30 AM in Sunset III**

Introduction: The emphasis on affordability in health care requires the ongoing evaluation of all areas within the health care system including services provided by pharmacists. Clinical pharmacists are a valuable asset in delivering high quality care, ensuring safety, and driving affordability for patients. In the ambulatory care setting, clinical pharmacists engage in a variety of tasks including: new member onboarding, medication reconciliation, chronic disease management, comprehensive medication reviews, and implementing medication use management initiatives. These areas of emphasis can decrease the risk for serious adverse outcomes, decrease cost, and improve quality of care as measured through the Healthcare Effectiveness Data and Information Set (HEDIS) and the Five Star Quality Rating System for Medicare Advantage Plans.

Clinical pharmacists are part of the patient care team in the integrated healthcare system at Group Health (GH) in Washington State. The integrated system focuses on the overall health of members leading to improved patient outcomes.

The outcomes will be used to identify if each area of work clinical pharmacists are responsible is providing a positive financial savings. This will ascertain the overall value clinical pharmacists provide and determine the return on investment (ROI). The results will be used to emphasize the areas which will provide the greatest financial benefit to GH.

Methodology: Submission to the Institutional Review Board is not required as this is an analysis of the financial savings provided from the work completed by clinical pharmacists and no patient information will be collected. Ambulatory clinical pharmacists currently working in an outpatient clinic will track weekly the number of patient encounters for the specified areas (new member onboarding, medication reconciliation, chronic disease management, and comprehensive medication reviews). This data will be totaled by intervention type to determine the total number of interventions per week by encounter type. As the standard work varies for each type of patient encounter, clinical pharmacists will be monitored to identify the amount of time required on average to complete each area of work (e.g., 30 minutes to complete a comprehensive medication review). Through identifying the time required to complete each encounter type, the cost (salary and benefits) will be determined to employ a clinical pharmacist for each encounter. Each type of patient encounter will be assessed to determine the savings provided based on internally identified savings. Additionally, evidence from published clinical trials based on the number needed to treat to avoid an adverse outcome will be applied to determine the cost avoided through interventions made by the clinical pharmacists. Based on this analysis, a total financial savings will be identified by encounter type. From the number of interventions tracked by clinical pharmacists a savings will be associated to each individual encounter.
The resulting financial analysis of each encounter type will be used to calculate a total ROI for employing a clinical pharmacist in an ambulatory care setting.
Results: To be presented.

ACPE #:0126-9999-13-033-L04-P
Learning Objectives:
- Explain the importance of showing the return on investment a clinical pharmacist provides in an outpatient ambulatory clinic setting.
- Describe the return on investment a clinical pharmacist provides in an outpatient ambulatory care setting.


24 - ORAL HYPOGLYCEMIC MEDICATION ADHERENCE AND ASSOCIATION WITH GLYCEMIC CONTROL IN A VETERAN POPULATION LIVING ON THE ISLAND OF HAWAI’I
B1. Ambulatory Care

Presented by:
Chaz Barit, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Bay View

Introduction:
Diabetes affects 20% of all Veterans utilizing the Veteran Affairs health care system. The benefits of glycemic control to reduce associated complications in diabetic patients have been well established in the literature. However, assessing medication adherence to oral hypoglycemic agents and its association with glycemic control has been hard to evaluate.

Purpose:
To evaluate adherence to oral hypoglycemic medications and its impact on glycemic control in a diabetic Veteran population from the island of Hawai’i.

Methods:
The study is a retrospective chart review evaluating the impact of adherence to oral hypoglycemic agents and its impact on glycemic control. This study will be done at the Veterans Affairs Pacific Islands Health Care System which is a part of the largest integrated healthcare systems in the US. Veterans will be recruited from a report generated by the diabetes measure VA dashboard for the island of Hawai’i. Using the VA database, demographic data and clinical information will be gathered. The VA database will be used to gathered complete refill history of oral hypoglycemic medications. Refill data will be collected 90 days prior to the HbA1c identified from the dashboard report. Refill data will be used to determine adherence by calculating the medication possession ratio. Correlation between adherence and HbA1c will be analyzed using correlation statistics.

Results and conclusion will be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-034-L01-P
Learning Objectives:
Describe medication possession ratio.


25 - MENTORED ADULT IMMUNIZATION IMPACT PROGRAM: IMPROVING ADULT INFLUENZA AND PNEUMOCOCCAL VACCINATION RATES IN THE INPATIENT SETTING

A1. Infectious Disease - Anti-infective Agents

Presented by:
Bret Barnes, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Dockside

Introduction:
Vaccine-preventable disease levels are currently at the lowest they have ever been. However, many adults remain under-immunized, missing opportunities to protect themselves against diseases such as influenza, and pneumococcal disease, while also negatively impacting the potential for outbreaks of disease in the general population. Despite the availability of safe and effective vaccines, immunization rates continue to fall short of national public health goals. It is estimated that over ten million American adults who have an indication for pneumococcal vaccine do not receive it, and each year many more forego annual influenza vaccination, placing themselves and those around them at risk for illness and death.

The most common manifestation of pneumococcal disease is pneumonia with an estimated morality rate of 5 to 7% among the adult population. The mortality rate associated with other more invasive forms of the disease such as bacteremia and meningitis is much higher at an estimated rate of 20-30%. Influenza can have serious health consequences as well, resulting in more than 200,000 hospitalizations and up to 49,000 deaths annually in the United States.

Methods:
This study was done in conjunction with the American Society of Health-Systems Pharmacists (ASHP). The design of this study was a randomized, retrospective, un-blinded, chart-review. Baseline data was gathered from electronic medical records (EMR) for patients admitted during December 2011 through January 2012. Post-intervention data was gathered from the EMR for patients admitted during December 2012 through January 2013. A total of 100 patient charts were reviewed. Data regarding screening, completeness of screening form, scanning of screening form, inputting orders, administration time, education and documentation was all gathered during the baseline data collection period. A gap analysis was performed to identify areas to be targeted that may lead to improvement in immunization rates. From this analysis, areas for improvement were identified.

To address these gaps, the following changes were made:
1) Education (Live hospital-wide nurse training and patient education material formulated)
2) Modified screening form and process

After changes were made, post-intervention data was gathered. The newly developed immunization screening form and revised process are still a part of our institution’s vaccination process and will continue to undergo continuous quality improvement.

Results:
Primary Endpoint for this study was overall vaccination rates in each patient care area and hospital-wide averages. Secondary Endpoints were patient refusals and appropriate screening.
Conclusion: To be determined once results are analyzed and evaluated

ACPE #:0126-9999-13-035-L01-P

Learning Objectives:
- Describe the challenges/barriers to integrating a clinical pharmacist into an inpatient immunization process.
- Describe the potential role a pharmacist can have on immunization rates.


26 - IMPACT OF PHARMACY INTERVENTION TO REDUCE INAPPROPRIATE STRESS ULCER PROPHYLAXIS AMONG A COMMUNITY HOSPITALIST TEAM

A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

Shayla Barraclough, PharmD
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Presenting on Tuesday, May 14 at 8:00 AM in Mission Bay Foyer

Purpose: The most recent stress ulcer prophylaxis (SUP) guidelines for hospitalized patients were published in 1999 by the American Society of Health-System Pharmacists (ASHP). Over the past decade, the frequency of SUP in hospitalized patients has ranged from 27% to 71%, with no indication in up to 70%. This overprescribing trend is associated with Clostridium difficile infections, pneumonia, vitamin B12 deficiency, hypomagnesemia, fracture risk, and significant economic costs. The purpose of this study is to assess the current rate of SUP among the hospitalist team in non-critically ill adult medicine patients in our 563-bed acute care facility, implement a clinical pharmacist intervention with education of SUP guidelines and a risk assessment screening tool, and evaluate post-intervention rate of SUP.

Methods: Using the electronic medical record, a retrospective review (pre-intervention) of 110 patients admitted to three adult medical units by the hospitalist team and initiated on a formulary acid suppressing agent (pantoprazole or famotidine) were analyzed for appropriate use of SUP based on a risk assessment screening tool developed using current guidelines and primary literature. Education regarding the appropriate use of acid suppressive therapy for stress ulcer prophylaxis was provided to all members of the hospitalist team, as well as to clinical pharmacists. The providers were given live verbal education as well as supplemental written information. The risk assessment screening tool and communication form was also introduced and providers received education on utilizing the form. Following education, the principle investigator (PI) performed a prospective chart review (post-intervention) daily on patients admitted to the designated medical units by a member of the hospitalist team. This review determined if inclusion and exclusion criteria were met and if the education and risk assessment tool were effective in decreasing inappropriate use of SUP among non-critically ill adult medicine patients at this institution. If SUP was started inappropriately or conversely, was indicated but not started, the PI placed the screening tool and communication form into the patients’ charts with appropriate recommendations. The pre-intervention period (control group) will be compared to the post-intervention period to assess change in rate of inappropriate SUP therapy. The following outcome measures will be analyzed: number of patients with therapy discontinued based on the intervention, average length and cost of therapy, cost savings based on discontinuation of inappropriate therapy and adverse effects due to acid suppressive agents. Statistical analysis will utilize the Student’s t-test for continuous variables with a p value of ≤ 0.05 to
demonstrate a statistically significant difference. Ninety-eight patients in both arms of the study were necessary to achieve power of 80%. This project was approved by the institution’s Investigational Review Board.

Results and Conclusion: Data is currently being collected. Results and conclusion will be available during presentation.

ACPE #:0126-9999-13-036-L01-P
Learning Objectives:
- Explain the recommendations for stress ulcer prophylaxis (SUP) in non-critical patients and the potential long-term side effects associated with prolonged use of these agents
- Describe the role of a pharmacist to reduce inappropriate stress ulcer prophylaxis (SUP)


27 - EVALUATION OF FIBRINOLYTIC THERAPY IN COMPLICATED PLEURAL EFFUSIONS
B3. Critical Care

Presented by:

Laura Baumgartner, PharmD
University of Colorado Hospital
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Presenting on Tuesday, May 14 at 8:30 AM in Executive 715

Introduction: Complicated pleural effusions are a common source of morbidity and mortality for hospitalized patients. Parapneumonic effusions develop in 36-66% of patients with bacterial pneumonia with approximately one third of these patients failing conventional treatment with antibiotics and chest tube drainage. Although infection is the leading cause of complicated pleural effusions, malignancy and hemothoraces are common etiologies as well. Historically, patients that failed chest tube placement would undergo invasive and complicated surgical procedures. Intrapleural administration of fibrinolytic therapy may play an important role in reducing the frequency of failed chest tube drainage and subsequent surgery. The pathogenesis of fibrin deposition, which prevents drainage of the chest tube and leads to treatment failure, is a result of alterations in the balance of procoagulant and fibrinolytic activity. Intrapleural administration of fibrinolytic drugs is thought to be effective for the management of complicated pleural effusions because of their ability to initiate local fibrinolysis, cleave intrapleural fibrin deposits, and decrease the viscosity of the pleural fluid.

Treatment of complicated pleural effusions with fibrinolytic therapy still remains controversial today. There is currently no definitive data available in the literature regarding the dose of t-PA that should be used in the treatment of complicated pleural effusions. Institutions are using doses of intrapleural t-PA that range from 2-50 mg given anywhere between one and eight times. The aim of this study is to describe the use of fibrinolytic therapy in the treatment of complicated pleural effusions at a large academic medical center, as well as to examine the dose-related outcomes associated with intrapleural t-PA.

Methodology: Patients receiving intrapleural t-PA and/or Dornase alfa at the University of Colorado Hospital for the treatment of complicated pleural effusions from January 1, 2004 to December 1, 2012 were included in this study. The primary endpoint of this study is the percent of patients receiving t-PA that avoided the need for secondary interventions, which will be measured by radiographic outcomes and referral for thoracic surgery. The secondary endpoints are dose-related outcomes of intrapleural t-PA (outcomes of ≤10 mg doses of t-PA...
compared to >10 mg doses of t-PA), outcomes based on type of effusion, outcomes of t-PA compared to t-PA + Dornase alfa, and bleeding complications associated with t-PA.

Results: Data collection and analysis are currently in progress.

Conclusions: Conclusions are pending based on the results of data collection.

ACPE #:0126-9999-13-037-L01-P

Learning Objectives:

- Explain the role of intrapleural t-PA and/or Dornase alfa in the treatment of complicated pleural effusions at a large academic medical center.
- Describe the optimal dosing strategy for intrapleural t-PA administered for complicated pleural effusions.


28 - AN EVALUATION OF A PHARMACIST-MANAGED ACID SUPPRESSION THERAPY PROTOCOL

B4. General Clinical Practice

Presented by:

Craig Beck, PharmD
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Presenting on Tuesday, May 14 at 10:00 AM in Royal II

Critically ill patients are at risk for developing gastrointestinal (GI) bleeding due to stress-related ulcers. While the pathogenesis of stress ulcers in the intensive care unit (ICU) is probably multifactorial, the only two independent risk factors significantly associated with increased bleeding risk have been found to be respiratory failure (mechanical ventilation ≥48 hours) and coagulopathy (platelet count <50,000 mm3, INR>1.5, or PTT >2 times control value). Prophylactic options include histamine-2 receptor antagonists (H2RAs), proton pump inhibitors (PPIs), sucralfate, and antacids. Several clinical trials and meta-analyses have found H2RAs and PPIs equally efficacious in preventing stress ulcer bleeding. Large clinical trials and published guidelines recommend against the routine use of prophylactic acid suppression in patients outside of the ICU and recommend H2RAs as a primary prophylactic agent with PPIs and/or sucralfate as alternatives in critically ill patients. Furthermore, clinical trials have not demonstrated any significant impact with stress ulcer prophylaxis (SUP) in general ward patients.

Acid suppression therapy has been associated with risks. H2RAs have been suspected of causing thrombocytopenia. Proton pump inhibitors and H2RAs have also been associated with increased risk of community-acquired and nosocomial pneumonia as well as developing Clostridium difficile. The economic burden of SUP is significant when considering the inappropriate use as well as the potential risk of developing unintended sequelae. Several studies have found rates over 50% of inappropriate use of SUP with associated costs with inappropriate use. Other costs of concern include continued therapy beyond hospital admission without a clear indication.

Clinical pharmacists at our institution under a collaborative practice agreement have the autonomy to manage SUP. Clinical pharmacists may initiate, modify, or discontinue acid suppression therapy. The purpose of this study is to evaluate the economic impact of a clinical pharmacist-managed stress ulcer prophylaxis program at a large medical center. This study will be a retrospective chart review in adult patients receiving acid suppressive
therapy. Patients over 18 years of age using H2RA or PPI therapy will be included. Patients will be excluded from SUP categorization of acid-suppressive therapy utilization if they have a proper indication for use (chronic out-patient therapy, new ulcer disease and gastritis as defined per institution protocol, high risk patients receiving antiplatelet therapy for acute coronary syndrome as defined per institution protocol). Specific aims are to 1) determine the rate of inappropriate SUP use in non-ICU subject prior to the implementation of a clinical pharmacist-managed program 2) determine the cost-savings of implementing the clinical pharmacist-managed program and 3) determine the rate of inappropriate continuation of SUP therapy in patients on hospital discharge prior to the implementation of the clinical pharmacist-managed program compared to after its implementation. Conclusion and results will be presented.

ACPE #:0126-9999-13-038-L01-P

Learning Objectives:
1. Describe the indications for stress ulcer prophylaxis and considerations for discontinuation.
2. Describe the clinical and economic impact of a clinical pharmacist-managed SUP program.


29 - EFFECTS OF IMPLEMENTING OREGON PRESCRIPTION DRUG MONITORING PROGRAM AT A VETERANS AFFAIRS EMERGENCY DEPARTMENT

A5. Neuro-Psych or Pain Management Agents

Presented by:
Amber Benjamin, PharmD
VA Roseburg Healthcare System
Amber.Benjamin@va.gov

Presenting on Tuesday, May 14 at 8:00 AM in Palm III

Introduction
The Oregon Health Authority implemented the Oregon Prescription Drug Monitoring Program (PDMP) on June 1, 2011 to promote public health and welfare and improve patient care. This program requires all retail and hospital outpatient pharmacies to collect and electronically report data on all scheduled II, III, and IV controlled substances dispensed. Hospital inpatient, veterinarian, and Veterans Affairs (VA) hospital dispensing data are exempt from required reporting.

Methodology
A three month retrospective chart review was completed prior to the initiation of the Oregon PDMP. This will determine a baseline one month average number of patients presenting to the VA Roseburg Healthcare System’s Emergency Department (ED) with complaints of pain and/or requesting opioid(s). This data will be compared to the three month period after implementing the Oregon PDMP. A review will be completed to view the possible reduction of valuable resources and to assure the safe dispensing of opioid medications by ED providers.

Results
In progress

Conclusion
In progress

ACPE #:0126-9999-13-039-L01-P
Learning Objectives:

- Describe the possible barriers of implementing a Prescription Drug Monitoring Program in the VA setting.
- Discuss the effects of the Prescription Drug Monitoring Program on Emergency Department visits.


30 - COMPARISON OF ASTHMA-RELATED EVENTS IN PATIENTS NEWLY PRESCRIBED MOMETASONE/FORMOTEROL OR FLUTICASONE/SALMETEROL
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

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Presenting on Tuesday, May 14 at 3:00 PM in Sunset III

Introduction: Asthma is a chronic disease that causes significant morbidity and has a marked socioeconomic impact. Treatment for patients with moderate to severe persistent asthma typically includes an inhaled corticosteroid plus a long-acting beta-agonist. No data are available to demonstrate whether the choice of inhaled corticosteroid/long-acting beta-agonist combination inhaler influences asthma-related events. This retrospective cohort study will compare the primary outcome of asthma-related events in patients newly started on mometasone furoate/formoterol versus fluticasone propionate/salmeterol.

Methodology: Patients aged 18 to 60 years were included if they initiated mometasone furoate/formoterol or fluticasone propionate/salmeterol from January 2009 through June 2012 and had at least one diagnosis of asthma documented by ICD-9 coding in the six months before the index date, the initial date of prescription. Exclusion criteria were a diagnosis with obstructive pulmonary disease or a prescription within six months of the index date for an inhaled corticosteroid plus a long-acting beta-agonist. Patients were matched using propensity scoring, which is a score generated using covariates such as age, gender, region, comorbid conditions, and prior asthma-related emergency department visits and hospitalizations. The primary outcome was the number of patients in each group experiencing an emergency department visit or hospital admission for an asthma-related cause within six months of index date. Secondary outcomes included the differential rate of prescriptions for oral steroids and the number of short-acting beta-agonist canisters dispensed between the two groups.

Results and conclusion: Among the 18,709 patients, 15,209 received fluticasone propionate/salmeterol, and 3,500 received mometasone furoate/formoterol. The study population was 66.4% female and had a mean age of 42 ± 12 years; 95% of patients had at least 180 days of follow-up data. Further results and conclusion will be presented.

ACPE #:0126-9999-13-040-L01-P

Learning Objectives:

- List asthma-related outcomes in patients prescribed mometasone furoate/formoterol or fluticasone propionate/salmeterol based on retrospective claims data.
- Describe the appropriateness of promoting mometasone furoate/formoterol over fluticasone propionate/salmeterol for new-start patients.

31 - ORGANIZATIONAL SYNERGY: EVALUATION OF A CLINICAL PHARMACY SERVICE MODEL IN A MAIL ORDER CALL CENTER

Presented by:

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Presenting on Tuesday, May 14 at 3:30 PM in Sunset III

Background: The face of health care is constantly changing. New technologies have allowed health care organizations to completely transform the way patients receive care. Kaiser Permanente is at the forefront of this evolution, as the organization leverages cutting-edge technology and an integrated health care model to enhance the delivery of patient care. Kaiser Permanente’s nationwide electronic health record is accessible to the entire multidisciplinary health care team, including pharmacists, working in both traditional and non-traditional settings. A unique advantage for pharmacists at Kaiser Permanente is the ability to virtually access comprehensive patient-specific medical information including the provider’s patient care plan, clinical laboratory values, medication adherence rates, and other significant patient information. This access is also available to pharmacists working remotely in the centralized mail order pharmacy call center. The implementation of a clinical service model based out of the pharmacy call center would provide this expanded service to a population that may not otherwise receive it. This project will focus on the development of a working model to impact outpatient pharmacy practice across the organization, and through organizational synergy, implement a novel clinical pharmacy model into a call center.

Methodology: This study evaluates a pilot program integrating an outpatient pharmacy clinical service model into a mail order pharmacy call center. Key stakeholders were engaged to set objectives and goals for the pilot focused on expanding the role of the call center pharmacist with greater accountability toward patient care outcomes. The first critical component of the study was to determine the elements of the outpatient model that could be successfully integrated into the workflow of the call center. It was necessary to develop several alternative workflows to select the best fit. The next step was to ensure that each pharmacist had access to the electronic health record system to identify patients requiring a medication adherence intervention. Pharmacists were in-serviced on consultation, intervention, and documentation activities required for the pilot. Patients in the study received a one-time telephone consultation with a pharmacist to address medication adherence. During the consultation, the following points were discussed: potential barriers to adherence, patient willingness to restart a specific medication, and completion of any pertinent lab tests. Data from the analysis of each patient consultation were utilized to evaluate the impact on patient care outcomes. Specifically, the study measures the patient response to the consultation as indicated by their willingness to restart medications and/or complete lab tests. The processing of a timely subsequent refill was used as an additional adherence metric. Finally, the study quantifies pharmacist productivity and professional satisfaction.

Results: A summary report of the process and results will be discussed.

ACPE #:0126-9999-13-041-L01-P

Learning Objectives:

To describe the implementation of a new telephone-based clinical pharmacy service into a mail order call center
Cystic fibrosis (CF) is an autosomal recessive disorder affecting multiple organ systems. Dysfunctional cystic fibrosis regulator proteins throughout the pulmonary, hepatobiliary, pancreas, and reproductive systems leads to dehydrated, tenacious secretions, and luminal obstruction with subsequent recurrent infections, chronic inflammation, scarring, and destruction of the aforementioned organ systems. A wide range of medications are utilized on both an acute and chronic basis to manage this disease. Medication regimens include chronic and aerosolized antibiotics, aerosolized mucolytics, pancreatic enzymes, and insulin. Due to the complexity of the disease and medication management, a multi-disciplinary team approach to care is recommended by the Cystic Fibrosis Foundation (CFF) for patients with CF. According to the European Consensus statement and the UK CF Trust Standard on the standards of care for patients with CF, pharmacists are considered primary members of the multi-disciplinary CF care team. Thus pharmacists can be key members of the multi-disciplinary team caring for patients with CF.

In a previous study at Emory University, it was reported that pharmacists were involved in a broad range of patient activities ranging from education to therapeutic drug monitoring. However, this report is only reflective of a single center in the U.S. There are currently 261 CFF-accredited centers (i.e. adult, pediatric, affiliate) in the U.S. Currently, there are no published studies documenting the activities of pharmacists with respect to their involvement in the care for patients with CF at U.S. CFF-accredited centers.

This study utilized a survey to help document the activities of pharmacists and their involvement from a US CFF-accredited center director’s perspective. Center directors were identified via the US CFF database. E-mail contact was made with the directors of each of the CFF-accredited pediatric and/or adult center(s). These individuals were sent the survey via hyperlink to an electronic survey (www.surveymonkey.com) which was completed on-line.

The primary purpose of this study was to assess the role of pharmacist activities at CFF-accredited care centers in the U.S., from the CF center directors perspective. The secondary objectives of the study were to characterize the importance of the pharmacist’s activities; to identify potential barriers in pharmacist provided CF patient care; and to identify areas for improvement on a local and national level with respect to pharmacist provided CF care.

IRB approval was obtained and data collection has been completed. Data analysis is in process and final results will be presented at Western States Conference. Upon completion of the survey we have a response of 106/261 (40.6%), of the CFF-accredited centers who responded. Preliminary analysis shows that physicians, nurses, and dieticians are a core member of CF care team in > 90% of responses. What is interesting is that pharmacist’s were reported to be a core member in only about 57% of the responses. Initial data shows that pharmacists are
involved in some aspect of CF care in about 88% of the institutions that responded, however only 67% of responses indicated that pharmacists were dedicated to providing specific care for just CF patients. Presentation of remaining results will occur once all of the data has been analyzed.

ACPE #:0126-9999-13-042-L01-P

Learning Objectives:
- List the top 4 activities of pharmacists and their involvement, from a US CFF-accredited center director’s perspective.
- List areas and activities where pharmacist’s involvement could be improved or expanded at CFF-accredited care centers.


33 - IMPLEMENTING A PAIN MEDICATION MANAGEMENT CLINIC IN COORDINATION WITH A PAIN SPECIALIST IN A VA AMBULATORY SETTING

B1. Ambulatory Care

Presented by:

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Presenting on Tuesday, May 14 at 10:00 AM in Bay View

The VA Patient Aligned Care Teams consist of multiple interdisciplinary health care professionals working together to provide efficient patient centered care for veterans in the ambulatory setting. Pharmacists continue to expand their roles in these teams across the country with new scopes and areas of practice. For example, Clinical Pharmacy Specialists have been able to utilize their training and gain scopes of practice in managing anticoagulation, hypertension, hyperlipidemia and diabetes. The implementation of these positions and the resulting positive effects on the outcomes for the veterans has helped provide the foundation for continuing the expansion of pharmacy services in the outpatient setting.

Pharmacists continue to expand their scopes of practice in the setting of chronic pain management clinics. Those within the profession possess a wealth of knowledge surrounding the realm of medications used in patients with chronic pain. Individualized and appropriate medication selection, monitoring and managing efficacy and side effects, and providing adequate education and follow-up for chronic pain patients are all important aspects of providing effective care for this population. Pharmacists are well equipped with the knowledge necessary to efficiently apply and execute these skills to benefit the overall prognosis of a patient dealing with chronic pain. Implementing a pilot project covering this type of pharmacy service in a VA Patient Aligned Care Team (Primary care/outpatient) setting would benefit both veterans and their physicians. The purpose of this project is to depict the process of designing, implementing, and executing such a clinic in coordination with a primary care pain specialist at the Spokane VA Medical Center. Secondarily, the reported findings will show whether physicians and patients found benefits in having a pharmacy resident provide assistance in managing chronic pain medications for the veterans. Concerns and possible improvements encountered during the process of running such a clinic will be discussed along with the description of patient encounters and services provided. Results and conclusions of the program will be provided.

ACPE #:0126-9999-13-043-L01-P
Learning Objectives:

Explain the key steps in implementing a pharmacist pain management clinic in the VA PACT setting.
Describe the benefits of the continued expansion of pharmacists’ role in the ambulatory care setting.


34 - THE CLINICAL AND ECONOMIC EFFECTS OF EXPANDING ANTICOAGULATION SERVICES AT SAN JOAQUIN GENERAL HOSPITAL

B1. Ambulatory Care

Presented by:

Roma Bhandarkar, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Bay View

Introduction: San Joaquin General Hospital has a pharmacist-run anticoagulation clinic which manages patients through a combination of phone calls and face-to-face visits. Up until 2010, the clinic only accepted patients whose primary care physician was within the San Joaquin General Hospital provider network and only received payment for face-to-face patient encounters. In order to accommodate the workload of the clinic, the majority of patient encounters are conducted via phone, which represents a significant source of lost income potential. Starting in 2010, the anticoagulation clinic contracted with the Health Plan of San Joaquin to manage their warfarin patients as well, including those patients whose primary care physician is outside the San Joaquin General Hospital provider network. In return for this service, the Health Plan of San Joaquin agreed to provide payment to the clinic for each face-to-face visit as well as each phone call made to a patient regarding their INR results. As a result of this contract, the number of patients being managed through the clinic increased, without a proportional increase in staff coverage.

Purpose: The aim of this study is to assess whether the expansion of services at San Joaquin General Hospital has negatively impacted patient care and if contracting with the Health Plan of San Joaquin has proven economically beneficial.

Methods: All patients being managed through the San Joaquin General Hospital Anticoagulation clinic will be included in this study. The primary outcome of this study will be to determine what percentages of patients, both prior to the contract implementation (October 1st, 2008 – March 31st, 2009) and after (October 1st, 2012 – March 31st, 2013), are within the therapeutic range for INR levels. Data will include the number of patients with INRs ≥5, the number of patients who experienced bleeding events, and the number of patients who experienced thrombotic events. The secondary endpoints will be the number of face-to-face visits as a percent of total clinic interventions and the amount of payment received from Health Plan of San Joaquin by the Anticoagulation clinic.

Results and conclusion will be presented.

ACPE #:0126-9999-13-044-L01-P

Learning Objectives:

Explain the clinical impact of an increased patient load in a clinic in which pharmacy staff did not increase proportionally.
Discuss whether an economic incentive fully justifies an increase in patient load.
Asthma is a growing cause for morbidity, in particular among the Hispanic population in the United States. Suboptimal adherence can lead to considerable worsening of the condition as well as increased healthcare costs. Adherence with asthma medications is less than optimal, measuring approximately 50%. Several factors have been shown to contribute to medication non-adherence in the Hispanic population including low socioeconomic status, low literacy, medication cost, access to care, and language barriers. Community Health Clinic Ole is a Federally Qualified Health Center (FQHC) that provides healthcare to the uninsured and underserved in Napa County, California. Patients are able to obtain medications at minimal cost from the clinic, either via the 340B drug pricing program or patient assistance programs and receive one-on-one consultations from bilingual Spanish-speaking providers. Community Health Clinic Ole reduces medication adherence barriers associated with cost, access to care, and language. Evidence shows enhanced medication adherence among patients with physician or healthcare team support. However, limited evidence is available regarding chronic disease-state medication adherence among Hispanics presenting to a safety net clinic. The purpose of this study is to assess asthma medication adherence rates among two cohorts of Hispanic patients presenting to a safety net community clinic: 1) patients who obtain refills at the clinic through patient assistance and discounted programs and 2) patients who obtain their refills at an outside retail pharmacy. Clinical response to asthma medications is a secondary outcome that will be assessed with asthma control test (ACT) scores. A retrospective electronic chart review was conducted between October 1, 2011 – October 31, 2012. Male or female adult patients ≥18 years of age at Community Health Clinic Ole with a current diagnosis of persistent asthma were included in the study. The following subjects were excluded: individuals with intermittent or seasonal asthma only, exercise-induced asthma only, or mixed asthma/COPD; individuals who have not picked up at least one fill of inhaled corticosteroid in the past one-year; and individuals without active prescriptions for asthma controller medications (e.g. inhaled corticosteroids, long-acting beta2 agonists, leukotriene modifiers, and theophylline). Medication adherence was compared by assessing rates of prescription refills [medication possession rate (MPR) and proportion of days covered (PDC)]. MPR was calculated as the days supply for the fills of medication divided by the time from first fill until the end of the measurement period. PDC was calculated as days supply for each fill of a prescription over the defined time interval. All statistical analyses will be conducted using STATA Release 12. Results and conclusions will be presented.

Learning Objectives:
List common barriers to medication adherence in the underserved Hispanic population.
Describe whether healthcare team support improves adherence rates in the Hispanic population presenting to a safety net community clinic.
36 - EVALUATION OF A CLINICAL PHARMACISTS ROLE IN PAIN MANAGEMENT AT A COMMUNITY HOSPITAL
A5. Neuro-Psych or Pain Management Agents

Presented by:

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Presenting on Tuesday, May 14 at 9:30 AM in Palm III

Background:
It is estimated that in the United States more than 76 million people suffer from pain. Unmanaged pain is associated with longer hospital stays, increased rates of rehospitalizations, lower patient satisfaction scores, and additional outpatient visits. Pain is often very difficult to manage requiring complex medication regimens and constant monitoring. As experts in pharmacology and pharmacokinetics, pharmacists can play a vital role in optimizing pain medication safety and efficacy. At Presbyterian Intercommunity Hospital (PIH) Health, a 450+ bed community hospital, data received from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey demonstrated that our patient’s pain was often not adequately controlled. In September 2011, a four hour pain management in-service was provided to a majority of the nursing staff to improve pain management for patients. Improvements in patient satisfaction were transient. In order to sustain patient satisfaction in regard to pain control, it was felt a collaborative and interdisciplinary approach should be developed and implemented.

Study Objective:
The primary objective of this study was to determine the pharmacists’ baseline competency and comfort level regarding pain management and perform an educational in-service to address any identified deficits. Education topics included multimodal medication regimens along with understanding the pharmacology and pharmacokinetics of the medications. The secondary objectives were to evaluate the impact of physician and pharmacy education on patient pain management and control and to assess the potential value of pharmacists’ contribution to collaboratively manage patient’s pain.

Method:
A survey was used to assess pharmacists’ competency and comfort level on aspects of pain management before and after an educational in-service on the topic was given. Pre and Post education tests and surveys will be compared to evaluate the effectiveness of the educational session. HCAHPS scores of adult inpatients at PIH Health, before and after the implementation of the education classes, will be compared to determine if the secondary objectives were successful. A random survey of nurses and physicians will be taken to determine their perception regarding the current and future impact of pharmacists in pain management.

Results and Conclusion: Will be presented

ACPE #:0126-9999-13-046-L01-P

Learning Objectives:
Discuss the importance of effective pain management on patient care and safety.
Explain the collaborative and interdisciplinary approach of inpatient pain management.
37 - EXPANDING A PHARMACY SERVICE OPPORTUNITY IN AN OUTPATIENT CLINIC
UTILIZING QUALITY IMPROVEMENT STRATEGIES

B1. Ambulatory Care

Presented by:

Amanda Bishop, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Bay View

Introduction:
As health care practice models change, pharmacists continually take on expanded roles in outpatient clinics. At Virginia Mason Medical Center ambulatory pharmacy providers manage numerous complex disease states, including anemia and related darbepoetin and erythropoietin injections. With multiple individuals involved in the visit, flow at each of the seven clinic sites is not consistent and variability among providers has caused delays in service. In order to provide a better patient experience, quality improvement strategies outlined by the Virginia Mason Production System (VMPS) were utilized to create a standard of care that is focused on the patient.

Methodology:
Utilizing VMPS tools, an analysis was done on the current visit process in the three busiest satellite clinics for anemia management. The analysis included time observations, mapping the flow of information between providers, and determining the distance a patient walks within the clinic. Patient visits, scheduled for 20 minutes, lasted anywhere from 17 minutes to over 60 minutes, with up to three room changes in order to complete all necessary tasks. Only 7 to 9 minutes of each visit resulted in direct patient care; the rest of the time consisted of the patient waiting or having to walk to a different location within the clinic. Most common reasons for delay in care were: patient waiting for lab technician to draw blood, interruption in communication between the lab and pharmacist, and waiting for injection staff to become available. In reviewing the current state, it is apparent that all parts of the visit (testing hemoglobin, creating clinic note, and giving injection) can be performed by a pharmacist. Considerations to be taken into account to move in this direction include billing, training, and facilitation of change. A two-day improvement workshop (Kaizen Event) will be held in order to brainstorm innovative changes to further involve the pharmacist, trial potential improvements, and define a new standard of care for this patient population.

Results/Conclusion:
The results of the Kaizen event will be used to create and implement new standard work for anemia management in which the visit is dominantly value-added for the patient and can be completed in 20 minutes. In order to measure if the changes are value-added for the patient, we can measure patient satisfaction and direct patient care time vs. time the patient is waiting or walking. Upon implementation of new standard work, additional reviews and timings will take place for the next 90 days allowing participants to continue improving the process and make additional changes as needed.

ACPE #:0126-9999-13-047-L01-P
Learning Objectives:
  Explain the importance of patient-centered care when delivering health care.
  Describe how utilization of quality improvement tools is used to expand pharmacy services.
38 - ECONOMIC AND PERFORMANCE OUTCOMES OF AN INTERACTIVE MEDICATION THERAPY MANAGEMENT PROGRAM

Presented by:
Alexander Bitting, PharmD
VRx Pharmacy Services
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Presenting on Wednesday, May 15 at 2:30 PM in Sunset II

BACKGROUND: With the release of the 2013 Center for Medicare and Medicaid Services (CMS) requirements for MTM programs, there is now room for MTM to take center stage with its inclusion into CMS’s Display Measures, with the proposal to be moved to the Star Ratings for 2014. According to CMS, MTM is a patient-centric and comprehensive approach to improve medication use, reduce risk of adverse events, and improve medication adherence. Comprehensive Medication Reviews (CMR) are the standard of care designated by CMS, with national average CMR completion rates of less than 10%. In order to ensure CMS compliance, health plans are now seeking more definitive outcomes data to improve quality and provide savings opportunities.

RESEARCH OBJECTIVE: To demonstrate the economic and performance outcomes recognized from an interactive MTM program of a large health plan.

METHODS: A group of 2,893 patients who were eligible for a CMR during 2011 were analyzed. Eligible patients were contacted via telephone by a pharmacist/student pharmacist team. Results of the CMR, including pharmacist recommendations were mailed to the patient and provider. Recommendation acceptance rates were calculated by comparing recommendations made during the CMR to prescription claims data. Direct drug expenditure (DDE) and direct medical expenditure (DME) savings were calculated from 2 time periods: January through December 2010, and January through December 2011. Patients who were MTM eligible were stratified into an intervention group (CMR completed) or control group (CMR not completed). Student t-tests were used to detect statistical differences in DDE and DME between study groups. Return on investment (ROI) was calculated using prescription claims, medical claims, and the MTM service billing data.

RESULTS: The CMR completion rate for MTM eligibles in 2011 was 38.1% (n=1,103). When contacted telephonically, approximately 90% of patients opted to participate in the CMR. The acceptance rate of recommendations identified during the CMR was 82.6%. Average annual DDE savings was $1,192 and average annual DME savings was $1,519 for MTM eligibles who received a CMR compared to those who did not (P=0.001 and P<0.001 respectively). Total annual ROI was 1:12.8 for MTM services provided in 2011.

CONCLUSIONS: Telephonic MTM services using a pharmacist/student pharmacist model provides significant savings for patients who received a CMR compared to those who did not. The MTM program also provided a significant ROI for the health plan, which was validated by the internal actuary department. Results of this research confirm the notion that MTM services significantly decreases overall health care expenditures. A potential limitation to the study is that the health plan switched PBMs in 2011; however, this variable was accounted for by comparing trends in DDE in both study groups between the two study periods (2010 and 2011). Future research and observations will be required to determine the long-term impact upon the economic outcomes of the MTM program.

ACPE #:0126-9999-13-048-L04-P
Learning Objectives:
Discuss the current requirements and expectations for MTM programs of the Center for Medicare and Medicaid Services (CMS) for the 2013 Contract Year.
Describe the economic and performance outcomes of a telephonic MTM service provided by a student pharmacist-staffed program.


39 - THE CLINICAL AND FINANCIAL IMPACT OF IMPLEMENTING A MEDICATION ASSISTANCE VOUCHER PROGRAM UNDER THE 340B DRUG PRICING PROGRAM
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
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Presenting on Tuesday, May 14 at 4:00 PM in Sunset III

Introduction: A medication assistance voucher program (MAVP) was established at the Merrill Gappmayer Family Medicine Clinic and the Diabetes Management Clinic at Utah Valley Regional Medical Center (UVRMC). This program was funded with savings realized by UVRMC through the 340B drug pricing program.

Methodology: Patients’ HbA1c were recorded at baseline prior to enrolling in the MAVP and again three months after enrolling in the MAVP. This data was collected by the clinical pharmacists working at the Merrill Gappmayer Family Medicine Clinic and Diabetes Management Clinic. Financial data was tracked through our affiliated pharmacy, Timpview Pharmacy. We tracked the total cost of the MAVP program to UVRMC and the total savings realized by our patients utilizing the 340B medication assistance voucher program.

We analyzed the mean, median, and mode of patient’s HbA1c. Comparisons between baseline and patient outcomes after using the MAVP will be done using a student’s t-test to determine what effect implementing a MAVP has on patients’ HbA1c.

Results: Results are not available at the time of this writing. Outcomes of implementing a MAVP and the effects on patients’ HbA1c will be discussed along with the financial implications for the patient and the institution.

ACPE #:0126-9999-13-049-L04-P
Learning Objectives:
Describe the effects implementing a medication assistance voucher program has on patients’ HbA1c.
Explain the financial impact that implementing a medication assistance voucher program has on patients who use the program as well as the institution that funds the program.


40 - IMPACT OF PHARMACIST-PROVIDED COMPREHENSIVE MEDICATION MANAGEMENT AMONG PATIENTS WITH MENTAL ILLNESS
B1. Ambulatory Care
Introduction:
Multiple reviews have demonstrated improvement in clinical outcomes through pharmacist-delivered comprehensive medication management. Comprehensive medication management (CMM) optimizes medication regimens and reduces drug therapy problems. Including pharmacists in the process of improving the delivery of healthcare is an effective utilization of team-based care. Compared to other chronic medical conditions, there is limited research in providing comprehensive medication management for patients with mental illness. The objective of this research was to assess patient outcomes of a novel pharmacist-provided comprehensive medication management service among patients with mental illness at an outpatient behavioral health center.

Methods:
Adult patients (≥18 years of age) who were referred by a psychiatric provider and who were taking ≥1 scheduled psychiatric medication and ≥1 non-psychiatric medication were eligible for the study. Exclusion criteria consisted of pregnancy or lactation, non-English as the primarily language, acute psychosis, and patients who did not concurrently receive their primary medical care at the organization where the study was carried out. The CMM clinic was staffed by the principal investigator, a pharmacist, one half-day each week, during the period of November 2012 through April 2013. Patients had to complete an initial visit and at least one follow-up visit to be considered evaluable. Once patient eligibility was confirmed by the pharmacist, informed, written consent to participate in the study was obtained and the following data was collected: patient demographics, a full medication history, social history, and patient-reported adverse events to medications. A comprehensive review of each patient’s medications was performed to look for actual and potential drug therapy problems (DTPs). As part of the review, a drug interaction screen was also conducted. If problems were identified, then recommendations were reviewed and approved by a second pharmacist co-investigator. The final summary of recommendations was then electronically sent to the psychiatric and other provider(s). Patient education was provided, and a copy of the recommendation(s) was also mailed to or discussed with the patient once they were accepted by the provider(s). The primary outcome was the number of DTPs identified. DTPs were categorized by appropriateness, effectiveness, safety, and adherence. Secondary outcomes included recommendation acceptance rate, rate and type(s) of severe drug interactions, estimated cost savings from DTPs avoided, as well as patient and provider satisfaction.

Results and Conclusions:
These will be presented.

ACPE #:0126-9999-13-050-L01-P
Learning Objectives:
Describe methods by which comprehensive medication management can be integrated into an outpatient behavioral health center.
Explain the benefits of a pharmacist-provided comprehensive medication management clinic in patients with mental illness.

41 - TESTING STERILITY OF SINGLE USE VIALS OF BEVACIZUMAB AND CETUXIMAB AFTER ENTRY WITH PHASEAL® CLOSED SYSTEM TRANSFER DEVICE

Introduction: The United States Pharmacopeia (USP) Chapter <797> provides guidance and strict compliance requirements that a pharmacist must follow when compounding sterile preparations and assigning beyond use dating to those products. Although several medications have proven an extended period of stability through the proper analytical techniques, data regarding sterility are often missing from the literature. This study will investigate the sterility of two medications, bevacizumab and cetuximab, past their current published beyond use date. This study is unique in that it will employ the use of a closed system transfer device to attempt to prevent the infiltration of microbial contaminants. With a possible added level of safety, a high rate of success is expected in extending the sterility of single use medication vials once they have been entered or manipulated. Extended beyond use dating could reduce waste, decrease pharmaceutical costs, and facilitate the efficient use of stock in the face of a drug shortage.

Study Design: Sterility testing of bevacizumab and cetuximab vials after entry with the PhaSeal® closed system transfer device.

Methods: Sterility testing will employ methods set forth by USP Chapter <71> to assess the sterility of each drug at several time points between the time of vial entry and their respective maximum proven chemical stability times (28 days for bevacizumab and 14 days for cetuximab). The preservative free vials of bevacizumab and cetuximab will be entered and stored utilizing the PhaSeal® device. Tryptic soy broth agar plates and fluid thioglycollate broth vials will be inoculated with sample drug drawn from the single-use vials at established time points. The growth media will be appropriately incubated and assessed for microbial growth.

Results and Conclusion are not yet available.

The views expressed in this abstract are those of the author and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

ACPE #:0126-9999-13-077-L01-P

Learning Objectives:
- Explain challenges and requirements in extending beyond use dating of a compounded sterile product.
- Describe the role of a closed system transfer device in preventing the entry of contaminants into a preservative free vial once it is manipulated.


42 - OUT-OF-PLAN PHARMACY USE BY HEALTH MAINTENANCE ORGANIZATION MEMBERS

B2. Community Practice

Presented by:
Objective: Managed care organization (MCO) members are often required to utilize in-plan pharmacies to receive subsidized prescription medications. The introduction of bargain generic prescription programs has provided MCO members with the option to purchase medications at out-of-plan pharmacies (OOPP) in order to obtain prescription medications at a potentially lower cost. Healthcare delivery including patient safety and the accuracy of quality measure data reporting may be impacted by OOPP use. However, information on if and where a prescription to an OOPP is ever filled and reasons why a member would choose to use an OOPP have not yet been described. The objective of this study was to describe if and where prescriptions written to an OOPP were filled, along with attitudes, beliefs, and preferences for OOPP use of MCO members who had a prescription written to an OOPP. This study will provide baseline information on OOPP use that may be used to develop an intervention to recapture OOPP users back into in-plan pharmacies.

Methods: This was a cross-sectional study of adult Kaiser Permanente Colorado (KPCO) patients who had a prescription written to an OOPP in November 2012. A random sample of 1000 such KPCO patients were invited to participate in a 12-item mail survey. The survey was performed during February 2013 and included questions regarding perceptions of OOPPs, health perceptions, and ability to afford prescription medications. A reminder postcard was mailed to non-responders approximately two weeks after the initial survey mailing. Patient demographic and clinical information was obtained from electronic queries of medical and pharmacy records. Differences between final responders and non-responders were examined. Responses to the survey were tabulated and reported as percentages and means/medians. Differences between responses were assessed based on patient and medication characteristics using chi-square tests of association and t-tests, as appropriate.

Results: A total of 4177 patients with a prescription written to an OOPP in November 2012 were eligible for the survey. As of Feb 13 2013, 271 (27.1%) surveys had been returned. Preliminary results will be presented.

Conclusion: The rate of change of OOPP use at KPCO has remained relatively stable in recent years. Describing this patient population that continues to utilize OOPP is an important step in identifying opportunities to improve patient safety, healthcare quality and MCO member satisfaction.

ACPE #:0126-9999-13-051-L04-P

Learning Objectives:
- List advantages and disadvantages for out-of-plan pharmacy use among members of a managed care organization.
- Describe common attitudes, beliefs and preferences of managed care organization members who utilize out-of-plan pharmacies.


43 - ASSESSING THE APPROPRIATENESS OF INSULIN GLARGINE USE IN TYPE 2 DIABETICS IN A PRIMARY CARE CLINIC

Presented by:

Christina Bockman, PharmD
UW Medicine
Background: Harborview’s Family Medicine Clinic has around 2,500 patients that it treats annually, approximately 300 of which receive diabetes care by one of the providers in the clinic. Meta-analyses comparing the long-acting analogues to NPH in patients with type 2 diabetes have consistently shown no difference in A1C and fail to show an increased benefit of the long-acting agents in reducing morbidity and mortality outcomes. It is standard practice at the Adult Medicine Clinic for providers to start patients on neutral protamine Hagedorn (NPH) insulin prior to starting glargine insulin, as there is no difference in efficacy, minimal safety difference but significant cost differences.

Objectives: The primary objective of this study is to quantify the percentage of patients appropriately prescribed insulin glargine at Harborview’s Family Medicine Clinic. Secondary measures include identifying the type of provider more likely to initiate glargine prescriptions, with the intent on providing education on which agent, NPH versus glargine, is more appropriate in certain populations and considerations to be aware of when prescribing one versus the other.

Methods: A retrospective chart review of eligible Family Medicine Clinic patients that received a prescription for insulin glargine between September 13, 2011 to September 12, 2012 was conducted. Appropriateness of glargine initiation was pre-defined as: patient having tried NPH or 70/30 insulin which resulted in an unacceptable hypoglycemic event (blood glucose of less than 50-70mg/dL with symptoms such as diaphoresis, shakiness, heart palpitations as identified by prescriber) or patient non-adherent to twice daily NPH or 70/30 insulin regimen. Patients were excluded if they had type 1 diabetes, were pregnant or had gestational diabetes.

Results and Conclusion: A total of 77 patients were identified as receiving insulin glargine at some point during the above study period. Additional data will be presented.

ACPE #:0126-9999-13-052-L01-P

Learning Objectives:
- Describe the efficacy, safety and cost differences of insulin glargine and insulin neutral protamine Hagedorn
- Explain why NPH may be a better therapeutic insulin option in the general patient population.


44 - COST-COMPARISON ANALYSIS OF BENDAMUSTINE/RITUXIMAB/ETOPOSIDE/CARBOPLATIN VS. CONVENTIONAL CARE IN RELAPSED LYMPHOMA
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
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Presenting on Tuesday, May 14 at 4:30 PM in Sunset III
Patients with lymphoma relapsing after anthracycline-based first line therapies fare poorly when given traditional salvage regimens such as rituximab/ifosfamide/carboplatin/etoposide (RICE) and rituximab/dexamethasone/cisplatin/cytarabine (R-DHAP). Furthermore, these regimens are administered in the inpatient setting and may cause significant toxicities. Preliminary results from a Phase I study at this author’s institution describe the safe use and encouraging response data of the regimen bendamustine/rituximab/etoposide/carboplatin (TREC) in patients with refractory or relapsed lymphoma. The TREC regimen is administered in the outpatient setting which may confer cost savings compared to inpatient regimens. The primary goal of this study is to compare costs of the Phase I TREC regimen to standard salvage regimens of RICE or R-DHAP from a US healthcare payer perspective. Secondary objectives include a cost-consequence analysis comparing regimen costs to difference in response rates between the regimens.

Methodology:
Retrospective cost data was collected on 15 patients who were treated with at least one cycle of TREC in the Phase I trial, and 40 patients treated at the University of Washington Medical Center with either RICE or R-DHAP between July 2010 to July 2012. A cost-comparison analysis will be conducted detailing total costs of the outpatient or inpatient admission as well as specific drug and administration costs. A cost-consequence analysis is planned to compare costs of each regimen to efficacy results by using the preliminary response rates from the Phase I trial as well as response rates reported in the literature of RICE and R-DHAP. Secondary outcomes regarding regimen tolerability may also be reported.

Results and Conclusion:
Detailed analysis, results, and conclusion to be presented.

ACPE #:0126-9999-13-053-L01-P

Learning Objectives:
- Describe the cost difference between the outpatient administered TREC regimen and the inpatient administered RICE or R-DHAP regimens.
- Explain the results of the cost-consequence analysis comparing costs of the TREC regimen vs. the conventional RICE or R-DHAP regimens.


45 - PHARMACIST MANAGED CARE OF DIABETES, HYPERTENSION AND HYPERLIPIDEMIA WITHIN PATIENT ALIGNED CARE TEAMS
B1. Ambulatory Care

Presented by:
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Presenting on Tuesday, May 14 at 2:30 PM in Bay View

Introduction:
Current literature supports the incorporation of clinical pharmacy specialists into the primary care team for the management of diabetes, hypertension and hyperlipidemia. The objective of this study is to describe the impact of pharmacy involvement on monitoring parameters of patients enrolled within the pharmacy patient aligned care teams (PACT) at the VA Southern Nevada Healthcare Systems (VASHS). Monitoring parameters will include glycosylated hemoglobin A1c, blood pressure and cholesterol levels. The potential benefit of this study is
to support the implementation of pharmacist-run diabetes, hypertension and hyperlipidemia clinics within VA primary care settings.

Methodology:
The Institutional Review Board has approved this retrospective chart review. This study will retrieve data from the Veteran Affairs electronic medical records. All patients enrolled in the Pharmacy PACT program at the VASNHS from initiation of the program in February 2012 to November 30th, 2012 with at least one follow-up consultation including lab or blood pressure records will be included in the study. Lab data will be collected for actively enrolled patients through February 15th, 2013. Patient demographics will include patient age, gender, pharmacy clinic in which the patient was seen, tobacco, alcohol-use and body mass index upon enrollment. All patients will also be evaluated for the referral for weight loss or nutrition consults, the number and type of encounters within Pharmacy PACT and the recommendation for influenza vaccine. Laboratory data at enrollment and final consult will be collected as relevant to the disease state managed which may include: hemoglobin A1c, lipid panel and blood pressure. Patients being consulted for diabetes will also be evaluated for recommendations for: pneumonia vaccine, angiotensin converting enzyme inhibitor or angiotensin receptor blocker and aspirin. Additionally, the number and a description of reported hypoglycemic episodes will be collected. Continuous data will be analyzed using a paired-samples t-test. Results of the t-test will compare lab values at enrollment to values recorded at the final consultation or latest follow-up consultation.

Results and Conclusion: Three hundred and twenty-four veterans were enrolled within Pharmacy PACT clinic between February 2012 to November 2012. Results will be reported upon completion of the study.

ACPE #:0126-9999-13-054-L01-P
Learning Objectives:
- Explain the role of clinical pharmacists within Patient Aligned Care Teams.
- Describe the impact of a pharmacist’s management of diabetes, hypertension and hyperlipidemia on patient outcomes in an outpatient setting.


46 - THE INCIDENCE OF VENOUS THROMBOEMBOLISM IN HOSPITALIZED CIRRHOTIC PATIENTS AND PHARMACOLOGIC PROPHYLAXIS.
B4. General Clinical Practice

Presented by:
HANIN BOGARI, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Royal II

Introduction: Despite the endogenous coagulopathy of cirrhosis, some patients do experience thrombophilic states. The lack of specific guidelines in using pharmacologic prophylaxis is because of the perceived risk of bleeding complications, sense of auto-anticoagulation, impaired laboratory tests, and most important lack of clinical trials to support the practice of routine use of deep vein thrombosis (DVT) prophylaxis in liver disease/cirrhosis and its safety, particularly the risk of bleeding is controversial. Objectives: The aim of this project is to describe the incidence of venous thromboembolism (VTE) and the use of pharmacological DVT prophylaxis among hospitalized patients with chronic liver disease. Methodology: This project will be submitted to the Institutional Review Board (IRB) for approval. A retrospective study will be performed at a tertiary
university hospital; a clinical pharmacist will identify adult patients admitted with chronic liver disease over three year period using electronic data base. Baseline data to be collected and evaluated includes patient demographics, INR levels, serum albumin levels, and length of hospital stay. The primary outcome is the development of VTE during hospital stay or within 30-days of discharge. Secondary outcome is treatment complication. Results and conclusions will be presented.

ACPE #:0126-9999-13-055-L01-P

Learning Objectives:

- Describe the incidence of deep vein thrombosis and pulmonary embolism in hospitalized chronic liver disease patients.
- Explain the clinical markers predecting the risk of venous thromboembolism.


**47 - FEBRILE NEUTROPENIA IN PATIENTS WITH BREAST CANCER RECEIVING DOCETAXEL, CARBOPLATIN, AND TRASTUZUMAB ADJUVANT THERAPY**

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

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**Presenting on Tuesday, May 14 at 8:30 AM in Sunset I**

Febrile neutropenia is a major adverse effect of many chemotherapy regimens that can lead to subsequent chemotherapy delays, dose reductions, prolonged hospitalization, use of broad-spectrum antibiotics, and possibly death. Studies have shown that primary prophylaxis with hematopoietic growth factors against febrile neutropenia can reduce the risk, severity and duration of febrile neutropenia. Routine use of growth factors in all patients receiving myelosuppressive chemotherapy is not common practice largely due to cost of the growth factors. The National Comprehensive Cancer Network (NCCN) recommends giving hematopoietic growth factors on the first cycle when giving a chemotherapy regimen that has a febrile neutropenia rate of at least 20%. The incidence of febrile neutropenia and use of primary prophylactic hematopoietic growth factors in patients receiving treatment with docetaxel, carboplatin, and trastuzumab (TCH) is highly variable among reported trials. There has been increasing concern among the breast cancer team at the Huntsman Cancer Institute (HCI) regarding higher than reported rates of febrile neutropenia with TCH. Standard practice at HCI does not include the use of primary prophylaxis with hematopoietic growth factors with TCH.

The primary objective of this study is to describe the prevalence of febrile neutropenia in patients receiving TCH for adjuvant treatment of HER2 positive breast cancer without primary prophylaxis. Quantifying the prevalence of febrile neutropenia in patients receiving TCH for adjuvant treatment of HER2 positive breast cancer will provide information to support or refute the need to provide primary prophylaxis with hematopoietic growth factors. Secondary objectives of this study are to contrast the prevalence of febrile neutropenia in patients receiving TCH with and without primary prophylaxis, determine if there is a demographic difference in patients with or without primary prophylaxis with TCH at HCI, to determine the rate of hospitalization for febrile neutropenia with TCH and quantify subsequent lengths of stay, determine if there is a difference in demographics of patients receiving TCH at HCI compared to the demographics of patients in published data for TCH and evaluate if these differences may influence rates of febrile neutropenia.
This study is a retrospective cohort comparison of patients with a diagnosis of HER2 positive breast cancer age 18 years and older treated with TCH at the HCI from January 1, 2006 to December 31, 2012. Results and conclusions will be presented upon the completion of data collection and analysis.

ACPE #:0126-9999-13-056-L01-P
Learning Objectives:
- Describe the prevalence of febrile neutropenia in patients with HER2 positive breast cancer receiving docetaxel, carboplatin, and trastuzumab for adjuvant therapy
- Describe the use of hematopoietic growth factors as primary prophylaxis against febrile neutropenia in patients with HER2 positive breast cancer receiving docetaxel, carboplatin, and trastuzumab for adjuvant therapy


48 - HOSPITALIZATIONS AND ED VISITS AT A LARGE MEDICAL CENTER FOR PATIENTS ON HEPATITIS C VIRUS PROTEASE INHIBITOR THERAPY
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Tuesday, May 14 at 11:00 AM in Dockside

Chronic hepatitis C virus (HCV) infection is the most common cause of hepatocellular carcinoma and liver transplantation in the United States. The nonstructural protein 3 serine protease inhibitors, boceprevir and telaprevir, were approved in May 2011 to be used in combination with pegylated interferon and ribavirin in the treatment of chronic HCV genotype 1 infection. Triple-therapy is indicated for patients who are treatment-naive or who have failed previous dual therapy with pegylated interferon and ribavirin. The major adverse effects associated with these agents include nausea and vomiting, anemia, skin rash, neutropenia, and anal pain and irritation, which can range in severity and may potentially result in visits to the emergency department (ED) or hospitalizations. The study is a retrospective analysis evaluating the incidence of and reasons for hospital admission and visits to the ED in patients taking these medications.

Patients were included if they were being treated at University of Colorado Hospital (UCH) Hepatology or Infectious Disease clinics with an HCV protease inhibitor and had a documented UCH hospital admission or ED visit between May 31, 2011 to November 31, 2012. The primary outcome of this study is to determine the incidence of hospitalization or ED visits in patients with chronic HCV infection treated within a UCH clinic. Secondarily, the primary cause and patterns of hospital admission and ED visits will be identified.

ACPE #:0126-9999-13-057-L01-P
Learning Objectives:
- List potential complications of therapy with hepatitis C virus protease inhibitors
- Describe patient characteristics that may put a person at risk for complications from therapy with hepatitis C virus protease inhibitors

Introduction: Cardiovascular surgery represents a well-defined but complex homeostatic challenge due to multiple factors including tissue injury, heparin use, and pre-existing drug therapy. The use of cardio-pulmonary bypass (CPB), continuous flow devices (CFD), and massive blood product infusions further complicate hemostasis. In addition to the provision of blood products strategies to control blood loss involve the use of numerous hemostatic agents, some of which have been shown to cause significant morbidity. The primary objective of this study is to determine the safety of PCC vs. non-PCC use in cardiovascular surgery: VAD insertion, defined as the incidence of clinically detectable thromboembolic events.

Methodology: This study will be submitted to the Institutional Review Board (IRB) for approval prior to initiation. The cardiovascular surgery department operative records will be accessed to identify a study group of patients who underwent VAD insertion and received intra-operative PCC during the time period from January 1, 2010 to October 1, 2012. The study group will be compared to a historical cohort of similar control patients who underwent VAD insertion and did not receive PCC during the same time period. Patients, who are identified to have inherited coagulopathies or hemophilia A and/or B, will be excluded. A retrospective review of the institution operative reports and electronic medical records will be utilized to collect the following de-identified data to maintain patient confidentiality: patient demographics (age, gender, ethnicity, height, weight, diagnosis, type of VAD insertion), past medical history (diabetes, smoking status, previous sternotomy, pre-operative medications), pertinent laboratory data (Scr, BUN, AST, ALT, ALP, Bilirubin, Hgb, Hct, Plt, aPTT, PT/INR), total times (operative, CPB, mechanical ventilation, ICU and hospital length of stay), blood product use (intra and post-operative), occurrence of thromboembolic events (post-operative, at 1 month, at 3 months), morbidity at discharge (renal failure, liver failure, respiratory failure, infection), and 30-day post-operative mortality.

Results and Conclusions: Will be presented.

ACPE #:0126-9999-13-058-L01-P

Learning Objectives:
- Describe the risks and benefits associated with the use of traditional blood product transfusions (ie: PRBC, FFP, Platelets, etc.) in the restoration of hemostasis.
- Explain the rational for PCC use in the management of perioperative bleeding in cardiovascular surgery patients.

50 - DEFINING THE IMPACT OF A CENTRAL FILL PHARMACY ON OUTPATIENT PHARMACIES IN AN INTEGRATED DELIVERY NETWORK USING A TIME AND MOTION METHODOLOGY

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Jason Braithwaite, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Sunset III

Introduction
As payers provide lower reimbursement for care provided, life expectancy continues to increase, and the number of chronic conditions per patient climbs, health care organizations must find ways to decrease the cost of care, improve patient education, and provide alternatives to the way care is delivered. Studies have found that a majority of pharmacist time is spent preparing prescription medication for dispensing and only a small fraction of their time is actually spent counseling and educating the patient. By centralizing prescription filling tasks, we hope to provide more time for educational interactions between our pharmacists and their patients.

This study is designed with the intent to define the time required to perform the fill, verify, and package steps of prescription preparation. This time will then be used in a workload reduction forecast to determine the amount of work (measured in time) that our new central fill pharmacy will liberate to allow our clinic-based pharmacies to provide counseling and clinical services that are not currently offered.

A. Inclusion criteria
• Intermountain Healthcare outpatient pharmacies located in clinic settings.
• Three clinic-based pharmacies with similar geography, structure, staffing, and availability of services.

B. Exclusion criteria
• Structural building changes
• Significant staffing changes
• New service implementations
• Weekends, holidays

Methodology
Prospective, observational, time-motion analysis of outpatient pharmacies within an integrated delivery network.
A clinical pharmacist with a team of pharmacy interns and technicians will spend two, 4-hour days in three different pharmacies observing and recording all primary and secondary measures. To minimize the variation in prescription volumes that occur day-to-day, the time-motion studies will occur on the same day of the week. The studies will also use two standard times to measure: 9 am to 1 pm, and 2 pm to 6 pm.

The team will utilize a workflow observation worksheet and time individual tasks using a timing device to capture the individual tasks of fill, verify and package.

Primary Outcome
The primary outcome of the study is to determine the mean fill, verify, and package time of each prescription medication.

Secondary Outcomes
• Mean fill time
• Mean verify time
• Mean package time
• Proportion of prescriptions filled by a pharmacist vs technician
• Variance between sites for each secondary measure
• Workload reduction forecast
• Description of the pharmacy location, services provided, hours of operation, FTE during observation, and prescriptions filled during observation.

Results
Data collection is underway and results will be presented at Western States Conference (See primary and secondary outcomes)

Conclusion
The workload reduction forecast will allow our organization, as well as others interested in implementing central fill pharmacy, to determine the impact of a central fill pharmacy. The workload reduction determination will allow organizations to determine the amount of time they will have to implement new clinical services or reduce staff if they so choose.

ACPE #:0126-9999-13-059-L04-P

Learning Objectives:
- Explain the purpose of using time and motion methodology to determine the time required to fill, verify, and package prescription medications.
- Describe the reduction in workload of clinic-based pharmacies that is expected to result from the implementation of a central fill pharmacy.


### 51 - THE PREVALENCE OF INCORRECT OR INADEQUATE ASSESSMENTS OF BETA LACTAM (BL) ALLERGIES IN A VETERAN POPULATION

A1. Infectious Disease - Anti-infective Agents

Presented by:

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**Presenting on Tuesday, May 14 at 11:30 AM in Dockside**

**INTRODUCTION:** Many veterans received penicillin shots as a pre-requisite to service. As a result, many veterans have reported allergies to penicillin, which have perhaps been reported inaccurately or inadequately. Independent of any exposure to penicillin shots, documented allergies may be inaccurate or inadequate for various reasons. Proper assessment and documentation of allergies particularly to beta lactams, a first-line class of antibiotics for many infections, is essential to ensure optimal care to veterans. Proper beta lactam allergy assessment and documentation not only ensures appropriate antibiotic use and optimal care to each individual veteran, but also to the local population of veterans, because appropriate antibiotic use reduces antibiotic resistance within a population. It also reduces healthcare costs.

**METHODOLOGY:** In an observational retrospective chart review, patients with documented allergies or adverse drug reactions to beta-lactam antibiotics in the New Mexico Veterans Affairs Health Care System were identified in VISTA, and 200 of them were randomly included. Deceased veterans were excluded. Patients’ charts were reviewed for accuracy and adequacy of documentation related to the allergy assessment. Demographics, details
within the allergy documentation, and antibiotic history were recorded during the review. After review, patients were classified outside of their health records as having a ‘definite allergy’, ‘undetermined allergy’, ‘unlikely allergy’, or ‘incorrect allergy’, per pre-defined criteria. No changes to allergy assessments within the patients’ records were made during this review.

RESULTS: To be reported.
CONCLUSIONS: To be reported.

ACPE #:0126-9999-13-060-L01-P

Learning Objectives:
- Describe the prevalence and quality of documented beta-lactam allergies within a local VA Health Care System veteran population.
- List potential areas for improvement in allergy documentation strategies/processes related to beta-lactam antibiotics.


52 - MANAGING THE PAIN OF OPIOID CONVERSIONS: DEVELOPMENT OF A CALCULATOR FOR PHARMACISTS

A5. Neuro-Psych or Pain Management Agents

Presented by:

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Presenting on Tuesday, May 14 at 9:00 AM in Palm III

BACKGROUND: In August 2012, the Joint Commission (TJC) published a Sentinel Event Alert regarding safe use of opioids that are prescribed and administered within the inpatient hospital setting. According to this statement, of the opioid-related adverse drug events that were reported to TJC’s Sentinel Event database from 2004-2011, 47 percent were wrong dose medication errors and another 11 percent included factors such as excessive dosing, medication interactions and adverse drug reactions. As part of their recommendations, TJC recommends consulting a pharmacist and using “conversion support systems to calculate correct doses of opioids to help prevent problems with conversions from oral, IV and transdermal routes of administration.”

OBJECTIVE: The primary objective of this study is to generate, validate and establish an opioid conversion calculator at Scripps Memorial Hospital La Jolla and to analyze its value and significance. Secondary objectives include determination of time savings and reduction in error rate using the calculator versus manual calculations.

METHODS: Validation of the calculator will be performed by comparing the results of 100 opioid conversions done using manual calculations versus the calculator. Pharmacists will be asked to perform several opioid conversion calculations by hand (PRE), and then using the calculator (POST). PRE and POST results will be compared for accuracy of calculations, as well as for time required to complete the calculations. Finally, pharmacists will be asked to complete a short survey to assess comfort with opioid conversion calculations and satisfaction before (PRE-survey) and after (POST-survey) development of the calculator. There will be no patient contact or medication intervention from the investigators of this study. Results will be presented.
CONCLUSION: The findings of this study will be presented after completion. This study has the potential to reduce error rate and time spent when performing complex opioid conversions. The final calculator also has the potential for dissemination throughout the Scripps hospital system.

ACPE #:0126-9999-13-061-L01-P
Learning Objectives:
1. Identify strategies for safe use of opioids in the inpatient hospital setting.
2. Describe how the use of a novel opioid conversion calculator can increase safety and efficiency of opioid conversions by pharmacists.


53 - EVALUATION OF OUTCOMES AFTER AMBULATORY CARE PHARMACIST INTERVENTIONS IN A MULTIDISCIPLINARY TRANSITIONAL CARE PROGRAM
B1. Ambulatory Care

Presented by:
Laura Bronzan, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Bay View

Introduction: Studies have shown that upon hospital discharge to home, patients frequently have problems understanding their medications and how to take them appropriately. These medication related problems can often lead to non-compliance and hospital readmission. With the implementation of Transitional Care Pharmacy (TCP) services, patients are given a comprehensive medication review, medication reconciliation, education about necessary follow-up appointments, and laboratory exams upon hospital discharge to home. Pharmacists working under the TCP protocol in collaboration with physicians and nurses perform functions such as medication optimization, the ordering of follow-up labs, and the provision of anticoagulation dosing and education. This study was designed to further examine the impact a TCP service has on readmission rates and to determine the effects the service has on medication adherence post discharge to home.

Methodology: A matched-cohort study was conducted to evaluate the readmission rates for those who received the TCP service during the months of July 2010 through December 2012. A matched-cohort was identified from patients discharged from the same medical center during the years 2008 to 2012. They were matched on age, gender, and diagnosis-related group (DRG). Patients discharged to a skilled nursing facility, those discharged into hospice care, and outpatient surgery discharges were all excluded from the study. The primary objective of the analysis was to determine whether patients were readmitted within seven and 30 days. Chart reviews were conducted on these readmitted cases to determine if the new admission had a diagnosis related to the initial hospital admission. The secondary outcome of the study was to determine if there were differences in adherence to chronic medications post hospital discharge.

Results: A total of 2342 patients who received the Transitional Care Pharmacy Services were included as the study group and a matched control group was identified. The mean ages were 68.5 +/- 15.1 and 55.6% of the patients were female. An analysis of the results will be discussed.

ACPE #:0126-9999-13-062-L01-P
Learning Objectives:
Explain Transitional Care Pharmacy’s impact on 7 and 30-day hospital readmission based on readmission diagnosis.
Explain the effect TCP has on medication adherence.


54 - VERIFICATION OF BENEFITS FOR CLINIC AND INFUSION MEDICATION ADMINISTRATION
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
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Presenting on Wednesday, May 15 at 8:30 AM in Sunset III

Reimbursement for administering or infusing medications in the clinic setting is becoming increasingly complicated by factors such as prior authorizations and payment sources. Verification of benefits is a vital, but difficult step in ensuring payment because of these complications. Reviewing the order writing process, documentation gathering, and payment verification can help identify inconsistencies in the workflow between clinics and providers. If a medication is denied and is not identified upfront, it may be given repeatedly resulting in continued loss of payment and unknown financial burden. Analyzing the current process of verifying reimbursement for medications given in the ambulatory setting and identifying areas of improvement in that process can be financially beneficial.

This quality improvement study will evaluate the current prior authorization and reimbursement process. Its impact on preventing denials of medications administered or infused in the clinic setting will establish a baseline for improving financial performance including increased payment and decreased accounts receivable days. That information will be used to identify areas of improvement that can be changed to enhance reimbursement. The University of Utah Hospitals and Clinics (UUHC), including the University of Utah Hospital and Huntsman Cancer Institute, has 10 community clinics, 3 infusion centers, and 1 home infusion group. UUHC spends nearly 30 million dollars a year on medications administered in those clinics or infusion centers. The 11 highest cost medications at the Huntsman Cancer Institute infusion center and the 10 highest cost medications at the UUHC non-oncology outpatient clinics and infusion centers will be assessed and analyzed for payment denials. The denial data for those medications will be pulled 30 days pre- and post-assessment. The assessment will evaluate medication, diagnosis, third party payer, type of insurance, amount billed, payment amount received, payment denial reason, prior authorization completion, date ordered, date medication administered, and clinic where the medication was administered for each claim denied. The information will be used to identify the exact reason for denials and patterns of denials. Assessment of denial data will be used to develop a standard process to verify benefits and increase reimbursement among UUHC outpatient clinics. The post-assessment analysis is expected to have a decrease rate of denials after implementation of that process.

ACPE #:0126-9999-13-063-L01-P
Learning Objectives:
Explain the importance of verifying reimbursement for medications administered or infused in the clinic setting.
INTRODUCTION: This study evaluates a pharmacist-managed anticoagulation program and its impact on co-morbidities in a tribal population. While institution-based, pharmacist-managed outpatient anticoagulation programs are well-established, minimal research supports success for programs based outside institutions. Additionally, there is negligible data for the success of pharmacist-managed diabetes programs in tribal populations. Our primary aim compares the percentage of therapeutic-range international normalized ratio (INR), blood pressure (BP), and hemoglobin A1C (A1C) measures pre- and post- program initiation. Our secondary aims are to: 1) evaluate the safety and adequacy of pharmacist-management of supra-therapeutic INRs and associated symptoms; 2) explore factors related to maintaining therapeutic INR and co-morbidity measures; and 3) explore program satisfaction.

METHODS: This study is Institutional Review Board approved. Inclusion criteria include tribal members > 18 who are currently receiving anticoagulation therapy, while those unable to give informed consent are excluded. Specific outcome measures are: percentage of therapeutic-range INR, BP, and A1C values; contributing factors for stability of these measures; adherence; and patient and provider program satisfaction. Data collection will occur through abstraction from the patients’ medical records. Upon consent, an initial chart review will be conducted for each participant. This retrospective review dates to initiation of warfarin therapy, or September 2008, whichever is earlier. This will be followed by a prospective series of quarterly chart reviews. Further, this study evaluates patient and primary care provider (PCP) satisfaction with the pharmacist-managed anticoagulation clinic. Participating patients and PCPs will be asked to complete satisfaction surveys, rating each of five factors using a 10-point scale. The factors surveyed relate to overall service, level of knowledge, ability to manage anticoagulation therapy, ability to communicate, and use of a teamwork approach. These surveys will be repeated on a quarterly basis through the end of the study period.

RESULTS AND CONCLUSIONS: Results and conclusions will be presented after data collection and analysis.

ACPE #:0126-9999-13-064-L01-P
Learning Objectives:
List the primary aims that were measured as a result of the pharmacist-managed anticoagulation clinic.
Describe the impact of a pharmacist-managed anticoagulation program implemented in a tribal health clinic.
56 - DEVELOPMENT AND IMPLEMENTATION OF AN EMERGENCY DEPARTMENT PHARMACIST SERVICE IN A RURAL BASED MEDICAL CENTER

B4. General Clinical Practice

Presented by:

Ryan Burt, PharmD
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Presenting on Tuesday, May 14 at 11:30 AM in Royal II

Introduction: The American Society of Health System Pharmacists and the Institute of Medicine agree that pharmacy involvement in a hospital emergency department (ED) is needed. By their very nature, EDs, are typically high risk areas because of high patient volume, incomplete medical histories, frequent interruptions, use of high risk medications, an unstructured medication use system, frequent verbal orders, and a lack of prospective pharmacist review. It has been estimated that 5 percent of patients visiting an ED experience a potential adverse drug event. St. Luke’s Magic Valley Regional Medical Center (SLMVRMC) is a 186 bed medical center that serves roughly 180,000 people in rural south central Idaho. SLMVRMC operates a 25 bed 24 hour ED. There have been 37,860 patients triaged through this ED in the last 12 months. Current pharmacist involvement is limited to telephone consultations and occasional participation in ED codes. The purpose of this project is to justify and develop an ED pharmacist position at SLMVRMC.

Methodology: This project is a quality improvement plan and is thus exempt from review by the Institutional Review Board. A pre and post implementation survey will be distributed to the ED staff to assess the perceived value of a pharmacist service in the ED as well as opportunities for future expansion of services. Current PGY1 residents at SLMVRMC will staff in the ED for 10 consecutive weeks and track all interventions made and codes attended. A cost/benefit analysis will be prepared and presented to the hospital administration and interested departments in an attempt to justify making this new service permanent.

Results: Will be presented.

ACPE #:0126-9999-13-065-L01-P

Learning Objectives:

- List the many risk factors related to patient safety present in the emergency department.
- Identify the areas that pharmacists can impact services in the emergency department.


57 - SUSCEPTIBILITIES OF EXTENDED SPECTRUM BETA-LACTAMASE (ESBL) PRODUCING E. COLI TO IMIPENEM VERSUS ERTAPENEM IN A FOUR-HOSPITAL SYSTEM

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Infections caused by extended spectrum beta-lactamase (ESBL) producing Enterobacteriaceae have steadily increased over the past two decades and are now commonplace in hospitals across the United States. These infections are associated with increased duration of hospital stay, increased cost, and higher mortality than infections caused by non-ESBL producing organisms. The antibiotics of choice for ESBL-producing Escherichia coli are carbapenems such as imipenem, meropenem, doripenem, and ertapenem. At Scripps Health, sensitivities of ESBL-producing Enterobacteriaceae are automatically tested against imipenem, as it resides on our panel. To obtain sensitivities to ertapenem, a separate Epsilometer test (Etest) must be ordered for each patient. This is time consuming, costly, and prolongs patient’s exposure to the more broad-spectrum carbapenems such as imipenem.

This retrospective and concurrent study will evaluate the correlation between the susceptibilities of ESBL-producing Escherichia coli to imipenem versus ertapenem. Two hundred non-duplicate isolates of ESBL producing Escherichia coli will be tested against both imipenem and ertapenem, using the Epsilometer test (Etest) method. Our aim is to determine if imipenem sensitivities serve as an appropriate surrogate marker for ertapenem. This will allow clinicians in the Scripps system to use ertapenem as definitive therapy for infections caused by ESBL-producing Escherichia coli in order to conserve imipenem for Pseudomonas aeruginosa and other multiresistant infections. Further, we aim to compare the susceptibilities between ESBL-producing Escherichia coli isolates from hospitals in the Scripps Health System to Vibra Hospital of San Diego, a nearby long-term acute care hospital (LTAC). Results and conclusions from this study will be presented at the Western States Conference in San Diego, California in May 2013.

ACPE #:0126-9999-13-066-L01-P

Learning Objectives:
- Explain the importance of de-escalation as a strategy of Antimicrobial Stewardship.
- Describe the clinically important differences between group 1 and group 2 carbapenems.


58 - VANCOMYCIN LOADING DOSES IN PATIENTS WITH SEPSIS, SEVERE SEPSIS, AND SEPTIC SHOCK

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Introduction: Mortality from sepsis and septic shock ranges from 22% to 76% across different countries. Rapid administration of antimicrobials is essential to prevent mortality from severe sepsis and septic shock. Vancomycin is an antibiotic commonly used for empiric treatment of sepsis. Weight based loading doses have been found to obtain therapeutic blood levels more quickly than standardized dosing. This study aims to determine if loading doses improve patient outcomes. The primary objective of this study is to determine if the use of loading doses of vancomycin in patients with sepsis, severe sepsis, or septic shock improves in-hospital
We also aim to determine if loading doses of vancomycin result in decreased hospital costs, antibiotic costs, length of ICU stay, length of hospital stay, and number of days on mechanical ventilation.

Methodology: This retrospective chart review included ICU patients at Loma Linda University Medical Center diagnosed with sepsis, severe sepsis, and septic shock and treated with vancomycin. The study period was from January 2012 to February 2013. Inclusion criteria will be: patients greater than 18 years of age, an ICD-9 diagnosis of sepsis, severe sepsis, or septic shock, admittance to an ICU unit, and treated with vancomycin. Patients will be excluded if their treating provider deemed them not to be at risk for gram positive infection.

Results and Conclusions: Results and conclusions will be presented after study completion.

ACPE #:0126-9999-13-067-L01-P

Learning Objectives:
1. Describe how vancomycin loading doses may facilitate rapid achievement of therapeutic blood levels.
2. Determine if vancomycin loading doses affects clinical and economic outcomes in critically ill patients with sepsis, severe sepsis, and septic shock.


59 - DEVELOPING A PROCESS TO IMPROVE ADULT INFLUENZA VACCINATION RATES AND GUIDELINE IMPLEMENTATION IN A CLINIC SETTING

B1. Ambulatory Care

Presented by:

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Presenting on Tuesday, May 14 at 4:00 PM in Bay View

Introduction: Literature has shown that implementation of evidence-based guidelines is often delayed in clinical practice. The objective of this study is to identify adult influenza vaccination rates at ten community clinics in a university-based health system and assess if there is a deficiency in following vaccination recommendations. A detailed process to assist in improving influenza vaccination rates and timely implementation of vaccination recommendations will be developed. This process can then be adapted to other clinical practice guidelines. By shortening the time to implementation of guidelines, health care providers will have greater access to these guidelines, providing patients with better care and decreasing preventable morbidity.

Methods: The first phase of this descriptive study consists of identifying influenza vaccination rates for adults 18 years and older at community clinics during the 2011-2012 influenza season. Rates will be determined through vaccine documentation in the electronic medical record. A survey will be distributed to clinic primary care providers to assess their opinions regarding barriers to following clinical guidelines and methods to increase implementation of guidelines. In the second phase of this study, a process and flowchart of methods will be developed to improve time to implementation of guidelines based on the survey information and other literature. Influenza vaccination recommendations will serve as an example of how to improve guideline implementation at the clinics.
Results: During the 2011-2012 influenza season, 26% of 67,827 adults with an office visit had documentation of administration of an influenza vaccine. When providers were surveyed about barriers to guideline implementation, 62.5% of those who responded identified insufficient time to learn new guidelines and 75.0% stated lack of awareness that guidelines have been released as barriers. When asked which would be useful to more quickly implement clinical guidelines, 79.2% of responders selected education for providers of new guidelines and 54.2% chose involvement of other healthcare professionals, including pharmacists. Seventy-one percent of survey responders strongly agreed that well-developed guidelines would improve quality of care at their practice site.

Conclusion: Barriers to guideline implementation at the clinics include insufficient time and lack of awareness of new guidelines. Potential methods to decrease delay to implementation of guidelines include education techniques and reminders in the electronic medical record. These methods may be included in a protocol to improve guideline implementation and influenza vaccination rates at the community clinics.

ACPE #:0126-9999-13-068-L01-P
Learning Objectives:
- Describe primary care provider opinions regarding influenza vaccination recommendations at community clinics
- Describe barriers to clinical guideline implementation and potential methods to decrease implementation delay


60 - FACTOR PRODUCT REVIEW AND DISPENSING PROCESS STANDARDIZATION

B4. General Clinical Practice

Presented by:
Shannon Buxell, PharmD
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Presenting on Tuesday, May 14 at 2:00 PM in Royal II

Introduction:
Coagulation factor products are associated with a host of clinical and operational complexities ranging from appropriate dosing to inventory management challenges. Despite a significant amount of hemophilia and trauma patient admissions to Oregon Health & Science University (OHSU), pharmacists have expressed a low comfort level and dissatisfaction surrounding the dispensing process for these agents. Numerous complications exist in determining the appropriate dosing and specific factor agent to be used for a given indication. The optimal dosing regimen for many factor products has yet to be defined and is heavily practitioner-dependent. Pharmacists typically receive minimal training and education on factor products to guide in dosing decisions, which is further compounded by the addition of new products on the market. Many of these products are frequently used “off-label” for indications other than the Food and Drug Administration (FDA) approved indication. Therefore, opportunities were identified to standardize dispensing process and administration practices and provide pharmacist education on factor products.

Methodology:
A pre-intervention survey was conducted to assess the pharmacists’ baseline satisfaction regarding factor dispensing and level of comfort with factor orders. The survey was distributed to all OHSU inpatient
pharmacists. Responses were collected voluntarily and anonymously. The survey results supported the necessity for guideline development, formulary management, and improved education for coagulation factors to increase pharmacist satisfaction and optimize inventory and utilization management.

Medication use evaluations were conducted on inpatient utilization of prothrombin-complex concentrate (PCC), factor IX, and factor VIII products from 2011 and 2012. Records for outpatient and ambulatory administrations were excluded. The analyses included the indication for the medication, the dose, the ordering provider / service area, and type of product sent (i.e., intravenous bag, syringe, or unmixed vial).

The dispensing process and medication records were assessed in concert with the information obtained in the medication use evaluation. The pharmacy informatics team is assisting in build changes to Epic medication records.

Relevant literature was reviewed and analyzed to aid in the development of guidelines. The guidelines were vetted through the clinical pharmacists, Anticoagulation Pharmacy & Therapeutics Sub-Committee, and Pharmacy & Therapeutics Committee prior to implementation.

Education on guideline development, formulary changes, and dispensing changes will be provided to pharmacists.

Results are pending and will be assessed via a post-implementation satisfaction survey and medication use evaluation.

Results and Conclusion are pending.

ACPE #:0126-9999-13-069-L01-P

Learning Objectives:
Describe the appropriate utilization of prothrombin-complex concentrates, factor IX, and factor VIII.
Explain the purpose and potential benefit of guideline development and formulary management for coagulation factor products.


61 - IMPACT OF A RECAPTURE INTERVENTION TO INCREASE PHARMACY PRESCRIPTION VOLUME AT A MILITARY TREATMENT FACILITY PHARMACY

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Richard Caballero, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Sunset III

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Category: C1. Pharmacoeconomics, Admin or Financial Mgmt
IRB Status: Not Needed

IMPACT OF A RECAPTURE INTERVENTION TO INCREASE PHARMACY PRESCRIPTION VOLUME AT A MILITARY TREATMENT FACILITY PHARMACY

Purpose: With the rise in health care costs in the United States over the last two decades it is important for organizations to actively seek cost-saving strategies. In the United States military, prescription medications that
are filled at a Military Treatment Facility (MTF) cost less tax dollars than those filled in the retail setting. The objective of this study is to determine an effective recapture strategy and its impact on the MTF prescription volume.

Methods: Prescription volume data was pulled for the Travis Air Force Base Pharmacy (Travis AFB) catchment area from the Department of Defense Tricare Management agency Pharmacy Operations Center. It included all prescriptions filled at one of the 3 settings 1) MTF 2) through the mail-order, and 3) in local retail pharmacies, over a 3 year period from Oct 2009 through September 2012. Data collected included setting, provider, medication, and prescription volume per month. Phase 1 included identification of the most applicable and efficient intervention to bolster recapture. Options included educating MTF providers and/or civilian providers. Phase 2 included implementation of the identified intervention and its impact on prescription volume. Options included 1) individual contact 2) mailing formulary copies 3) sending pharmacy formulary flyer via facsimile 4) e-mailing formulary copies digitally 5) creating an online formulary link. Data will be reported in a descriptive manner when necessary, the t-test performed for all continuous data with the fisher’s exact test utilized for all categorical data.

Results: The average prescription volume for the Travis AFB catchment area was 98,219±3,969/month. This was distributed in the settings of MTF, mail-order and retail pharmacy as 49.2%, 8.3% and 42.5 % respectively. Only 0.9% of the prescriptions being filled in the retail setting were written by MTF providers making them a poor interventional target. When all variables were accounted for, a combination of selective formulary mailing and facsimile deemed the most effective to be tested in phase 2.

Conclusion: Targeting MTF providers is an inefficient strategy for MTF prescription recapture. The impact of the chosen recapture strategy will be determined from results of the phase 2 arm.

ACPE #:0126-9999-13-070-L03-P

Learning Objectives:
- Explain the difference in Pharmacy options for DoD beneficiaries.
- Identify the most efficient strategy to re-capture prescription volume at the MTF.


### 62 - PROTHROMBIN COMPLEX CONCENTRATES (PCC) INR DOSE RESPONSE ANALYSIS IN PATIENTS WITH ICH: THE PIDRA-ICH STUDY

B3. Critical Care

Presented by:

Christine Cadiz, PharmD
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Presenting on Tuesday, May 14 at 9:00 AM in Executive 715

Background: In the United States, warfarin is the most common oral anticoagulant used to prevent thromboembolic events. Although warfarin effects can be monitored by measuring international normalized ratio (INR), major bleeding complications can still occur. Intracerebral hemorrhage (ICH) in patients taking warfarin is associated with high mortality rates. Vitamin K and fresh frozen plasma (FFP) are considered standard treatments for reversing INR, but have many limitations that may hinder emergent INR reversal. Prothrombin complex concentrates (PCC), composed of vitamin K dependent clotting factors II, VII, IX, and X, are widely used off-label to reverse international normalized ratio (INR) in patients on warfarin therapy. However,
limited studies have demonstrated the efficacy of INR reversal in patients with ICH and the optimal dose of PCC is not well characterized.

Objective: The primary objective of this study is to analyze the INR dose-response of the three-factor PCC, Bebulin VH, for patients with ICH treated at University of California San Francisco Medical Center, a tertiary care facility.

Methods: This is a single-center retrospective review of consecutive patients receiving PCC at UCSF Medical Center between January 2007 and August 2011. The study included patients greater than 18 years of age diagnosed with ICH or subdural hematoma, on warfarin, and had a baseline INR greater than or equal to 1.5. Patients were excluded if they had elevated INR due to liver disease, did not have a weight measurement, did not have pre- and post-PCC INR values, received recombinant factor VIIa, or received PCC for other indications such as GI bleed or pre-procedural INR reversal. Patients were stratified into subgroups according to PCC dose: low dose (<25 units/kg), intermediate dose (25-50 units/kg), and high dose (>50 units/kg). INR values were assessed prior to and after PCC administration.

Results: There were 73 patients on warfarin therapy with an ICH or subdural hematoma who received PCC for emergent INR reversal. The PCC doses ranged from 4 units/kg to 133 units/kg. Statistically significant reductions in INR were observed for all dose categories. For the low dose group (n=9), mean pre-PCC INR was 1.94, compared to post-PCC INR of 1.41 (mean difference 0.53 [95% CI 0.27-0.80], p=0.002). For the intermediate dose group (n=40), mean pre-PCC INR was 2.89 and post-PCC INR was 1.41 (mean difference 1.48 [95% CI 1.09-1.88], p<0.001). For the high dose group (n=24), mean pre-PCC INR was 3.1 and post-PCC INR was 1.38 (mean difference 1.73 [95% CI 0.88-2.58], p<0.001). There was no difference among post-PCC INR values across all groups.

Conclusion: Comparison of post-PCC INR values, as well as comparisons of mean INR change suggests that very high doses may not be necessary to reverse INR. However, other variables such as concomitant FFP or vitamin K administration need to be considered. Final results and conclusions will be presented after additional data are collected and further data analyses are performed.

ACPE #:0126-9999-13-071-L01-P

Learning Objectives:

Describe the current limitations of traditional INR reversal agents.
Describe the literature regarding the use of prothrombin complex concentrates to reverse INR in patients on warfarin and summarize the key findings of the PIDRA-ICH study.

In the United States, pneumonia is the leading cause of death related to infectious disease. Approximately 5.6 million adults are diagnosed annually with community-acquired pneumonia (CAP) and nearly 20% of these diagnoses require inpatient treatment. Although the mortality rate is less than 5% for outpatient CAP patients, the mortality rate rises to 12% for hospitalized patients on medical wards, and further increases to 40% in CAP patients in the intensive care unit.

Several studies have reported significantly decreased 30-day mortality and readmission rates with the implementation of evidence-based CAP protocols. Additionally, reports have shown that early administration of protocol-based empiric antibiotics in the emergency department have improved mortality and reduced the average length of stay.

Substantial variability with respect to antibiotic therapy selection in the treatment of CAP has been observed at UW Medicine-Valley Medical Center (UW-VMC). In an effort to reduce this variability and improve adherence to the Infectious Diseases Society of America/American Thoracic Society (IDSA/ATS) CAP guidelines at UW-VMC, a CAP protocol was developed for use in all adult patients with suspected diagnosis of pneumonia.

Objective:
The primary objective of this study is to examine prescriber adherence with the UW-VMC CAP protocol with regard to initial antibiotic selection. Secondary objectives include evaluation of length of stay and hospital readmission rates for CAP patients when patients were treated both on and off protocol.

Methods:
This evaluation is a retrospective review of all patients admitted to UW-VMC between 10/01/2011 and 9/30/2012 with a diagnosis of pneumonia who received initial antibiotic therapy utilizing the CAP treatment protocol order set. Patients were identified from a search of pharmacy database records. The data collected will evaluate the effectiveness of the empiric antimicrobial agents from the CAP protocol based on lab culture data, and risk stratification score. Additionally, the data will be used to evaluate the potential influence of the CAP protocol on duration of antibiotic therapy, length of hospital stay, re-admission rates for CAP as primary or secondary diagnosis within 30 days of discharge, and survival-rate at 30 days.

Results/Conclusion:
The results and conclusion of this study are currently pending. Findings from this study will help determine the effectiveness of the CAP protocol at UW-VMC.

ACPE #:0126-9999-13-072-L01-P
Learning Objectives:
- Discuss the importance of appropriate antibiotic selection as related to risk factor stratification in patients with pneumonia.
- Describe the impact of a CAP protocol on initial antibiotic selection, duration of antibiotic therapy, length of hospital stay, and 30-day readmission and survival rates in patients hospitalized with CAP.


64 - EVALUATION OF APPROPRIATENESS OF USE OF VANCOMYCIN AND MEROPENEM AT AN ACADEMIC MEDICAL CENTER
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Introduction: Inappropriate use of antibiotics can lead to selection of pathogenic organisms, and the emergence of resistance. Improper antibiotic usage has also been associated with the escalation of health care costs, and the increase of adverse drug events. Rates of inappropriate antimicrobial therapy have been estimated to be as high as 25-50%. The primary objectives of this study were to determine the presence and rate of inappropriate prescribing of vancomycin and meropenem. The study evaluated indication, dosing, and culture and sensitivity data to review the usage patterns of meropenem and vancomycin. The secondary objective of this study was to characterize the patients and indications in which the inappropriate prescribing occurred. Results from this study will be used to aid in the creation of strategies to improve the usage of these two antibiotics. Some of these strategies may include: formulary restriction and preauthorization, education, and optimization of antimicrobial order forms.

Methods: A retrospective observational study was performed in order to review the usage of meropenem and vancomycin from June 1st 2012 to June 30th 2012 at an academic medical center. Patients prescribed at least one dose of meropenem, vancomycin, or both antibiotics were included into the study, and their charts were reviewed. The study evaluated the antibiotics meropenem and vancomycin for appropriate use in 104 patients. Appropriate use was determined if empiric antibiotic therapy selection followed national guidelines and local resistance patterns. The dose of the antibiotics initially prescribed was also evaluated. Narrowing of antibiotic therapy was appraised based on available culture data.

Results and Conclusion: To be presented.

ACPE #:0126-9999-13-073-L01-P
Learning Objectives:
   - Describe the appropriate use of meropenem and vancomycin.
   - Describe the conditions in which inappropriate empiric antibiotic selection occurs.


65 - NEW FRONTIERS FOR PHARMACISTS IN FOSTER CARE

B6. Pediatric or Gender Specific Care

Presented by:

Sarah Carrillo, PharmD
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Presenting on Tuesday, May 14 at 8:00 AM in Sunset II

Children in foster care often face complications resulting from discontinuity in their lives. Alterations in living situations and caregivers can be frequent and abrupt, and while these children have higher rates of mental and behavioral health problems and trauma, the instability in their lives often impede their ability to obtain consistent and comprehensive healthcare. Disjointed and poorly maintained medical records exacerbate the risk of these children receiving inadequate or inappropriate care. In November 2011, the Center for Medicaid and CHIP Services sent a letter to state Medicaid directors citing a 16 state study, which revealed that foster children were prescribed psychotropic medications at a nine-fold higher rate compared to other children enrolled in Medicaid. This disturbing statistic prompted a push for the reformation of care coordination practices and led
the federal government to mandate that states develop an oversight process for psychotropic medication use in foster children. Pharmacists have long provided consultative medication review services in long-term care facilities and many other settings, and have been gaining a stronger foothold in facilitating transitions of care, even in community practice. As medication experts, pharmacists are uniquely positioned to screen for the appropriateness of therapeutic regimens, to monitor for side effects, and to educate patients and their caregivers regarding medications. As such, they have the potential to provide value for this population in a position of oversight, as well as in a more hands-on clinical role. Plans are currently in development to implement a psychotropic oversight process in California, but thus far, pharmacists have not been considered as prominent contributors to the care coordination and review processes. This study will help define roles for pharmacists in addressing the concerns over inappropriate and potentially excessive utilization of psychotropic medications in foster children. The proposal for these roles will be informed by several sources. Claims data will be analyzed to describe psychotropic utilization trends among California’s foster children, and current processes for care coordination among this population will be explored for optimization opportunities. State and local health departments will be surveyed by phone and email regarding positions and roles currently filled by pharmacists. A review will also be conducted regarding the policies and practices adopted by other states addressing the mandate. Finally, a selection of foster youth in central California between the ages of 15 and 18 will be given an online survey to gauge their preparedness for managing their own medications when they transition to independent living outside the foster care system. This will help determine the need for education on medications and on how to use pharmacy services. Results from these assessments will be used to propose viable and valuable roles for pharmacists in improving the healthcare and wellness of California’s foster children. The full report will be provided to relevant state agencies to inform the policies currently being developed to address the federal mandate for psychotropic oversight.

ACPE #:0126-9999-13-074-L01-P
Learning Objectives:
- Explain the need for improved care coordination for children in foster care.
- Describe the roles that pharmacists may play in improving medication use in foster children.


**66 - EVALUATING BISPHOSPHONATE INITIATION RATES POST FRAGILITY FRACTURE AND THE IMPACT ON VETERAN BONE HEALTH**

B5. Long-Term, Geriatric or Hospice Care

Presented by:

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Presenting on Tuesday, May 14 at 8:00 AM in Sunset IV

Background: Osteoporosis is an undertreated and under recognized health concern affecting an estimated 44 million people. One in four men and one in two women over the age of 50 will break a bone due to osteoporosis. The most frequently prescribed osteoporosis therapy is the initiation of a bisphosphonate, most commonly associated with post-menopausal osteoporosis treatment. Studies have shown the benefits of
bisphosphonate treatment, including improved survival in patients experiencing fragility fractures and a reduction in the rate of new clinical fractures. Although the benefits of bisphosphonate therapy have been evaluated, the majority of patients with osteoporotic fragility fractures have had low rates of bisphosphonate initiation. Veterans in the Community Living Center (CLC) who were admitted post fragility fracture will be evaluated for bisphosphonate initiation, continuation, and outcomes of secondary fracture up to 2 years post discharge. Findings from this study may help improve patient care and be used to develop future recommendations for Veterans at the PVAMC.

Objectives: The primary objective of this retrospective chart review is to determine the rate of bisphosphonate initiation in patients presenting with a fragility fracture to the Vancouver CLC and Comprehensive Rehabilitation Unit (CRU).

Secondary objectives include determining: (1) whether patients initiated on a bisphosphonate continued to receive their bisphosphonate therapy one year post discharge and (2) the incidence of secondary fractures two years post discharge from the CLC/CRU.

Methods: This retrospective study will be analyzing all Portland VA Medical Center (PVAMC) patients who presented to the CLC/CRU with a diagnosis of a fragility fracture in the study period from January 1, 2007 to December 31, 2010. Inclusion criteria will consist of Veterans admitted to the CLC/CRU with a fragility fracture who are greater than or equal to 50 years of age. Patients 50 years or less and those who have active bone diseases or cancer, decreased renal function of CrCl <30 mL/min, and corrected calcium <8 mg/dL will be excluded from this study. The primary endpoint includes the percentage of patients with a fragility fracture that were initiated on a bisphosphonate regimen during their stay at the CLC/CRU. Secondary endpoints include (1) the percentage of patients initiated on a bisphosphonate that continued to receive their prescribed bisphosphonate regimen one year post discharge from the CLC/CRU and (2) the percentage of patients experiencing a secondary fragility fracture two years post discharge.

ACPE #:0126-9999-13-075-L01-P

Learning Objectives:
- Describe the barriers associated with osteoporosis treatment initiation and continuation of therapy.
- Describe the pathophysiology of osteoporosis and the benefits of bisphosphonate therapy in the prevention of further bone destruction.


67 - PHARMACIST INTERVENTION IN POTENTIALLY INAPPROPRIATE DRUG-DISEASE INTERACTIONS IN VA LONG-TERM CARE RESIDENTS

B5. Long-Term, Geriatric or Hospice Care

Presented by:

Jennifer Chan, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Sunset IV

Introduction: The Community Living Center (CLC) at the San Francisco Veterans Affairs (SF VA) Medical Center is the organization’s 120-bed long-term care facility which provides veterans with various services, including long-stay continuing, rehabilitative, restorative, respite, and hospice care. Interdisciplinary team members provide these services to the CLC residents, who are primarily aged 65 years and older and have multiple chronic
conditions which are treated with various medications. The role of the clinical pharmacist in this setting includes performing routine drug regimen reviews and medication reconciliation to monitor appropriate medication use and enhance patient care outcomes. In this retrospective chart review, we aim to evaluate the presence of potentially inappropriate drug-disease interactions in SF VA CLC residents and to determine whether or not they were addressed in a drug regimen review (DRR) or medication reconciliation note by the pharmacist in the patient’s chart. The drug-disease interactions which were chosen for this study are those found to overlap between the 2012 Beers criteria and the Screening Tool of Older Person’s potentially inappropriate Prescriptions (STOPP) criteria, which are tools used to identify potentially inappropriate medications in older adults.

Methods: The study included SF VA CLC residents aged ≥65 years at time of drug initiation or admission to CLC with at least one drug-disease state combination of interest between 1/1/10 to 5/31/12. The drug-disease state combinations of interest included: digoxin > 125mcg/day with impaired renal function (eGFR< 50 ml/min), diltiazem or verapamil with heart failure, aspirin >325 mg/day with history of peptic ulcer disease (PUD) if not using concomitant gastroprotective agent, NSAIDs with history of PUD if not using concomitant gastroprotective agent, NSAIDs with any heart failure, NSAIDs with renal failure (eGFR<30 ml/min), and scheduled inhaled anticholinergic medications in veterans being treated with alpha blockers or hormonal agents for benign prostatic hyperplasia. Data collection included prevalence of the drug-disease interactions of interest and whether or not these interactions were addressed in a pharmacist note. Descriptive statistics were used to characterize SF VA CLC residents with drug-disease state combinations of interest. If the drug-disease interactions were addressed in DRRs or medication reconciliation notes, the type of recommendation made, such as whether to change the drug or dose, was also included in the data analysis.

Results and Conclusions: The results and conclusions from this study will be discussed.

ACPE #:0126-9999-13-076-L01-P

Learning Objectives:
- List examples of potentially inappropriate drug-disease interactions in older adults according to the 2012 Beers criteria and STOPP criteria.
- Describe the role of clinical pharmacists in the long-term care setting.


68 - ASSESSING THE EFFICACY OF IMPLEMENTING AN AUTOMATED KP MESSAGE SYSTEM IN THE TRANSITIONAL CARE PHARMACIST PROGRAM

B1. Ambulatory Care

Presented by:

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Presenting on Tuesday, May 14 at 4:30 PM in Bay View

Pharmacists have played an integral role in the hospital discharge process for several years. Studies demonstrate that follow-up phone calls after hospital discharge improve patient adherence to medication instructions, increase patient satisfaction, and reduce emergency department visits. Regular staffing of pharmacists to provide follow-up calls for all discharged hospital patients is often costly and may not be feasible due to limited resources. Implementing an automated telephone program could provide a means for reaching a larger patient population. The purpose of this project is to implement and assess the usefulness of an
automated telephone message system to help Transitional Care Pharmacists provide clinical interventions for patients with a risk for readmission. A four-question automated telephone survey was conducted prospectively between December 2012 to March 2013. Discharged hospital patients from Kaiser Permanente South San Francisco Hospital received an automated phone call within 48 hours if one of the following risk factors was present: diagnosis of congestive heart failure, diagnosis of diabetes, patients on anticoagulants, or patients previously readmitted within 30 days. Exclusion criteria included: patient age <18 years, enrollment in a special needs program, patients who do not have a Kaiser Permanente South San Francisco or Redwood City primary care physician, documented mental health and psychiatric problems, HIV patients, sexual trauma patients, and patients discharged to skilled nursing facilities or hospice. Using their telephone keypad, patients are instructed to respond “yes” or “no” to questions regarding side effects of their medications, understanding how and when to take their medications, and if all medications were obtained at discharge. Patients who report having concerns with any of the survey questions would receive a telephone call from the Transitional Care Pharmacist to clarify any medication-related issues. The results of the survey will be analyzed and compared between responders and non-responders using descriptive statistics. Characterization of demographics of patients between the two groups in the study will be presented. The effects of the pharmacist intervention and impact of implementing an automated telephone survey in expanding the transitional care pharmacist program will be discussed. Final results and conclusions will be presented.

ACPE #:0126-9999-13-078-L01-P

Learning Objectives:
- Describe the importance of having follow-up phone calls for discharged hospital patients.
- Explain how an automated phone survey can play an integral role in reaching, identifying, and resolving medication concerns for patients at risk for readmission.


69 - APPROPRIATENESS OF RENAL DOSING AFTER CPOE IMPLEMENTATION

B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 3:30 PM in Royal II

Background
In patients with renal insufficiency, dose adjustments of certain medications may be required to reduce the risk of toxicity while maintaining therapeutic efficacy. According to the 2004 Annals of Pharmacotherapy article by Long, the rate of noncompliance with established renal dosing guidelines in the inpatient setting has been estimated between 19 to 67 percent. A recent analysis of renal dosing rates at University of California, San Francisco (UCSF) Medical Center prior to Computerized Prescriber Order Entry (CPOE) implementation found that 28% of orders reviewed were dosed incorrectly. Of those, 68% were changed appropriately per the patient’s renal function; however, the time delay was approximately 19 hours to the correct dose. Since this analysis, UCSF has implemented CPOE and it is unclear whether this system will impact the rates of inappropriate renal dosing and time delay to the appropriate dose. The objectives of this study were to determine the rate of inappropriate prescribing for patients with renal insufficiency and the time delay to
appropriate drug dosing post CPOE implementation. This study also assessed whether CPOE affects the appropriateness of renal dose adjustments, studied bleeding outcomes associated with enoxaparin doses in renal insufficiency, and identified potential areas for improvement in accurate medication dosing in the setting of renal insufficiency.

Methods
This study was a retrospective review of medication profiles for adults with renal impairment admitted to the UCSF Medical Center. The patient populations investigated were adults receiving inpatient hemodialysis (HD), those on continuous veno-venous hemodialysis (CVVHD) and those with renal insufficiency not on dialysis during the first week of July, August, September, and October (7/1 – 7/7/2012, 8/1 – 8/7/2012, 9/1 – 9/7/2012, 10/1 – 10/7/2012). Inclusion criteria for patients on HD and CVVHD were all orders for antimicrobials found on the UCSF Medical Center Adult Antimicrobial Dosing Guideline. Inclusion criteria for patients with renal insufficiency were patients with a creatinine clearance less than 50 ml/min with inpatient orders for acyclovir (IV), cefepime, enoxaparin, famotidine, or trimethoprim-sulfamethoxazole (TMP-SMX). Exclusion criteria included age less than 18 years old, drug orders for one time administration, and antimicrobials used for prophylaxis purposes. Additional exclusion criteria for patients with renal insufficiency were no documented serum creatinine within 5 days of the order date, no documented weight within 1 month of the order date, and no documented height within 6 months of the order date. The primary outcome was rate of inappropriate renal dosing (i.e. not adjusted for renal impairment), and the secondary outcome was time delay to correct the inappropriate order. Other secondary outcomes included comparing renal dosing rates for pre-CPOE and post-CPOE data, determining the bleeding rates associated with enoxparin dosing in renal insufficiency, assessing the presence of a pharmacist intervention (iVENT) on renally adjusted medication orders, and assessing the presence of dialysis chart documentation at the time of order verification for the dialysis population.

Results and conclusion will be discussed.

ACPE #:0126-9999-13-79-L01-P

Learning Objectives:
- Explain the reason(s) why adjusting medications for renal function is important.
- Describe potential areas for improvement in accurate medication dosing in the setting of renal insufficiency in order to optimize patient safety and efficiency of care.


70 - INTRAVENOUS ESMOLOL IN PEDIATRICS: PHARMACODYNAMICS, ADVERSE EFFECTS, AND ADHERENCE TO AN INSTITUTIONAL PROTOCOL

B6. Pediatric or Gender Specific Care

Presented by:

Tihua Chao, PharmD
Rady Children’s Hospital San Diego
tnchao@rchsd.org

Presenting on Tuesday, May 14 at 9:30 AM in Sunset II

Background:
Esmolol is an intravenous beta-1 selective adrenergic receptor blocker used for the acute management of arrhythmias or hypertension in children. With a short half-life and rapid onset of action, esmolol is an ideal agent to titrate to desired effects. The purpose of this study was to examine the hemodynamic effects of
esmolol by investigating its actual use in intensive care practice, the hemodynamic and cardiovascular dose-response of the drug in pediatric patients, and adherence to an institutional esmolol protocol. We postulate that there are dose-limiting adverse effects such as bradycardia or hypotension that may limit the maximum dose of esmolol administered to infants and children. We aim to find the optimal incremental dose increase of esmolol to achieve the desired hemodynamic response and manage adverse effects.

Methods:
In this prospective study, patients receiving esmolol between November 2012 and February 2013 were identified using a medication utilization report in the electronic medical record. Data on patient vital signs, including mean arterial blood pressure, systolic blood pressure, diastolic blood pressure, and heart rate, were collected 15 minutes before, during, and 15 minutes after esmolol infusion from bedside telemetry monitors. Doses of esmolol and other concurrent cardiovascular medications were also recorded. Using existing titration and dosing guidelines developed by the pediatric electrophysiologist at Rady Children’s Hospital San Diego (RCHSD), we evaluated the efficacy and incremental dose-response of esmolol in the setting of supraventricular tachycardia (SVT) and/or hypertension.

RCHSD esmolol use guideline:
• Bolus esmolol IV: 50 mcg/kg, given over 5-10 minutes
• Infusion esmolol IV: 100 mcg/kg/min, increase by 50 mcg/kg/min every 15 minutes as needed for desired effect, max dose 300 mcg/kg/min
• Esmolol should be discontinued within 36 hours
• Heart rate and/or blood pressure goals to be determined by the physician

Data will be analyzed to describe the efficacy and dose response of esmolol on blood pressure and heart rate and determine the dose at which dose-limiting adverse effects occur.

Results:
This study evaluated the use of esmolol in 8 intensive care patients, ages ranging from 3 weeks of age to 25 years of age representing 10 different periods of esmolol use. Esmolol was used for blood pressure control in 6 instances and used for heart rate control in 4 instances for indications including post-surgery, post-cardiac arrest, and SVT. Final results to be presented. The incremental dose-response of esmolol and the esmolol dose at which adverse effects such as hypotension or bradycardia occur will be described. The efficacy of esmolol in reaching blood pressure and heart rate targets by observing the dose required to meet the cardiovascular goals, the time patients spent in the target range, the number of dose changes and time required to meet the goals, and the impact of patient age on esmolol response will be determined. Additionally, as a quality control measure, adherence and deviations from the recommended protocol at RCHSD will be noted, with a view toward protocol revision as needed and medical staff education.

Conclusions:
Results from the study will be presented.

ACPE #:0126-9999-13-80-L01-P
Learning Objectives:
Describe key findings regarding the hemodynamic/cardiovascular dose-response of esmolol and dose-limiting adverse effects in pediatric intensive care and neonatal intensive care patients.
Describe the efficacy of esmolol in the termination of arrhythmias and management of hypertension in pediatric patients.

Background: Currently, broad-spectrum antibiotics such as beta-lactams, are recommended for the empiric treatment of sepsis. In patients who are allergic to beta-lactam antibiotics (e.g., penicillin allergy), aztreonam is predominantly the medication of choice. However, in comparison with other broad spectrum beta-lactam, aztreonam lacks anaerobic and gram-positive coverage. There are currently no studies investigating the outcomes of penicillin-allergic patients with sepsis based on the empiric antibiotic regimens they received. Therefore, the purpose of this study is to investigate the outcomes of adult patients admitted to the emergency departments at UCSD Health System with suspected sepsis who received aztreonam versus patients given standard beta-lactam antibiotics. The data will be used to assess whether penicillin-allergic patients received proper antibiotic coverage with aztreonam-based regimens and if additional antibiotics should be added to this patient population. Providing adequate antibiotic coverage is critically important given the high risk of mortality associated with sepsis.

Objectives: The primary objective of this study is to investigate the effect of aztreonam use on in-hospital mortality in reported penicillin-allergic patients versus standard beta-lactams for the empiric treatment of sepsis. Secondary objectives include evaluating overall hospital length of stay (LOS), intensive care unit (ICU) length of stay, and duration of antibiotic therapy.

Methods: The project will be a retrospective chart review of code sepsis patients presenting to UCSD Health System Hillcrest or La Jolla emergency departments from April 1, 2012 to December 31, 2012. Patients greater than 18 years of age who meet sepsis criteria (defined as having indicators for an infectious source and evidence of hypoperfusion) and receive either beta-lactam or aztreonam for empiric antibiotic therapy will be evaluated. Patients are considered penicillin-allergic if the allergy is documented in the electronic medical record or reported by the patient. Patients younger than 18 years old, receiving antibiotics less than 24 hours, and who do not meet sepsis criteria will be excluded. The data from this study will be analyzed using appropriate descriptive statistics.

Results & Conclusions: Will be presented upon completion of data collection and analysis.

ACPE #:0126-9999-13-081-L01-P

Learning Objectives:
1. Describe the role of aztreonam in the empiric treatment of patients presenting with sepsis in the emergency department.
2. Explain the impact of aztreonam versus beta-lactam empiric antibiotic regimens on clinical outcomes in patients with sepsis.

72 - OPTIMIZING CONGESTIVE HEART FAILURE MANAGEMENT IN AN INPATIENT SETTING
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

**Tammie Chau, PharmD**
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Presenting on Tuesday, May 14 at 8:30 AM in Royal V

PURPOSE:
Heart failure affects 6 million adults in the United States and up to 20 percent of patients are readmitted within 30 days of hospitalization. The Centers of Medicare and Medicaid Services (CMS) recently implemented a reimbursement penalty for hospitals with high 30-day readmission rates. Some hospitals are proactively instituting programs to reduce the number of hospital readmissions. At Desert Regional Medical Center, a multidisciplinary team evaluates the care heart failure patients receive in the hospital and provide follow-up care to promote patient’s successful transition to home or to skilled nursing care. Pharmacists can play a pivotal role in reducing congestive heart failure readmissions by making appropriate clinical recommendations of dose initiation and dose optimization. A pilot program uses the clinical skills of pharmacists to perform medication reconciliation, drug regimen review, and patient education prior to discharge. The objectives of this study are to (1) determine the number of interventions a clinical pharmacist can make in optimizing the treatment for congestive heart failure patients and (2) reduce the number of 30 day readmission rates.

METHODS:
This study did not require submission to our Bioethics Committee or the Institutional Review Board for approval. All patients on the 30-day readmissions list with medical code diagnosis of congestive heart failure were reviewed between 09/2012 – 01/2013 for comparison of active medications from admission to inpatient setting. Medications, laboratory and diagnostic tests were retrieved from the Cerner Millennium Computer System. From 02/2013 to 04/2013, patients with a diagnosis of congestive heart failure were screened for pharmacy consult. The clinical pharmacists would review heart failure medications such as ACE-inhibitors/ARBs, beta blockers, and loop diuretics and make appropriate clinical recommendations to attending physician and/or cardiologist. The following data will be collected and analyzed: (1) medication reconciliation of guideline-recommended heart failure regimen (2) number of recommendations made and accepted by prescribers, and (3) readmission history.

RESULTS:
Preliminary results will be presented at the conference.

ACPE #:0126-9999-13-082-L01-P

Learning Objectives:
- Explain the current obstacles associated with heart failure readmission rates
- Describe the pharmacist’s role in optimizing the treatment for congestive heart failure patients

73 - EVALUATION OF INTERVENTIONS MADE BY PHARMACISTS UTILIZING AN ANTIBIOTIC STEWARDSHIP REPORT IN A CHILDREN'S HOSPITAL

B6. Pediatric or Gender Specific Care

Presented by:

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Presenting on Tuesday, May 14 at 10:30 AM in Sunset II

BACKGROUND: The rising challenge of antibiotic resistance has led to a surge of interest in antibiotic stewardship programs (ASPs). ASPs have created a new niche for healthcare providers, and pharmacists are taking on progressively more active roles in their development and implementation. While studies have shown the value of having pharmacists involved in ASPs in adult healthcare facilities, fewer studies have examined interventions made by pharmacists in a pediatric setting.

OBJECTIVES: To describe the types of interventions made by pharmacists utilizing an ongoing daily antibiotic stewardship report at a children’s hospital and to determine whether new protocols or pharmacy services may be developed to ensure continued hospital-wide antimicrobial stewardship.

METHODS: This is a retrospective, descriptive review of interventions made by pharmacists utilizing a daily antibiotic stewardship report generated from the hospital’s electronic medical record from July 2012 through March 2013. Patients include general pediatrics patients, neonatal intensive care patients, and pediatric intensive care patients at Miller Children’s Hospital. Descriptive statistics will be used to describe categories of pharmacist interventions, including change in the type, dose, frequency, duration, or formulation of an antibiotic. Descriptive statistics will also be used to characterize the rationale for each intervention made, including indication or diagnosis, microbiology culture results, drug interactions, renal dysfunction, hepatic dysfunction, weight-based dose adjustments, and adjustments for age and maturation.

RESULTS and CONCLUSION: To be presented.

ACPE #:0126-9999-13-083-L01-P
Learning Objectives:
- Describe the role of pharmacists in ensuring antibiotic stewardship at a pediatric acute care hospital.
- Explain how an ongoing antibiotic stewardship report may be used to aid pharmacists in monitoring antibiotic medication therapy on a daily basis.


74 - INFLUENCE OF PAIN MANAGEMENT OPIOID MEDICATION AGREEMENTS ON PATIENT COMPLIANCE

A5. Neuro-Psych or Pain Management Agents

Presented by:

Grace Chen, PharmD
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Introduction:
Opioids are widely utilized for a myriad of pain conditions, but their use in chronic pain is complicated by their potential for abuse, physical or physiological dependence, side effects, unintentional overdoses, and legal prosecution. According to the Centers for Disease Control and Prevention, 73.8% of the prescription drug overdose deaths were attributed to opioids in 2008. One way to mitigate provider apprehension about prescribing opioids is to implement pain management opioid medication agreements. These agreements specify expectations prior to initiating or continuing therapy, with provisions that can include limitation of opioid quantities, restriction to one pharmacy and one prescriber, specified office visits, mandatory urine drug screening, and description of behaviors that will lead to discontinuation of opioid therapy. Despite the popularity of these patient-provider medication agreements, there is a paucity of studies demonstrating their effect on clinical outcomes (pain relief or physical function), treatment plan adherence, or patient satisfaction.

Objectives:
This project will determine whether a correlation exists between implementation of opioid medication agreements and patient compliance to the terms of the agreements. The primary objective is to evaluate the impact of opioid medication agreements by determining their influence on patient compliance using early refill history, ED utilization, and number of providers issuing opioid prescriptions per patient. The secondary objective is to explore prescriber opinion on the utility of the medication agreement.

Methodology:
Study population will be identified from the regional Kaiser Permanente quarterly CII Report for Modesto and Manteca Medical Centers (Central Valley Area). This report contains a list of patients on CII opioid therapy with an average daily dose equal to or greater than 100 mg morphine equivalents. The 2012 first and second quarter reports will be reviewed and patients without an opioid treatment agreement documented in Kaiser Permanente electronic medical records will be excluded. For the remaining patients, a retrospective chart review of medical records, pharmacy prescription records, and the California Prescription Drug Monitoring Program (CURES) databases will be conducted to document history of early refills, ED utilization, and the number of prescribing providers. Data 6 months pre- and post- medication agreements will be reviewed. For the provider perspective survey, an online survey tool will be utilized to deliver the survey to all adult primary care providers within Kaiser Permanente’s Central Valley Area. Providers will be surveyed on potential barriers to implementation of medication agreements and perceived impact of the agreement on medication compliance and their prescribing practices. Patient compliance pre- and post-medication agreement will be compared using chi-square test. Descriptive statistics will be used to evaluate provider opinion on medication agreements.

Results and Conclusion:
To be presented.

ACPE #:0126-9999-13-084-L01-P
Learning Objectives:
- Explain impact of opioid medication agreements on patient compliance
- List physician barriers to implementing medication agreements


75 - CORRELATION BETWEEN UNIFIED PARKINSON’S DISEASE RATING SCALE AND GLOBAL IMPRESSION OF CHANGE SCALES
A5. Neuro-Psych or Pain Management Agents
Presented by:

**Gloria Cheng, PharmD**  
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**Presenting on Tuesday, May 14 at 10:30 AM in Palm III**

The Unified Parkinson’s Disease Rating Scale (UPDRS) is a standardized, clinician rating scale to assess signs and symptoms of Parkinson’s disease. It is also the gold standard for assessing clinical efficacy in drug therapy studies. The Movement Disorder Society Task Force on Rating Scales for Parkinson’s disease has reinforced the idea and need to identify thresholds on the UPDRS that represent clinically important and relevant differences. Determining a UPDRS change that makes a clinically important difference is relevant because assessments done by clinicians may not always match with a patient’s own impression of their disease and experience.

The purpose of this prospective, single-center, investigator-initiated study is to determine the correlation of changes in the clinician-rated UPDRS with impressions of change as determined by a patient global impression of change scale (PGIC). A secondary objective is to correlate changes in UPDRS with impression of change as determined by the clinician-rated Clinical Global Improvement (CGI-I) scale.

Procedures include the subject completing a PGIC assessment form, and the study doctor performing a CGI-I assessment. Other assessments (e.g., UPDRS) and all therapeutic interventions will be as per standard of care. For each subject, data will be collected prospectively at baseline and subsequently for each clinic visit over 12 weeks. Subjects between the ages of 18 to 89 years will be eligible for this study if they have a diagnosis of Parkinson’s disease, are English-speaking, and are alert and oriented to time, place and person. Subjects with known cognitive impairment and with atypical parkinsonism will be excluded. Each subject’s participation will last 3 months. Study subjects will be recruited and screened at the Loma Linda University Neurology Clinic by the study doctors for eligibility. Study doctors will obtain informed consent at time of patient visit. An estimated 500 subjects will participate in the study.

Results and conclusions will be presented at Western States Conference.

ACPE #:0126-9999-13-085-L01-P

**Learning Objectives:**

- Explain what the UPDRS scale is and its utility as an assessment tool for Parkinson’s disease
- Describe the correlation between the clinician’s impression of change, patient’s impression of change, and UPDRS


76 - EVALUATION OF THE COST-EFFECTIVE ROLE FOR PHARMACISTS IN MEDICATION RECONCILIATION

D1. Medication Safety

Presented by:

**Kimberly Cheng, PharmD**  
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**Presenting on Tuesday, May 14 at 8:30 AM in Palm I**
Introduction: In recent years, studies have determined that adverse effects in hospitalized or recently discharged patients may be related to medication discrepancies. In 2005, the Joint Commission adopted and began enforcing a new National Patient Safety Goal (NPSG 03.06.01) that requires hospitals to reconcile medications across the continuum of care. While medication reconciliation is commonly done by nursing staff, studies show that pharmacists can conduct more thorough and accurate reconciliations, preventing potentially harmful discrepancies. The purpose of this study is to evaluate this hospital’s current medication reconciliation process and determine the time spent by a pharmacist gathering medication data. In addition, the study hopes to identify any needed changes to the current workflow to improve patient care and to meet the Joint Commission National Safety Goal.

Methods: A list of patients admitted in the previous day is printed out every morning on study days. Patients are randomly selected to participate in the study and interviews are conducted within 24 to 48 hours of admission. The pharmacist interviews the patient and parent using a standardized form to collect information about home medications. When the interview is complete, the pharmacist will compare data from the interview with the home medication list and inpatient medication list from the MediTech system. If discrepancies are identified, the pharmacist will contact the attending physician for clarification. Data collected will include the start and stop times for the patient interview, reconciliation of interview information with admission orders, and review of discrepancies with the attending physician.

Results and conclusion will be presented.

ACPE #:0126-9999-13-086-L04-P
Learning Objectives:
   Describe the medication reconciliation process in a pediatric hospital setting.
   List the average times required for a thorough medication reconciliation (interview, reconciliation, and clarification with physicians).


77 - THE IMPACT OF PHARMACIST-DRIVEN INTERVENTIONS ON REDUCING INAPPROPRIATELY ORDERED AND DRAWN VORICONAZOLE TROUGHS
B6. Pediatric or Gender Specific Care

Presented by:
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Presenting on Tuesday, May 14 at 10:00 AM in Sunset II

Introduction:
Voriconazole is used at Children’s Hospital Los Angeles (CHLA) for prophylaxis and primary treatment of fungal infections. Voriconazole trough levels provide information on what clinicians may expect in terms of efficacy and toxicity. Trough concentrations ≥1mcg/mL have been associated with clinical success, while levels > 6mcg/mL are associated with significant ocular and hepatotoxicity. Unfortunately, due to complicated age-specific dosing, hepatic metabolism and drug interactions, levels cannot be predicted based solely on weight-normalized dosing strategies. Therefore, trough levels need to be drawn to optimize voriconazole safety and efficacy. Levels should be drawn within the hour prior to the next administration after 7 days of consistent administration to capture
steady state trough levels. Incorrectly drawn voriconazole levels can lead to inappropriate dose adjustments, medication errors, and an increase in unnecessary costs.

Objectives:
1) Determine the extent to which voriconazole levels are incorrectly drawn at CHLA.
2) Reduce the number of incorrectly drawn voriconazole levels through a pharmacist-driven education program and clarification of laboratory order nomenclature.
3) Estimate cost savings associated with the reduction in the number of inappropriately drawn voriconazole levels.

Methods:
This study was conducted in two phases, a retrospective observational study to determine the extent to which voriconazole levels are incorrectly drawn and a prospective study to evaluate a pharmacy-driven intervention’s effectiveness at reducing inappropriately drawn levels. In the retrospective observational study, all patients who received voriconazole between 9/1/12 – 12/18/12 were identified using the pharmacy database. Levels were included in the study if they met the following criteria: 1) level correlated with an inpatient medical stay, 2) voriconazole administrations were recorded, and 3) voriconazole levels were drawn during periods of consistent administration. Levels were excluded if they were drawn during an outpatient clinic visit. Voriconazole levels were then evaluated to determine if they were drawn as troughs, as defined above. The results were reported using descriptive statistics. Results were presented to the Antimicrobial Subcommittee and education was provided to medical, nursing, and pharmacy staff. Along with education, an information service request was made by the pharmacist to change laboratory orders so that “Voriconazole Trough Level” is specified, instead of “Voriconazole Level” when levels are ordered. For the prospective study, voriconazole levels will be evaluated to determine the impact of pharmacist-driven interventions to provide cost savings by reducing the number of inappropriately drawn levels.

Results/Conclusions:
The retrospective chart review of inpatients on voriconazole at CHLA revealed 46% (120 of 260) of evaluable levels were drawn at the wrong time. The results of the prospective study will also be presented.

ACPE #:0126-9999-13-087-L01-P
Learning Objectives:
- Describe the core areas of a plan to alleviate barriers within the patient care continuum.
- List criteria for appropriate voriconazole level evaluation.


### 78 - IMPLEMENTATION OF A PHARMACY DRIVEN STEWARDSHIP TO REDUCE INAPPROPRIATE ANTIBIOTIC USE IN ASYMPTOMATIC BACTERIURIA

A1. Infectious Disease - Anti-infective Agents

Presented by:

**Stephen Cheung, PharmD**  
Memorial Hospital - University of Colorado Health  
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*Presenting on Tuesday, May 14 at 4:00 PM in Dockside*

Purpose
The benefits of Antimicrobial Stewardship Programs (ASP) in hospital-based care have extensively been studied and defined. The Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America have published guidelines on the development of ASPs within healthcare institutions. Asymptomatic bacteriuria is not only commonly and frequently misdiagnosed, but treated inappropriately as a urinary tract infection (UTI). Appropriate diagnosis and treatment of a UTI are important aspects of any antimicrobial stewardship program. The goal of this project is to minimize the use of inappropriate antibiotics and to target therapy with appropriate dosing and duration with the ultimate goal of minimizing antibiotic selective pressures, toxicities, adverse effects and cost.

Methods
The hypothesis of this study is that the implementation of a pharmacy driven ASP will improve rates of optimal antimicrobial therapy, decrease days of treatment and decrease cost. All adult medical and emergency department patients with an appropriately collected urine specimen and positive urine culture, defined by a quantitative count $\geq 10^5$ CFU/mL, were reviewed for documentation of symptoms of fever, urgency, frequency, dysuria, suprapubic tenderness and change to mental status. Asymptomatic bacteriuria was defined as a patient with a positive urine culture and no signs or symptoms of a UTI, and no other sources of infection as indicated by fever, leukocytosis or physician documentation. The first phase of the study was a retrospective analysis of bacteriuria to determine if treatment was appropriate. The second phase was a prospective interventional study using a pharmacy driven protocol with educational interventions to determine if misuse of antimicrobials could be reduced. Educational materials were distributed to medical and emergency staff through direct education as well as the hospital’s Pharmacy and Therapeutics newsletter. Data collected from the retrospective and prospective audit were used as comparators to determine the program’s effectiveness. Data collection included patient age, sex, urine analysis, urine culture results, patient’s temperature, white blood cell count, signs or symptoms of a UTI, antibiotic prescribed, doses and route of antibiotics, and the location and department during treatment. Electronic medical records along with a data mining tool were used to screen cultures, review antimicrobial use and identify patients where an intervention was appropriate. Antibiotic usage and costs were determined by measuring the defined daily dose per 1,000 patient days and days of therapy. Provider acceptance, antimicrobial selection and length of treatment were documented to assess the impact of the APS. Statistical analysis was done using the Student’s t-test with a two-tailed level of significance (P$\leq$0.05). Seventy-five patients in both arms of the study were necessary for adequate power (80%). This project was approved by the institution’s Investigational Review Board.

Results and Conclusion
Data is currently being collected. Results and conclusion will be presented during the conference.

ACPE #:0126-9999-13-088-L01-P
Learning Objectives:
- Describe the diagnosis of asymptomatic bacteriuria vs. a urinary tract infection.
- Explain the recommendations from evidence-based guidelines for the screening and treatment of asymptomatic bacteriuria.

Chrislynn Chew, PharmD  
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Chrislynn.E.Chew@kp.org

Presenting on Tuesday, May 14 at 5:00 PM in Bay View

Introduction: There are several ongoing Hepatitis C clinical trials at Southern California Kaiser Permanente San Diego. Currently, the hepatology department is operating at its maximum capacity, and there are many patients wishing to enroll in hepatology research studies during a short window of time. Because of the complex nature of these medication regimens, addition of a clinical pharmacist to the Hepatology Research Team is considered optimal to improve workflow efficiency and increase study enrollment.

Methodology: Recently, Southern California Kaiser Permanente San Diego implemented a pharmacist role as a standard of care in the hepatology research department. The goal of this project is to evaluate the impact of this clinical pharmacist on workflow efficiency/productivity and patient study enrollment rates. Workflow efficiency/productivity and study enrollment rates will be measured by the number of patients enrolled per case manager per six-month period. Workflow efficiency and productivity will focus on pre-enrollment and screening times for drug-drug interactions and review of medications for contraindications by a research nurse compared to a pharmacist. Enrollment rates will then be associated and determined by the number of additional patients enrolled due to a pharmacist’s increased productivity and decreased processing times. These will be measured prior to and after the implementation of a pharmacist.

Results: Study is still ongoing
Conclusion: Study is still ongoing

ACPE #:0126-9999-13-089-L01-P
Learning Objectives:
- Explain how to integrate a clinical pharmacist in hepatology research.
- Describe the role of a clinical hepatology research pharmacist.


80 - PHARMACIST MANAGEMENT OF HYPERTENSION, HYPERLIPIDEMIA, AND DIABETES MELLITUS IN THE NATIVE AMERICAN POPULATION

B1. Ambulatory Care

Presented by:

Lindsey Childress, PharmD
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Presenting on Tuesday, May 14 at 2:00 PM in Executive 715

Heart disease is the leading cause of death in the Native American (NA) population. At Warm Springs Health and Wellness Center (WSHWC), a Collaborative Practice Agreement (CPA) for the pharmacy-run hypertension clinic has been in place since March 2005 and as of 2011, 35 patients were enrolled in the clinic. Of these patients, 84.2% met the blood pressure goal of <140/90mmHg and 66.7% of diabetic patients met the goal of <130/80mmHg. This exceeds the overall control of patients with a diagnosis of hypertension at WSHWC in which
79.2% met the blood pressure goal of <140/90 mmHg and 50.1% of diabetic patients met their goal of <130/80 mmHg. At WSHWC currently, there are 595 active diabetic patients. The Government Performance and Results Act (GPRA) measures are used to evaluate clinical endpoints and parameters in order to validate use of federal funding, including funding related to the operation of the Indian Health Service. WSHWC consistently demonstrates compliance at meeting various GPRA measures, however over the past two years, the GPRA measure for patients with poor glycemic control (hemoglobin A1C >9.5%) has not been met. To meet the target, only 18.6% or less of diabetic patients should have an A1C >9.5%. As of June 30, 2012, 24.7% of patients had poor control. The implementation of the Happy Heart Clinic (HHC) at WSHWC expands upon the existing hypertension clinic by including diabetes and hyperlipidemia management and allows for a more comprehensive approach to cardiovascular care.

The aim of this research is to evaluate the impact of disease state management in the NA population following the implementation of the pharmacy-run HHC. Disease states included in this research are hypertension, hyperlipidemia, and diabetes mellitus.

The HHC began accepting patient referrals October 1, 2012 and seeks to manage the included disease states based on current clinical practice guidelines and standards of care. Medications and doses included in the clinic protocol are on the clinic formulary and are FDA-approved for the treatment of these disease states. Inclusion criteria includes age 18 years or older, a documented diagnosis of one or more of the included disease states (hypertension, hyperlipidemia, and/or diabetes) for at least one year prior to provider referral, and a minimum of two laboratory and/or vital sign data points will be required for evaluation (at baseline and at least one monitoring point at a follow-up visit). Patients will be excluded from enrollment if unwilling to attend scheduled appointments and will be discharged from the clinic if three consecutive appointments are missed or if they fail to see their designated provider at least once yearly.

To assess the clinical impact, blood pressure, hemoglobin A1C, and lipid panel (total cholesterol, low-density lipoprotein, high-density lipoprotein, triglycerides) values will be measured as primary outcomes and patient satisfaction evaluated as a secondary outcome measure. Each patient will act as their own control and baseline data will be used as the comparator of pre-pharmacist intervention. Data will be collected retrospectively through review of standardized electronic chart notes.

ACPE #:0126-9999-13-090-L01-P

Learning Objectives:

- Describe the effect of the pharmacy intervention on hypertension, hyperlipidemia, and diabetes in a pharmacist-managed clinic.
- List both the benefits and barriers that arose throughout the implementation of the Happy Heart Clinic.


81 - EVALUATING A PROACTIVE PANEL SUPPORT (PROPS) PHARMACY PROGRAM IN AN INTEGRATED HEALTH CARE SYSTEM

B1. Ambulatory Care

Presented by:

Megan Ching, PharmD
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Presenting on Tuesday, May 14 at 2:30 PM in Executive 715
INTRODUCTION: The Kaiser Permanente Northwest (KPNW) Region launched a new population-based care program staffed by pharmacists and support personnel. The ProPS (Proactive Panel Support) program provides high quality care and service to high risk cardiovascular disease patients. The goal of ProPS is to provide proactive, pharmacy services support to Primary Care Providers (PCPs) and Medical Assistant (MA) dyad teams. The focus is on patient engagement, initiation of cardiovascular risk reduction preventative measures, and treating to target for improved hypertension, dyslipidemia, and diabetes control. The objective of this project is to assess the potential impact of the KPNW ProPS program on short term quality measures related to cardiovascular risk reduction.

METHODOLOGY: The KPNW ProPS program will be implemented in two, selected KPNW medical offices over a period of 6 months. The initial target patient population will include diabetes and/or cardiovascular disease patients (ages 18-75) with uncontrolled hypertension. Patients with complex care (i.e. pregnancy, dialysis, transplant patients, chemotherapy) or barriers to care (i.e. receiving outside care or hospice) will be excluded from this study. Data collection will compare quality outcomes of pre- and post- ProPS metrics over the 6 month implementation period. The primary outcome is the percentage change of all medical office patients at blood pressure goal. Secondary outcomes will include quality and service measures such as diabetes control, initiation of cardiovascular risk reduction medications, and satisfaction surveys results. A secondary analysis will also be performed for the ProPS patient population. Data collection from the ProPS patient population will quantify and categorize ProPS pharmacist interventions, as well as measure the percentage change of ProPS patients at blood pressure goal. Outcomes will be assessed using an intention-to-treat analysis. The results and conclusion will be presented.

ACPE #:0126-9999-13-091-L04-P
Learning Objectives:
1. Describe the ambulatory clinical pharmacist role in an integrated, population-based health care program.
2. Assess the potential impact of a proactive panel support pharmacy program in an integrated healthcare system on short term quality measures related to cardiovascular risk reduction.


82 - EVALUATION OF A WEIGHT-BASED ANTIMICROBIAL DOSING PILOT PROTOCOL: FOCUS ON PENICILLIN AND CEPHALOSPORIN ANTIBIOTICS
A1. Infectious Disease - Anti-infective Agents

Presented by:
Breanne Chipman, PharmD
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Presenting on Tuesday, May 14 at 4:30 PM in Dockside

Background:
Dose optimization is a key component of antimicrobial stewardship. Many clinical factors and patient characteristics need to be taken into account in the appropriate dosing of antimicrobials, and weight is an important patient factor. In 2010, a resident project established a pharmacist-initiated weight adjusted antimicrobial dosing protocol at a single hospital within the health system to address the growing need for more appropriate dosing in the obese patient population. The protocol is based on available evidence,
pharmacokinetic changes in obesity, and the pharmacodynamics of antimicrobial agents. The protocol remains in the pilot stage, but system-wide implementation is desired for dosing guidance and optimization in the obese patient population. A review of the pilot protocol including efficacy and safety data needs to be undertaken to provide further evidence and support for the dosing regimens recommended.

Objective:
The aim of this project is to assess clinical effectiveness and safety outcomes in adult patients receiving weight adjusted intravenous penicillin and cephalosporin antibiotics compared to patients of a similar weight receiving standard doses. Evaluation of this data will be used to develop and support a system-wide weight adjusted dosing protocol proposal for penicillin and cephalosporin antibiotics, which will serve as a starting point for a comprehensive system-wide weight adjusted antimicrobial protocol.

Methods:
This retrospective study will utilize data from the electronic health record of the health system. The study population includes patients at least 18 years of age, weighing more than 100 kg receiving an intravenous penicillin or cephalosporin antibiotic from June-December 2011 at Legacy Good Samaritan Medical Center. Study and control groups will consist of a random selection of 100 patients in each group: patients receiving weight adjusted antibiotic dosing and patients receiving standard antibiotic dosing. The primary clinical outcome is treatment failure defined as readmission for infection within 30 days of discharge, lack of response to antibiotic regimen, and clinical deterioration after antibiotic initiation. Secondary outcomes to be analyzed include length of stay, 30-day mortality, and microbiological eradication. Safety will be assessed in the study groups by reviewing for any events related to toxicity (i.e. seizures) during the time the antibiotic was administered. Adverse drug events will also be evaluated for all patients admitted to the hospital during the study period using patient safety reporting data. All reports regarding a penicillin or cephalosporin will be reviewed to see if the adverse event was due to dose related toxicity from the antibiotic. Those events will be further investigated to determine if the patient was receiving a weight adjusted antibiotic dose.

Study sample groups, demographics, and results are in the process of being collected. Full results and conclusions will be presented.

ACPE #:0126-9999-13-092-L01-P
Learning Objectives:
- Describe clinical outcomes and safety data for patients receiving weight adjusted penicillins and cephalosporins.
- Explain safe and appropriate weight adjusted doses of penicillin and cephalosporin antibiotics based on data from this retrospective review, physiologic and pharmacokinetic changes in obesity, and current literature.


83 - EVALUATION OF PHARMACIST RECOMMENDATIONS FOR HIGH STROKE RISK ATRIAL FIBRILLATION PATIENTS NOT ON WARFARIN THERAPY
B1. Ambulatory Care

Presented by:

Robert Chirk, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Executive 715
Introduction:
Atrial fibrillation can lead to serious thromboembolic events such as stroke. Risk stratification tools (eg, CHADS2 and CHA2DS2-VASc) are available to aid clinicians in determining optimal therapy. Evidence-based guidelines recommend anticoagulation with medications such as warfarin to decrease thromboembolic events in atrial fibrillation patients who are at a high risk for stroke based on a CHADS2 or CHA2DS2-VASc score of 2 or greater. The guidelines suggest recommendations for optimal therapy, however, patient-specific factors must be taken into account when determining if warfarin therapy is appropriate. Reasons for exclusion from warfarin therapy may include intolerance to warfarin, or a prior history of a serious bleed. Patients previously not treated with warfarin may develop new qualifying risk factors that could change their course of therapy.

Methods:
This project is a retrospective evaluation of an ambulatory care pharmacy program designed to: 1) assess a patient’s stroke risk using CHADS2 and CHA2DS2-VASc scores, and 2) determine if a patient should be reassessed for potential intervention opportunities with warfarin therapy. The patients involved in the program are Kaiser Permanente members from the North Sacramento Valley service area. Inclusion criteria required a diagnosis of atrial fibrillation, no current use of warfarin, and a high risk for stroke based on CHADS2 or CHA2DS2-VASc score of 2 or greater. Patients were identified by utilizing data extraction from electronic medical records. A pharmacist performed chart review was used to validate CHADS2 and CHA2DS2-VASc scores, rule out contraindications to warfarin use, and identify patients with potential intervention opportunities to initiate warfarin therapy. After candidates for potential intervention have been identified, recommendations will be sent to the cardiologist or primary care physician to start warfarin as appropriate.

Results and Conclusions:
The goals of this project are to describe the overall process of the program and to report the anticipated results. Final results and conclusions will be presented when available.

ACPE #:0126-9999-13-093-L01-P
Learning Objectives:
Describe the process in which patients with atrial fibrillation are determined to be at high risk for a stroke and qualify for anticoagulation therapy with warfarin.
Explain the usefulness of recommendations made by ambulatory care pharmacists on clinical outcomes in patients with a high risk for stroke.


84 - EVALUATION OF A PRE-EMPTIVE THERAPY PROTOCOL FOR THE PREVENTION OF CYTOMEGALOVIRUS IN LIVER TRANSPLANTATION
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Tuesday, May 14 at 5:00 PM in Dockside

Introduction:
Prior to May 2012, all liver transplant patients at the University of Washington Medical Center (UWMC) with either recipient or donor cytomegalovirus (CMV) seropositive status received antiviral prophylaxis with valganciclovir for a total of 3 months. Although universal prophylaxis has been shown to be effective at preventing CMV disease, 3 months of valganciclovir therapy is associated with risks for toxicity, antiviral resistance, and substantial cost. A retrospective cohort study was conducted to assess the effectiveness of a recently introduced protocol of pre-emptive therapy (PET) for the prevention of CMV in liver transplant patients. Adherence to monitoring and implementation of protocol-recommended therapy, appropriateness of valganciclovir dosing, incidence of CMV infection and disease, and opportunities for improvements were systematically assessed.

Methods:
This retrospective medical chart review included an analysis of liver transplant patients on PET protocol between May 2012 and January 2013. UWMC is a 450-bed tertiary care, teaching hospital and major organ transplant center conducting an estimated 70 to 100 liver transplants annually. Patient demographic data including age, gender, baseline MELD score, date of transplantation, reason for transplantation, length of inpatient hospital stay after transplantation, and donor CMV status were collected. Weekly quantitative polymerase chain reaction (PCR) results beginning week 2 post-transplantation until week 12 were collected. Data regarding whether the patient received treatment for CMV during the course of 12 weeks post-transplantation were collected on a weekly basis. For patients with positive quantitative CMV PCR results, additional information were collected, including influence of donor CMV serostatus; average time to CMV PCR positivity at any level; average time to CMV PCR > 1,000 copies/mL (or 250 IU/mL); average time to CMV treatment initiation and duration of antiviral treatment; number of patients who developed symptomatic disease. In addition to quantitative data collection, an in depth descriptive analysis was performed regarding the feasibility of PET at UWMC. For patients unable to achieve 100% adherence to PET, chart analyses were performed to investigate possible barriers to adherence documented per staff communication and subsequent clinic visit notes. Results and conclusions of this study will be presented upon completion.

ACPE #:0126-9999-13-094-L01-P
Learning Objectives:
1. Identify practical issues involving the use of pre-emptive therapy for the prevention of cytomegalovirus (CMV) in liver transplantation.
2. Determine the effectiveness of a pre-emptive therapy protocol in the prevention of CMV infection.


85 - TACROLIMUS DOSE OPTIMIZATION IN ALLOGENEIC STEM CELL TRANSPLANTATION
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Stacey Cho, PharmD
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Presenting on Tuesday, May 14 at 10:00 AM in Sunset I
INTRODUCTION:
Patients undergoing allogeneic stem cell transplantation require immunosuppressant therapy to prevent graft-versus-host disease (GVHD). Tacrolimus, a macrolide antibiotic immunosuppressant, is used to prevent GVHD through inhibition of T-cell activation. While effective at preventing GVHD, tacrolimus is associated with significant adverse effects, such as hypertension, electrolyte abnormalities, renal dysfunction, tremors, parasthesias, posterior leukoencephalopathy syndrome (PRES), hemolytic uremic syndrome and gastrointestinal disturbances. Supratherapeutic tacrolimus concentrations increase the likelihood of toxicity. Therapeutic drug monitoring and dose adjustment may reduce the incidence of toxicity.

The UC San Diego Bone Marrow Transplant (BMT) protocol for allogeneic stem cell transplants previously recommended that all patients start tacrolimus at 0.03 mg/kg/day intravenous continuous infusion on day -2 (two days prior to transplant). This initial dosing was based upon literature and tacrolimus dosing protocols at other institutions. A retrospective chart review found that the standard tacrolimus dosing in the UC San Diego allogeneic stem cell transplant population resulted in supratherapeutic tacrolimus concentrations approximately 50% of the time. As a result, the UC San Diego BMT service adopted a new dosing protocol on August 1, 2012. Patients now receive tacrolimus 0.022 mg/kg/day continuous infusion starting 2 days prior to transplantation. The objective of this study is to retrospectively evaluate the new dosing protocol to determine whether this reduces the incidence of supratherapeutic tacrolimus levels during the first 2-4 weeks after transplant.

METHODS:
This study is a retrospective, institution-specific analysis of patients receiving tacrolimus as immunosuppressant therapy for allogeneic stem cell transplants during 2012-2013. Patient demographics, tacrolimus dosing history, and laboratory values will be collected from EPIC electronic medical records. A two group independent t-test will be performed to determine whether the new dosing protocol decreases the incidence of supratherapeutic tacrolimus concentrations in the first 2-4 weeks after stem cell transplantation compared to the previous protocol. Secondary objectives include determining the rates of nephrotoxicity pre- and post-protocol change and externally validating a population pharmacokinetic model for tacrolimus in allogeneic stem cell transplant patients during the first 2-4 weeks after transplantation.

RESULTS AND CONCLUSION: The findings of this study will be presented after completion.

ACPE #:0126-9999-13-095-L01-P
Learning Objectives:
- Explain the role of tacrolimus in graft-versus-host disease prevention following allogeneic stem cell transplantation.
- List potential adverse effects associated with supratherapeutic tacrolimus concentrations.

Introduction & Purpose:
Heparin-Induced Thrombocytopenia (HIT) is an anticoagulant induced prothombotic, immune-mediated complication defined as either an acute thrombocytopenia with a platelet count of <100,000/mm3 or a ≥50% drop in platelet from baseline between days 5-14 of heparin exposure. Prompt diagnosis of HIT, and if necessary, initiation of Direct Thrombin Inhibitor (DTI) treatment is critical. However, diagnosis is challenging due to many potential etiologies of thrombocytopenia, and is often delayed. Additionally, treatment decisions are further complicated because DTIs: have no antidotes, can lead to bleeding, and are very costly.

A pretest clinical scoring system called 4T’s was developed to assess the likelihood of HIT prior to laboratory testing results, and is used to classify patients as low-, intermediate-, or high-probably of HIT. A low 4T’s score of 0 to 3 indicates a very low likelihood of HIT and suggest continued use of heparin. Laboratory testing is not recommended due to increased likelihood of false positive results. In patients with intermediate 4T’s score of 4-5 or high 4T’s score of 6-8, discontinuation of all heparin products and laboratory testing is recommended to further direct therapy. DTI therapy is also warranted unless otherwise contraindicated, while awaiting laboratory results.

4T’s scoring has been shown to be a practical and safe approach for rapid HIT diagnosis and management. The aim of this study is to validate the 4T’s pretest clinical scoring system by comparing 4T’s classifications with subsequent laboratory test results, and to ultimately develop a guideline that can be employed at this medical institution.

Methods:
This is an institutional review board approved retrospective chart review of Loma Linda University Medical Center patients who had clinical suspicion of HIT and received argatroban from July 2008 to July 2012. 4T’s score will be applied to each patient meeting the inclusion criteria and stratified into three groups based on their scores (low-, intermediate-, or high-risk). Clinical scores will then be compared to corresponding lab result to determine if the 4T’s score correlates with laboratory results. The primary endpoint is to determine if the calculated 4T’s scores can be used to predict laboratory results.

Results & Conclusion:
Will be presented upon completion

ACPE #:0126-9999-13-096-L01-P
Learning Objectives:
Describe how the 4T’s score can be utilized to assess the likelihood of HIT.
Explain how the 4T’s score can be used to develop a guideline to systematically evaluate HIT and initiate argatroban.


87 - THE DEVELOPMENT AND EVALUATION OF CLINICAL PHARMACY TECHNICIANS IN THE SAFETY NET CLINICS
B1. Ambulatory Care

Presented by:
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Presenting on Tuesday, May 14 at 3:30 PM in Executive 715
In the ambulatory care setting, clinical pharmacists have a number of tasks to complete in addition to providing comprehensive medication management. Some of the tasks may include reminder appointment calls, filling pillboxes, creating medication adherence lists and scheduling follow up or laboratory visits. That being the case, clinical pharmacists are not working at the highest training level and maximizing the appointment time with patients. Pharmacy technicians are key members in the pharmacy team to assist the pharmacist in a variety of duties and to maintain workflow. Traditionally, pharmacy technicians are limited to management of pharmacies and dispensaries. A few healthcare institutions have pilot programs utilizing technicians in new responsibilities such as performing medication reconciliation lists, interviewing patients to obtain medical histories and screening information for data-management. By performing these additional projects, pharmacists’ time were freed up. The expansion of patient care-related roles for pharmacy technicians will establish new roles and standards for the clinical pharmacy team.

The purpose of this project is to describe the development and evaluation of clinical pharmacy technicians in the safety net clinics. Clinical pharmacy technicians will be trained in clerical and clinical responsibilities to be performed while under the supervision of a clinical pharmacist. By doing so, the clinical pharmacy technicians enabled the clinical pharmacists to utilize more time towards patient encounters and assisting providers with medication related problems. The results of this project will improve patient care quality and efficiency of pharmacy services provided from the clinical pharmacy teams to safety net clinic patients and providers. Final results and conclusions will be presented and discussed.

ACPE #:0126-9999-13-097-L04-P

Learning Objectives:
- Describe the expansion of clinical responsibilities for pharmacy technicians.
- Explain how to develop and train clinical pharmacy technicians in the safety net clinic.


88 - EFFECT OF EZETIMIBE ON CARDIOVASCULAR OUTCOMES WHEN ADDED TO A HIGH-DOSE STATIN REGIMEN
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
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Presenting on Tuesday, May 14 at 9:30 AM in Royal V

Several studies have shown that ezetimibe is beneficial in reducing low-density lipoprotein (LDL), especially when used in combination with a HMG-CoA reductase inhibitor (“statin”). However, more recent data indicates that it also increases carotid intima media thickness, which is a surrogate marker for atherosclerosis progression. This has raised the question of whether or not ezetimibe provides clinical benefit in reducing morbidity and mortality. There are no studies that have evaluated the impact of ezetimibe alone or as add-on therapy in terms of reducing cardiovascular outcomes. The goal of this project was to determine if there is a clinical benefit to the use of ezetimibe in combination with a high-dose statin regimen for hyperlipidemic patients at Kaiser Permanente East Bay. The study design was a retrospective matched cohort study comparing patients who are currently or were previously taking a high-dose statin regimen (simvastatin 80mg, atorvastatin ≥ 40mg, or rosvavastatin ≥ 10mg) plus ezetimibe vs. patients from the same population who are currently or were previously
taking a high-dose statin regimen alone. The study was conducted between the months of October 2012 to February 2013 and included a total of 520 patients (260 per group). The primary outcomes were the rate of cardiovascular adverse events (stroke, myocardial infarction, or death due to stroke/myocardial infarction) in both groups, and the extent of LDL reduction by ezetimibe. Results of this study are pending.

ACPE #:0126-9999-13-098-L01-P
Learning Objectives:
 Explain whether or not ezetimibe, when added to a high-dose statin regimen, reduces cardiovascular events.
 Describe the extent of LDL reduction by ezetimibe and how accurately it reflects that seen in clinical trials.


89 - EVALUATION OF THE INCIDENCE OF HYPERKALEMIA IN PATIENTS PRESCRIBED SPIRONOLACTONE FOR RESISTANT HYPERTENSION
B1. Ambulatory Care

Presented by:
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Presenting on Tuesday, May 14 at 4:00 PM in Executive 715

INTRODUCTION
Resistant hypertension (HTN) is defined as a blood pressure of at least 140/90 mmHg or at least 130/80 mmHg in patients with diabetes or chronic kidney disease (CKD), despite adherence to treatment with optimal doses of at least three anti-hypertensive agents, including a diuretic if possible. Aldosterone receptor antagonists, such as spironolactone, provide additional antihypertensive benefit when added to a three or four-drug regimen for management of resistant HTN.

Spironolactone is also FDA approved for severe heart failure (New York Heart Association class II-IV) to increase survival and reduce hospitalization when added to standard therapy. The Randomized Aldactone Evaluation Study (RALES) demonstrated that spironolactone significantly improves outcomes in patients with severe heart failure. An early-dose finding study conducted by the RALES investigators found that hyperkalemia (K+ greater than 5.5 mmol/L) was a dose-dependent effect of spironolactone. A population-based analysis has associated the publication of RALES with an increase in the number of prescriptions for spironolactone and corresponding increase in hyperkalemia-associated morbidity and mortality. A subsequent retrospective analysis has shown a trend in increased reporting frequency of spironolactone-associated hyperkalemia coinciding with the publication of RALES.

The investigators of the current study aim to evaluate the incidence of hyperkalemia in a different patient population—resistant HTN—to determine whether findings are consistent with data in the current literature. In addition, the investigators aim to identify patient specific parameters associated with an increased risk of developing hyperkalemia.

METHODOLOGY
The current study is a retrospective, observational study evaluating the incidence of hyperkalemia in patients prescribed spironolactone for resistant hypertension. Patients at the University of Colorado Hospital from
January 1, 2011 through June 30, 2012, who were exposed to spironolactone and prescribed greater than or equal to three antihypertensives who have not achieved individual blood pressure goal were included in the study.

The primary outcome is incidence of hyperkalemia (defined as serum potassium greater than 5.5 mmol/L). Secondary outcomes include incidence of hyperkalemia resulting in discontinuation of spironolactone, incidence of ED visits and hospital admissions related to hyperkalemia associated with spironolactone use, and change in serum potassium pre and post initiation of spironolactone. Tertiary outcomes include overall discontinuation rate of spironolactone and incidence of severe hyperkalemia (defined as K+ greater than 6 mmol/L).

RESULTS
Data collection and analysis is currently being conducted.

CONCLUSION
Pending analysis of results.

ACPE #:0126-9999-13-099-L01-P
Learning Objectives:
Explain the role of spironolactone in the management of resistant hypertension.
List patient specific factors associated with an increased risk of hyperkalemia.


90 - DRIVERS OF SUBOPTIMAL ANTICOAGULATION CONTROL – A PROCESS IMPROVEMENT APPROACH TO BETTER CARE
B1. Ambulatory Care

Presented by:
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Presenting on Tuesday, May 14 at 4:30 PM in Executive 715

Anticoagulation therapy with warfarin has been known to be complex to manage due to its narrow therapeutic index, drug-drug and drug-food interactions, frequent lab visits, frequently adjusted dosing along with other factors. The time in therapeutic range (TTR) is a commonly used outcome measure to assess the quality of warfarin anticoagulation therapy management where low TTR has been associated with increased risk of thromboembolism and bleeds that may potentially result in costly hospitalizations, permanent disabilities and even death. Studies have suggested that TTR <60% is considered suboptimally controlled, TTR 60-75% is considered moderately controlled and TTR >75% is considered well controlled.

In this retrospective study, the objective is to identify factors that may be contributing to suboptimal anticoagulation control in the non-valvular atrial fibrillation (AF) population of South Bay Kaiser Permanente's Anticoagulation Service. Findings from the study can be used to make objective modifications to the current workflow that can yield improvements in TTR. Using the electronic medical record of Kaiser Permanente, non-valvular AF patients with TTR ≤50% and ≥75% between November 2011 and April 2012 were identified for comparison. Patients who started warfarin or had invasive procedures during the study time frame were excluded. Factors that may contribute to suboptimal anticoagulation control were selected as primary endpoints for comparison between the two groups. Primary endpoints include pharmacist management of warfarin regimen noncompliance, delays to lab follow up, specific comorbid disease states and drug-drug interactions.
Chi square tests were conducted to investigate if statistically significant differences exist in the selected primary endpoints between the two groups. The study results and conclusions will be presented.

ACPE #:0126-9999-13-100-L01-P
Learning Objectives:
  Describe possible factors that may be contributing to suboptimal anticoagulation control with warfarin
  List possible solutions that may yield improvements in time in therapeutic range (TTR)


91 - EVALUATION OF PNEUMONIA CORE MEASURE ADHERENCE AND CLINICAL OUTCOMES PRE- AND POST- COMPUTERIZED PHYSICIAN ORDER ENTRY
A1. Infectious Disease - Anti-infective Agents

Presented by:
Juliane Christina, PharmD
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Presenting on Tuesday, May 14 at 8:00 AM in Garden

Introduction:
In 2007, the Infectious Diseases Society of America (IDSA) and American Thoracic Society (ATS) published consensus guidelines on the management of community-acquired pneumonia in adult patients. These guidelines were utilized by the Centers for Medicare and Medicaid Services (CMS) in order to develop quality measures to assure optimal care of patients admitted with pneumonia. With the implementation of Computerized Physician Order Entry (CPOE) at Scottsdale Healthcare, a pneumonia admission order set has been revised and implemented to align with the CMS pneumonia core measure. The use of guideline concordant antibiotics for the treatment of pneumonia has been associated with improvement in clinical outcomes in several studies. The main purpose of this study is to evaluate the compliance with CMS core measure antibiotic selection in hospitalized patients pre- and post- CPOE implementation and its impact on clinical outcomes. Among the antibiotics choices that meet the CMS pneumonia core measure criteria, respiratory fluoroquinolones are commonly used. However, the widespread use of this agent has been associated with increased bacterial resistance. The study also aims to assess the impact of variation in empiric first-line therapy (3rd generation cephalosporin plus macrolide compared to a respiratory fluoroquinolone) on clinical outcomes.

Methods:
This retrospective study included patients admitted to the Scottsdale Healthcare system due to pneumonia. Patients were identified using ICD-9 codes as part of the electronic medical record. Approximately 100 patients each were included in the pre- and post-CPOE implementation groups. To be included in the study, patients must have a primary diagnosis of pneumonia, have been admitted to an inpatient unit, and be between the ages of 18 and 75. Patients were excluded if they exhibited immunosuppression (HIV/AIDS, receiving chemotherapy, or other causes). The following data was collected: patient age, gender, allergies, renal function, comorbidities, admitting location (ICU or non-ICU), pneumonia severity, initial antibiotics, culture, serology, concurrent infections, and other antibiotics used. The primary outcome is compliance rate between pre- and post- CPOE implementation groups regarding the appropriate selection of antibiotics based on the CMS core measure. The secondary outcomes included: total hospital length of stay, time to resolution of signs and symptoms of infection, 30-day readmission, and mortality. Additionally, the secondary outcomes listed earlier were compared
between patients receiving empiric treatment with either a 3rd generation cephalosporin plus a macrolide or a respiratory fluoroquinolone.

Results and Conclusion: To be presented at 2013 Western States Residency Conference

ACPE #:0126-9999-13-101-L01-P

Learning Objectives:
1. Describe the impact of guideline concordant antibiotics for pneumonia on clinical outcomes, including length of stay and mortality
2. Explain the risk and benefit of different antibiotic choices of empiric first-line therapy for pneumonia (specifically cephalosporin plus macrolide compared to a respiratory fluoroquinolone)


92 - WARFARIN REVERSAL FOR INTRACRANIAL HEMORRHAGE USING AN INSTITUTIONAL PROTHROMBIN COMPLEX CONCENTRATE PROTOCOL

B3. Critical Care

Presented by:
Cherie Chu, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Executive 715

WARFARIN REVERSAL FOR INTRACRANIAL HEMORRHAGE USING AN INSTITUTIONAL PROTHROMBIN COMPLEX CONCENTRATE PROTOCOL (B3). Cherie Chu. Sheri Tokumaru. Kara Izumi. Kazuma Nakagawa. University of Hawaii at Hilo College of Pharmacy and The Queen’s Medical Center, Honolulu, HI. (chucheri@hawaii.edu) IRB approval pending.

Warfarin is a well established anticoagulant for the prevention and treatment of venous and arterial thrombus. It is also consistently among the ten most common drugs for which serious adverse events are reported. Studies have shown that the rate of warfarin associated fatal bleeding, such as intracranial hemorrhage (ICH), is approximately 1% annually and 76% of those cases resulted in death or severe disability. The current American College of Chest Physician Guidelines recommends the use of Prothrombin Complex Concentrate (PCC) when warfarin associated major bleeding warrants rapid reversal. PCCs provide a low volume and rapid method of correcting international normalization ratio (INR) values within 30 minutes of administration. The exact dose is calculated according to body weight, degree of INR prolongation and the desired level of correction. This calculation can be complicated, time consuming, impractical and potentially wasteful as each vial of PCC can contain varying amounts of international units. The Queen’s Medical Center (QMC) has developed and is utilizing a simplified weight based protocol for PCC (Profilnine®) dosing and administration. This protocol categorizes patients by weight to receive 1, 2 or 3 vials of PCC. For some patient cases, reversal after the first dose of PCC is unsuccessful, warranting repeat doses of PCC and or other forms of reversal. It is unknown if patient specific factors play a role in unsuccessful reversal with PCC. The primary objectives of this study are to determine if the QMC PCC protocol is effective with respect to adequate reversal after the first dose and if reversal was unsuccessful, to stratify the possible causes of failure. The secondary objective is to assess compliance to the protocol with respect to monitoring and administration of additional PCC, if indicated or not. Other data to be collected include demographics, administration of vitamin K or FFP, VTE occurrence and survival after PCC administration. The primary outcomes measured were the successful reversal of INR after first
dose of PCC. If reversal was unsuccessful, patient specific factors were summarized using descriptive statistics appropriate to variable type. Compliance with the current protocol was also assessed by reviewing documentation of the appropriate labs and use of additional reversal agents, if warranted. A retrospective review of patients admitted to QMC, requiring warfarin reversal with PCC for ICH from any cause was done from 1/1/10 to 12/31/12. All patients over the age of 18 years who received at least one dose of PCC, had a diagnosis of ICH; and have been on warfarin therapy prior to admission were included. Patients who received PCC for any other cause were excluded. Results and conclusions will be presented.

ACPE #:0126-9999-13-102-L01-P

Learning Objectives:
- Describe the difficulties faced when determining the dose of PCC for emergent warfarin reversal
- List patient specific factors that may affect the adequate reversal of warfarin in ICH patients using a weight based PCC protocol


93 - REVIEW AND UPDATE COMPOUNDING PROCESS FOR COMMONLY PREPARED OPHTHALMIC SOLUTIONS AT UC IRVINE MEDICAL CENTER

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Eric Chu, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Sunset III

Introduction: Many variables come into play when compounding ophthalmic products such as clarity, pH, tonicity, viscosity, compatibility, stability, and sterility. However, the availability of information in the literature in regards to compounded ophthalmic products is limited in the number of published formulations available for reference. The goal of this study is to create a standardized formulation for commonly compounded ophthalmic products at our institution. A beyond use date will be determined for each of the newly developed ophthalmic compounding formulations based on data in the literature and/or data collected via testing by an outside laboratory.

Methodology: Working with our ophthalmologists, we first compiled a working list of commonly used ophthalmic products at our institution: Acetylcysteine 10%, Amphotericin B 0.1% (conventional), Cefazolin 5%, Ceftazidime 5%, Gentamicin 1.4% (fortified), Tobramycin 1.5% (fortified), Vancomycin 2.5% & 5%, and Voriconazole 1%. Next, perform a literature search for information pertaining to published ophthalmic compounding formulations and any available data associated with their stability and sterility. Based on the information gathered and the requirements outlined in U.S. Pharmacopeia (USP) 797, revise our current compounding process for the various ophthalmic products. Test selected ophthalmic products (Cefazolin 5%, Ceftazidime 5%, Tobramycin 1.5%, and both Vancomycin 2.5% & 5%), specially prepared following the updated compounding process, for potency, sterility, fungal, and endotoxin at various pre-determined testing points. Based on the results from testing by an outside laboratory and data in the literature, the newly developed ophthalmic compounding formulations will be finalized with an appropriate beyond use date. Ophthalmic products not tested (Acetylcysteine 10%, Amphotericin B 0.1%, Gentamicin 1.4%, and Voriconazole 1%) were deemed to have sufficient evidence to support their beyond use dating from published data. The finalized
version of each formulation for the various ophthalmic products will then be compiled in an online electronic database for pharmacy use. Lastly, an in-service regarding the new ophthalmic compounding process will be conducted for all pertinent pharmacy staff prior to implementation.

Results/Conclusion: Results currently pending and will be presented when available. Implementation of the new ophthalmic compounding process at our institution will ensue after all data are reviewed and compounding sheets updated accordingly.

ACPE #:0126-9999-13-103-L01-P

Learning Objectives:

- List important parameters to consider when formulating products for ophthalmic use
- Describe the general requirements outlined in U.S. Pharmacopeia (USP) 797 in regards to beyond use dating for compounded sterile products


94 - EVALUATION OF THE EFFECT OF INSULIN INFUSION TRANSITION TO SUBCUTANEOUS INSULIN ORDER SETS ON QUALITY MEASURE COMPLIANCE

C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

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Presenting on Tuesday, May 14 at 8:30 AM in Palm II

Postoperative hyperglycemia is a serious risk factor associated with poor mortality and morbidity outcomes in cardiac surgery patients, regardless of their diabetic status. Therefore, postoperative blood glucose control is a quality measure included in the Surgical Care Improvement Project (SCIP) for the National Hospital Inpatient Quality Measures (NHIQM). Specifically, SCIP-Inf-4 measures cardiac surgery patients with controlled 6 A.M. blood glucose (<200 mg/dL) on postoperative day one and postoperative day two.

Blood glucose control is better achieved with continuous insulin infusions (CIIs) compared to intermittent subcutaneous (SQ) insulin injections. Recommendations for the duration of CIIs vary from ≥24 hours to ≥72 hours postoperatively, and before CIIs are discontinued, patients should be transitioned to a SQ insulin regimen using institutional protocols. This study aims to determine whether or not the use of CII to SQ insulin transition order sets improve compliance with the SCIP-Inf-4 quality measure and blood glucose control from postoperative day zero through postoperative day two.

The study will include patients at three Sharp HealthCare hospitals who were identified by the Quality Department as having qualified under the Surgical Care Improvement Project Measure – Cardiac Surgery Patients with Controlled 6 A.M. Postoperative Blood Glucose (SCIP-Inf-4). A retrospective chart review of electronic medical records will be conducted to determine transition order set utilization and its effect on quality measure compliance, blood glucose control, intensive care unit (ICU) lengths of stay, and hospital lengths of stay, as well as any risk factors that may affect blood glucose control. The primary endpoint will be the achievement of the SCIP-Inf-4 quality measure. Secondary endpoints include average daily blood glucose measurements and ICU and hospital lengths of stay. Results of the study can be used to improve and
standardize the transition order sets throughout the Sharp HealthCare System. Results and conclusions will be presented.

ACPE #:0126-9999-13-104-L01-P
Learning Objectives:
Describe the impact of order set utilization on quality measure compliance and blood glucose control.
Describe strategies for transitioning patients from continuous insulin infusions to subcutaneous insulin regimens.


95 - EVALUATING BOCEPREVIR- OR TELAPREVIR-BASED THERAPY FOR HEPATITIS C GENOTYPE 1 INFECTION WITHIN THE VETERAN POPULATION
A1. Infectious Disease - Anti-infective Agents

Presented by:
Joshua Chua, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Garden

National guidelines indicate that the standard of care for patients with chronic hepatitis C virus (HCV) genotype 1 infection include an HCV NS3/4 protease inhibitor, boceprevir or telaprevir, in addition to peginterferon and ribavirin. In randomized, controlled clinical trials, boceprevir- or telaprevir-based therapy achieved a sustained virologic response (SVR) in 63-75% of treatment-naïve patients, 69-88% of relapers to peginterferon-ribavirin, and in up to 33% of non-responders to peginterferon-ribavirin. The purpose of this study is to evaluate the use of boceprevir- or telaprevir-based therapy within the veteran population at the San Francisco Veterans Affairs Medical Center (SFVAMC) compared to the reported efficacy, safety, tolerability data and discontinuation rates published in the clinical trials. A retrospective chart review of chronic hepatitis C genotype 1-infected patients who received boceprevir- or telaprevir-based therapy between July 1, 2011 and September 30, 2012 was completed. Patient demographics, medical and social history, liver imaging and biopsy results, and the patient’s prior history of HCV treatment were collected. Laboratory data collected included HCV RNA levels, liver function tests, CBC with differential and other routine tests necessary for treatment monitoring. The patient’s treatment response, incidence of adverse drug events, morbidity and mortality outcomes were collected to determine the efficacy and safety of boceprevir- or telaprevir- based treatments within the veteran population at SFVAMC. Descriptive statistics were generated for continuous variables and for categorical variables. Comparison of categorical variables were performed using the chi-square or Fisher’s exact test, as appropriate. Results will be presented.

ACPE #:0126-9999-13-105-L01-P
Learning Objectives:
Describe the treatment outcomes of boceprevir- or telaprevir-based HCV genotype 1 therapy within the veteran population at the San Francisco Veterans Affairs Medical Center.
Describe the adverse drug event rates of boceprevir- or telaprevir-based HCV genotype 1 therapy within the veteran population at the San Francisco Veterans Affairs Medical Center.
96 - CHARACTERISTICS OF PATIENTS ON INHALED CORTICOSTEROIDS (ICS)/LONG-ACTING BETA AGONISTS WITHOUT ICS USE IN 3 YEARS OR MORE

B1. Ambulatory Care

Presented by:

Jasmine Chung, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Executive 715

Introduction: For mild persistent asthma uncontrolled by short acting beta-2 agonists (SABA) alone, treatment guidelines from the National Asthma Education and Prevention Programs’ Expert Panel Report-3 recommend the use of low-dose inhaled corticosteroids (ICS) first before adding a combination ICS/long-acting beta agonist (LABA). Since there are FDA black box warnings for all ICS/LABA products for increased asthma-related deaths when LABAs are added to asthma therapy, combination products are generally only recommended for patients inadequately controlled on ICS monotherapy. With the introduction of new combination ICS/LABA products to the market, recent drug utilization trends have shown more prescribing of ICS/LABA medications, even in patients who have not had a history of ICS in the past few years or who were ICS-naive. Therefore, the objective of this study was to analyze patient characteristics and asthma control of adult asthmatic patients who had no history of ICS use in the past three years and were initiated on ICS/LABA products (fluticasone/salmeterol, mometasone/formoterol, or budesonide/formoterol) and describe any trends noticed.

Methodology: Study data was acquired from Kaiser Permanente Northern California region medical records. Patients included were between ages 18-45 and had been prescribed an ICS/LABA combination between July 2011 and December 2011 and had no history of ICS use in the last three years. Exclusion criteria included (1) COPD diagnosis and (2) patients without a 1-year baseline asthma history before the date they were prescribed a combination medication (index date). Chart review was conducted to assess baseline patient characteristics and asthma control (SABA use, asthma-related prednisone use, asthma-related emergency department/hospitalizations in the year prior to and post-ICS/LABA prescription). Symptoms present upon index date were assessed. Furthermore, follow-up visits and step-down attempts after the index date were reviewed. Results and conclusion are pending to be presented.

ACPE #:0126-9999-13-106-L01-P
Learning Objectives:
Describe patient characteristics of those who are prescribed combination ICS/LABA medications without having a history of ICS use in at least three years.
Describe medical practice trends and follow-up in the prescribing of combination ICS/LABA medications.

97 - THE VALUE OF A PHARMACIST ON PEDIATRIC CARDIOLOGY ROUNDS

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Background: Recent shifts in healthcare have emphasized the importance of cost-minimization within hospital organizations. With this change, pharmacy administrators are pressed to justify pharmacist positions through cost-effectiveness analysis. The value of a pharmacist in the intensive care unit (ICU) is well described in the literature, leading to both a reduction in adverse drug events and significant drug-cost savings. However, demonstrating the value of a pharmacist on a general medicine team has not been described. Various factors contribute to the difference between demands for an ICU and general medicine pharmacist, including a reduced number of medications per patient and the relative hemodynamic stability of general medicine patients compared to ICU patients. The purpose of this study is to evaluate, both descriptively and through a cost-effectiveness analysis, the value of a pharmacist on a pediatric cardiology team.

Methods: A pharmacy resident participated on multidisciplinary pediatric cardiology team rounds for two months. All clinical interventions were recorded, and daily time allotments were documented for all tasks. Using a method described by Leape and colleagues, the cost-savings in prevention of adverse drug events and direct drug and laboratory cost savings were assessed. Other cardiology team members completed an anonymous survey assessing their perception of the pharmacist’s added value to the team.

The primary outcome of this study is the economic evaluation of having a pharmacist on the pediatric cardiology team. Secondary outcomes include descriptions of the types of interventions made, pharmacist time allotted to clinical duties, and the cardiology team members’ assessment of the role of a pharmacist on the team. Results and discussion will be presented.

References:

ACPE #:0126-9999-13-107-L01-P

Learning Objectives:
- Describe a method to validate the pharmacist’s economic value on an inpatient pediatric cardiology service.
- Identify key areas where pharmacists can be most helpful on general medicine teams.

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Presenting on Tuesday, May 14 at 10:00 AM in Executive 715

Introduction: Vasospasm secondary to aneurysmal subarachnoid hemorrhage (aSAH) is a complication with a frequency as high as 30-70%. Morbidity and mortality associated with this complication is also very high due to ischemia and infarction. The risk for vasospasm is highest approximately 3-14 days after aSAH. Monitoring for vasospasm includes close and repeated neurologic exams in conjunction with either radiographic (ex. intra-arterial digital subtraction angiography (DSA)) or physiological monitoring modalities (ex. Transcranial Doppler (TCD)).

Existing treatments for vasospasm include percutaneous intraarterial angioplasty or intraarterial administration of vasodilators. The use of intraventricular calcium channel blockers (CCBs), such as nicardipine, has also been explored for the treatment of vasospasm in animal models and recently in a limited number of human cases. Bedside administration of intraventricular nicardipine would provide another measure to treat vasospasm and could be particularly advantageous in the most critically ill patients that might be too unstable for angioplasty. The benefits, potential adverse events, and experience of using this intervention in the clinical setting have not been largely explored.

Objectives: To evaluate both the safety and effectiveness of intraventricular nicardipine in the setting of vasospasm secondary to aneurysmal subarachnoid hemorrhage.

Methods: This IRB approved study was designed as a retrospective review from July 1, 2009 through October 29, 2012 of twenty-five intraventricular nicardipine cases matched to historical controls to compare the safety and effectiveness of this intervention with those not treated with the intervention. Safety endpoints will include: rates of meningitis, intracranial pressure (ICP) readings greater than 20 mm Hg, and rates of headache, nausea, and seizure. Intensive care unit (ICU) clinical endpoints will include: disposition status at hospital discharge, number of large vessel angioplasties, ventilator days, ICU length of stay, average fluid balance per day in the ICU and cumulative days of vasopressor therapy. Statistical analysis will be measured by utilization of the Chi square test for nominal data and the Student’s t-test for continuous data.

Results and conclusion: Currently, results and conclusions are pending and will be presented.

ACPE #:0126-9999-13-108-L01-P
Learning Objectives:

- Explain the rationale of utilizing intraventricular nicardipine in the aneurysmal subarachnoid hemorrhage population.
- Describe adverse events including meningitis, nausea/vomiting and headache found in this retrospective study.


99 - ADDITION OF PHARMACIST-DIRECTED MEDICATION MANAGEMENT IN 30-DAY, RE-ADMISSION REDUCTION PROGRAM

B4. General Clinical Practice

Presented by:

Lisa Co, PharmD
Desert Regional Medical Center
PURPOSE:
Statistics demonstrate 20% of all hospitalized patients will be readmitted within 30 days. In turn, re-hospitalization increases a patient’s overall morbidity and mortality. Patients with prior hospital readmissions, multiple chronic co-morbidities, and increasing age are considered at risk for future hospital re-admissions. Early studies have identified several areas of interest that may potentially impact an institution’s re-admission rate: discharge planning, medication reconciliation, and transitions of care.

In October 2012, Desert Regional Medical Center’s (DRMC) case management team implemented a “transitions of care” program in conjunction with Riverside County Social Services to improve the quality of care after hospitalization in high-risk patients. The Pharmacy Services department collaborated with case management to pilot a pharmacist-driven, medication reconciliation and discharge counseling program to increase the quality of post-discharge care. The objectives of this program are to (1) reduce medication reconciliation errors, (2) improve patient understanding of his/her health status, (3) reduce re-hospitalization, and (4) increase the role of the Clinical Pharmacist in medication reconciliation.

METHODS:
This study did not require submission to the Bioethics Committee or the Institutional Review Board for approval. All treatment recommendations, medication adjustments, and patient counseling by the Clinical Pharmacist followed current DRMC policies and procedures as approved by interdisciplinary P&T review. Patients were selected for the program if the prior hospitalization was within 30 days. Exclusion criteria included admissions due to trauma, pregnancy/labor, and complications secondary to malignancy.

Riverside County Social Services liaison enrolled patients for post-discharge follow-up with patient consent. Follow-up visits included discharge medication overview, identifying and reducing environmental health hazards, and coordinating physician visits. The Clinical Pharmacist performed thorough medication reconciliation within 24 hours of admission, discharge medication reconciliation and patient medication counseling. Interventions performed by the Clinical Pharmacist included dose adjustments, regimen clarifications, alternative therapies, adjunctive therapies, and drug-drug interaction identifications. All interventions not under pharmacy protocol were communicated to the appropriate physician for consideration. Data collected and analyzed included: (1) number of re-hospitalizations, (2) number of interventions, (3) type of intervention, and (4) number of follow-up visits.

RESULTS:
Preliminary results will be presented at the conference

ACPE #:0126-9999-13-109-L01-P
Learning Objectives:
Describe ways to increase the role of the Clinical Pharmacist in medication reconciliation at a community, inpatient setting
Describe methods that can reduce re-hospitalization and medication reconciliation errors


**100 - EVALUATION OF CLINICAL DASHBOARD MANAGEMENT BY A CLINICAL PHARMACIST ON LDL AND A1C PERFORMANCE MEASURE SCORES**
B1. Ambulatory Care

Presented by:
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Presenting on Tuesday, May 14 at 2:00 PM in Executive 713

At the San Francisco Veterans Affairs Medical Center (SFVAMC), providers can easily access their performance measure scores through an online database called the Pharmacy Benefits Management (PBM) Dashboard. Since January 2012, the San Bruno Community Based Outpatient Clinic (CBOC) clinical pharmacist began utilizing the PBM Clinical Dashboard to explore ways to improve the LDL and A1c performance measure scores at the CBOC. After each review, the pharmacist engages different members of the primary care team, including physicians, nurses, and clerks to help improve the performance measure scores. The purpose of this retrospective chart review is to evaluate the effectiveness of a pharmacist using the clinical dashboard as a tool for identifying patients to help improve LDL and/or A1c performance measure scores. This study will include all patients identified through the clinical dashboard between 8/1/12 and 1/31/13. Data collected will include: patient baseline characteristics, number and types of recommendations made by the clinical pharmacist, members of the team assigned to complete each recommendation, and the percentage of patients that completed recommendations by the end of the data collection period. Finally, we will be assessing the percentage of performance measure scores that improved from a failing to passing score over the course of the study period. Descriptive statistics will be used to analyze the data. The results and conclusions of this study will be discussed.

ACPE #:0126-9999-13-110-L01-P
Learning Objectives:
- Describe the utility of performance measure scores.
- Describe the role of the pharmacist in helping physicians meet performance measure scores.


101 - EFFECT OF ANTIPSYCHOTIC MEDICATIONS ON DELIRIUM IN A TRAUMA INTENSIVE CARE UNIT
B3. Critical Care

Presented by:
Dmitri Cohen, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Executive 715

Introduction:
Studies suggest that up to 80 percent of Intensive Care Unit (ICU) patients experience delirium. Routine screening allows for early and appropriate diagnosis. Recent guidelines focus on managing ICU patients with pain, agitation, and delirium; however, few studies have included Trauma ICU (TICU) patients. Recent evidence suggests that treatment of delirium with atypical antipsychotics may reduce duration of delirium. Currently, delirium screening is not the standard of care in the TICU at University Medical Center of Southern Nevada
The objective of this study was to determine the frequency of delirium and to evaluate the effect of antipsychotic medications on delirium in TICU patients at UMCSN.

Methods:
This prospective, observational, two phase, single center study evaluated the effect of antipsychotic medications in TICU patients. The baseline phase of the study was a three month evaluation of the frequency of delirium in the TICU. Nurses would evaluate patients in the TICU using the Richmond Agitation-Sedation Scale and Confusion Assessment Method. During the observation phase, physicians were blinded to the nurses’ evaluations. After the delirium baseline was established, the evaluation phase was initiated. The evaluation phase was a three month assessment of the effect of antipsychotic medications on delirium frequency. During the evaluation phase, nurses would continue to assess patients and would reveal their assessments to the unit’s physicians. After appropriate patient medical review, if delirium was present, physicians were encouraged to initially provide non-pharmacologic interventions, followed by antipsychotic medications from the institution’s formulary (e.g. haloperidol, olanzapine, or quetiapine). The primary endpoint for this study was the change in the number of delirium-free days between the observation phase and the evaluation phase. Secondary endpoints included: ventilator-free days, length of days in the TICU and hospital, use of benzodiazepines, propofol, opiates, dexmedetomidine, steroids, and antipsychotics, and all-cause in-hospital mortality. Patients were included if they were admitted to the TICU. Patients who met any of the following criteria were excluded: TICU admission less than 24 hours in length, vision and/or hearing deficit, inability to speak English, less than 18 years or greater than 75 years of age, intracranial hemorrhage/hematoma, Child-Pugh score greater or equal to B, prolonged QTc interval on admission, or actively withdrawing from a substance.

Results/Conclusions:
To be presented.

ACPE #:0126-9999-13-111-L01-P
Learning Objectives:
1. Describe the steps to evaluate a patient for delirium in an ICU setting
2. Explain pharmacotherapy options for delirium management


102 - A RETROSPECTIVE MULTIVARIATE ANALYSIS TO IDENTIFY FACTORS ASSOCIATED WITH ACUTE KIDNEY INJURY IN A TERTIARY PEDIATRIC HOSPITAL
B6. Pediatric or Gender Specific Care

Presented by:
Joanna Collins, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Sunset II

Introduction:
Acute kidney injury (AKI) is characterized by a sudden deterioration in renal function and is associated with short and long term adverse outcomes in pediatric patients. AKI has been found to have increased mortality, length of hospital stay and resource utilization among hospitalized pediatric patients. In addition, infants undergoing congenital heart surgery who suffer perioperative AKI have also shown poorer clinical outcomes.
Nephrotoxins have been found to be the second leading cause of AKI after ischemia but due to the many factors contributing to an AKI event it is often difficult to determine the cause. It is estimated that of the pediatric patients who suffer AKI due to nephrotoxins only 77% survive, and those who do survive may have a higher incidence of long term renal injury and death. In a recent study, a majority of pediatric patients experiencing AKI after exposure to nonsteroidal antiinflammatory agents were given the correct dose. This demonstrates the uncertainty regarding the factors that can precipitate AKI in this population.

Due to the devastating effects of AKI on pediatric patients it is important to identify risk factors, especially nephrotoxic agents that can precipitate AKI in hopes of preventing future morbidity and mortality. This study aims to identify patient, medication and disease factors that contribute to the occurrence of AKI in a tertiary pediatric hospital.

Methodology:
This study is a retrospective multivariate analysis at a tertiary pediatric hospital. All patients admitted to Seattle Children’s Hospital between August 1, 2012 to January 31, 2013 were screened for inclusion using a customized electronic trigger tool. Patients who had an increase in serum creatinine of 0.3 mg/dL or greater from baseline were included in the sample population, while those found to have preexisting renal conditions were excluded from the analysis. Descriptive statistical and multivariate analysis was performed on the collected data.

Results and Conclusion – Pending and will be presented.

ACPE #:0126-9999-13-112-L01-P
Learning Objectives:
- List patient factors that have been associated with AKI in pediatrics.
- List medications that are most associated with AKI in a pediatric hospital.


103 - CARE TRANSITIONS SERVICE: A PHARMACY-DRIVEN MEDICATION RECONCILIATION PROGRAM THROUGH THE CONTINUUM OF CARE (2 OF 2)

D1. Medication Safety

Presented by:

Jessica Conklin, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Palm I

The current literature evaluates medication errors from two distinct perspectives: the inpatient/hospital setting and the post discharge/ambulatory care setting. Few studies have analyzed medication discrepancies across the continuum of care defined as the movement of a patient from admission through post-discharge. This study is a two-part series analyzing (1) an ongoing inpatient pharmacy-driven care transitions service and (2) the implementation of a pilot extension of this service in the outpatient setting and its impact on medication related problems (MRP) throughout the entire continuum of care. The second part of this series will be presented.

Methods
A single-center descriptive study is being conducted within the University of New Mexico Hospital (UNMH) clinics. The study has been submitted and approved by the Institutional Review Board. Data will be collected over 4 phases. Phases 1 through 3 are described in part one of this study and includes admission medication
reconciliation, hospital-to-community-pharmacist hand off, and follow up phone call after discharge. This study focuses on phase 4, which provides post-discharge medication reconciliation completing the continuum of care. Patients > 18 years of age who speak English or Spanish and are able to provide verbal consent will be included. Patients without an extensive medication history, discharged to a facility other than home or have a planned readmission will be excluded. Data collected include patient demographics, past medical history, type of MRP, medications correlating to MRP, pharmacy interventions and recommendations.

All patients who receive any phase of part one of the care transitions service (CTS) will be eligible for the final outpatient phase of the study. Patients will be identified at discharge using an electronic medical records scheduling system. During the patients’ post-discharge visit with their provider, a trained pharmacist will conduct an extensive medication reconciliation and perform a health literacy test on each patient using the Newest Vital Sign toolkit. Additional MRP, specific to the outpatient setting, may include medications that have been continued despite discontinuation orders at discharge, patient self-discontinuation of medications despite continuation orders at discharge and adherence divergences.

Primary outcomes include the type and prevalence of MRP present upon the follow up appointment to a UNMH clinic. Secondary outcomes include association between MRP and health literacy and comparisons of patients who received some versus all phases of the CTS pharmacy program. Data analysis will be conducted using Statistical Package for Social Sciences. Descriptive analyses, t-test for comparison of means and linear regression will be employed. Results will be presented.

ACPE #:0126-9999-13-113-L01-P

Learning Objectives:
- Explain why there is a need for medication reconciliation through the complete continuum of care.
- Describe potential pharmacy interventions and/or recommendations to be made during each transition of care in the outpatient setting.


104 - THE EFFECT OF AN ALLOPURINOL TITRATION GUIDELINE ON TIME TO SERUM URIC ACID TARGET

B1. Ambulatory Care

Presented by:

**Ryan Conrad, PharmD**
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*Presenting on Tuesday, May 14 at 2:30 PM in Executive 713*

Despite being a well-understood disease with safe and effective therapies, the management of gout remains far from optimal. Lack of standardization and specific allopurinol titration guidelines often leads to inappropriate use of acute gout agents for chronic gout management. Furthermore, patients initiated on allopurinol often receive inadequate doses preventing achievement of serum uric acid target (SUA<6mg/dL). For those patients that do achieve SUA target, the average time to goal is usually very extended.

The objective of this study is to evaluate a standardized allopurinol titration guideline and compare the percentage of patients that achieve SUA target within 12 weeks compared with patients not managed according to this guideline. A retrospective chart review was conducted on Kaiser Permanente Hayward and Fremont
patients managed according to the allopurinol titration guideline between November 2012 and February 2013. These patients were compared to similar patients managed between November 2011 and February 2012, prior to this guidelines being approved and implemented. Inclusion criteria included Age>18 years; active diagnosis of gout on colchicine daily or colchicine daily and allopurinol; and SUA>6mg/dL. Exclusion criteria included no diagnosis of gout; age<18 years; hospice/palliative care patients; patients with multiple myeloma, leukemia, or lymphoma; kidney transplant patients on cyclosporine therapy; patients with ESRD or CrCL<10mL/min; and patients on febuxostat or other urate-lowering therapy.

Preliminary data of the study has been promising, with approximately 50% of patients achieving SUA target within 12 weeks. Of those patients who achieved SUA target within 12 weeks, the average time to SUA target is 34 days. Final results and conclusions will be presented, including: (1) percentage of patients what achieved SUA target of <6mg/dL within 12 weeks; and (2) Average time to achieve SUA target of <6mg/dL

ACPE #:0126-9999-13-114-L01-P
Learning Objectives:
   Explain the role of allopurinol in the management of chronic gout
   Describe the impact of a standardized allopurinol titration guideline on the time to achieve serum uric acid target


105 - EFFICACY/SAFETY OF HYDROXYETHYL STARCH 130/0.4, ALBUMIN 5%, OR HETASTARCH 6% IN POST-CARDIOTHORACIC SURGERY PATIENTS
B3. Critical Care

Presented by:
Holly Cooper, PharmD
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Presenting on Tuesday, May 14 at 11:30 AM in Executive 715

Introduction:
The beneficial role of colloids for perioperative volume replacement is well-supported. At Exempla Saint Joseph Hospital, albumin has traditionally been reserved for postoperative cardiothoracic surgery patients at higher bleeding risk since hydroxyethyl starch (HES) alternatives such as hetastarch 6% (Hespan®) are associated with bleeding complications. 6% HES 130/0.4 (Voluven®) however is a third-generation HES that was designed with an improved pharmacokinetic profile to ultimately help overcome the increased risk of bleeding and renal dysfunction compared to hetastarch 6%. It has a lower molecular weight and molar substitution (130/0.4) that allows for more rapid metabolism and elimination and is therefore not associated with the same accumulation seen with the other HES products. Although more research is needed, studies suggest comparable efficacy of HES 130/0.4 to both albumin 5% and other HES formulations in cardiac surgery patients. In light of these advantages and cost savings, HES 130/0.4 was added to formulary on 10/11/12 with the intention to replace the use of albumin 5% in the perioperative setting in cardiothoracic surgery patients.

Goals:
To determine if 6% HES 130/0.4 is as effective as albumin 5% and hetastarch 6% at increasing the cardiac index > 0.5 L/min/m2 in post-cardiothoracic surgery patients. Additionally, this study will examine the safety profile of
this newer third generation HES as compared to hetastarch 6\% which has a different molecular structure (600/0.75).

Methodology:
Retrospective chart review of patients who underwent cardiothoracic surgery and received either 6\% HES 130/0.4, albumin 5\%, or hetastarch 6\% within 3 hours of arrival to the ICU for post-operative volume replacement (n = 25 per group). Patients that have received 6\% HES 130/0.4 will serve as the index group and will subsequently be matched by type of surgery, gender, and age to another patient who received either albumin 5\% or hetastarch 6\%. The primary objective is to determine if 6\% HES 130/0.4 is as effective as albumin 5\% and hetastarch 6\% at increasing the cardiac index > 0.5 L/min/m^{2}. The secondary objective will measure the total volume of colloids utilized within 24 hours post-surgery for each group. In addition, the incidence of acute kidney injury and bleeding complications will be collected.

Results/Conclusions: will be presented

ACPE #:0126-9999-13-115-L01-P

Learning Objectives:
Explain the pharmacokinetic differences associated with 6\% hydroxyethyl starch (HES) 130/0.4 and the implications on its adverse effect profile compared to other HES alternatives.
Describe the relative efficacy of HES 130/0.4, albumin 5\%, and hetastarch 6\% in postoperative cardiothoracic surgery patients requiring volume replacement.


106 - INCIDENCE OF DISCONTINUATION OF POTENTIALLY INAPPROPRIATE MEDICATIONS (PIMS) DURING HOSPITALIZATION FOR FALLS.
B5. Long-Term, Geriatric or Hospice Care

Presented by:
Sara Corazza, PharmD
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Presenting on Tuesday, May 14 at 9:00 AM in Sunset IV

Introduction
Thirty-four percent of frail elderly adults admitted to the hospital are admitted for falls, contributing significantly to the cost burden on health care systems. Fall risk in the elderly can be increased by a number of factors, including medications whose side effects may cause dizziness, drowsiness or weakness. The STOPP criteria for identification of potentially inappropriate medications (PIMs) have been validated and shown to be more sensitive at detecting PIMs in the acute care setting than other explicit criteria. Prevention of falls prior to admission would be ideal; however a hospital admission provides opportunity for review and optimization of drug therapy in the elderly. Following validation of the STOPP criteria, there has been no evaluation of incidence of discontinuation of PIMs in the acute care setting. Furthermore, outcomes associated with discontinuation of PIMs during a hospital stay have not been determined.

Objectives
The primary objective is to determine the incidence of discontinuation of PIMs (identified via STOPP criteria) in older adults admitted for falls. The secondary objective is to evaluate readmission in 30 days and determine whether continuation of PIMs is an indicator of readmission. Correlation between discontinuation of PIMs and a
decrease in 30-day readmission rates would suggest implementation of explicit medication review in elderly patients admitted for falls could improve patient outcomes and potentially decrease cost burden.

Methodology
This evaluation will entail a cross-sectional, retrospective chart review of elderly patients admitted to University of Arizona Medical Center with a diagnosis of fall (based on ICD-9 coding). A pharmacist will review the patient’s pre-hospitalization medication list and discharge medication list. PIMs on each list will be identified using the STOPP criteria and incidence of discontinuation rate of PIMs will be determined. Readmission in 30 days will be recorded and descriptive statistics will be used to characterize patients who are readmitted versus those who are not. Regression analysis will be used to adjust for variability between groups.

Results/Conclusion
To be presented.

ACPE #:0126-9999-13-116-L01-P

Learning Objectives:
1. Describe the incidence of discontinuation of PIMs in elderly patients acutely admitted to the hospital due to a fall
   Explain the strengths and weaknesses of implicit versus explicit medication review in the elderly patient.


107 - PHARMACISTS' PERCEPTIONS OF THEIR VALUE AND KNOWLEDGE OF DRIVERS IN HEALTHCARE AT AN ACADEMIC HEALTH SYSTEM
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Karen Craddick, PharmD
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Presenting on Wednesday, May 15 at 11:00 AM in Sunset III

Objective: To identify, qualify and understand pharmacists’ perceptions about their value and their knowledge of drivers of healthcare.

Introduction: University of Washington (UW) Medicine is a 1400 bed, academic health system comprised of five institutions. UW Medicine consists of two large academic medical centers, two community hospitals and one cancer treatment center with pharmacy practice models varying between sites. Given the recent growth of UW Medicine and pressures in health care to contain costs and provide an advanced level of service to patients, an analysis of the current UW Medicine pharmacy practice model is underway. The analysis is part of a larger project within the UW Medicine Department of Pharmacy that aims to enhance the current UW Medicine pharmacy practice model to meet the evolving needs of our patients, health system and outside entities. Using ASHP’s Pharmacy Practice Model Initiative (PPMI) Assessment Tool, gaps in the practice model will be identified and a vision created. Analyzing our current state, including pharmacist perceptions and knowledge, is a key step in creating an ideal strategy to address the gaps, set a vision for the future and mobilize change.

Methodology: An anonymous electronic survey was administered to all UW Medicine pharmacists, including inpatient, outpatient, ambulatory care and administration. Demographic data including number of years in practice, training, practice site and practice area was gathered. Survey questions assessed their perception of the value they provide to their patients, the institution and professional fulfillment in their role.

Knowledge of
drivers of healthcare change (i.e. Accountable Care Organizations, Value Based Purchasing, The Patient Protection and Affordable Care Act) was assessed and they were asked how they would like to be engaged in defining the role of pharmacists in the future of healthcare. Finally, respondents were asked to comment on what would improve their ability to positively impact patient care at their institution.

Results: Results will be presented.

ACPE #:0126-9999-13-117-L04-P
Learning Objectives:
1. Describe the Pharmacy Practice Model Initiative (PPMI)
2. Identify key values held by pharmacists practicing at an academic medical center


108 - PHARMACISTS IMPACT ON OPTIMIZING CARE AND DECREASING READMISSION RATES IN PATIENTS WITH CONGESTIVE HEART FAILURE

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Steve Crenshaw, PharmD
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Presenting on Tuesday, May 14 at 10:00 AM in Royal V

PHARMACISTS IMPACT ON OPTIMIZING CARE AND DECREASING READMISSION RATES IN PATIENTS WITH CONGESTIVE HEART FAILURE

Congestive Heart Failure (CHF) is a chronic disease associated with high patient morbidity and mortality, decreased quality of life, and costly medical expenses. According to the American Heart Association, there are 670,000 new cases of CHF each year and a total of 6.6 million patients had CHF in the United States in 2011. Nearly one in four patients with a diagnosis of CHF are re-hospitalized with a CHF exacerbation within 30 days of discharge accounting for $17.4 billion in health care costs. The purpose of this two-phase study was to identify the impact of pharmacy involvement in reducing 30-day readmission rates in patients with CHF treated at Eastern Idaho Regional Medical Center (EIRMC). Pharmacist intervention included inpatient medication reconciliation, medication compliance evaluation, and CHF education. Following patient discharge, the resident pharmacist would call each CHF patient (phase I) or interview them at the multidisciplinary CHF clinic (phase II) to evaluate medication reconciliation, medication compliance, and provide additional CHF education as needed. Patients were included in this trial if they met the criteria identified by 1 of 4 Diagnosis Related Groups (DRGs): 1. Heart failure and shock 2. Heart failure and shock with comorbidities 3. Heart failure and shock with multiple comorbidities 4. Heart failure and shock without comorbidities/multiple comorbidities. The primary endpoint of this study was to identify the impact of pharmacy involvement in reducing 30-day readmission rates in patients with CHF treated at EIRMC. Success of reducing 30-day readmission rates was measured in phase I using a modified Morisky scale questionnaire to analyze medication compliance. Phase II used a direct pill count of the patients’ medications in addition to the modified Morisky scale. Medication reconciliation of the patients’ hospital discharge list was also performed and medication errors were identified and recorded. The results of the primary endpoint will be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-118-L01-P
Learning Objectives:

- Describe the impact of congestive heart failure and its effect on 30-day readmission rates.
- List ways in which pharmacists can actively participate in helping reduce 30-day congestive heart failure readmission rates.


109 - INITIATION OF A PHARMACIST IN THE EMERGENCY DEPARTMENT: A SIX-WEEK PILOT PROGRAM AT A COMMUNITY, LEVEL-2 TRAUMA CENTER

B4. General Clinical Practice

Presented by:

Jeremy Crowfoot, PharmD
Saint Alphonsus Regional Medical Center
crowfooj@sarmc.org

Presenting on Tuesday, May 14 at 4:00 PM in Royal II

Introduction: Pharmacists have achieved a substantial presence throughout most hospitals; however, they are most notably absent from many emergency departments (ED). The ED can be a fast-paced environment with many verbal orders and little medical history is known about most patients; yet, there is a lack of double- and triple-checks that have become standard throughout the rest of the hospital. In a nationwide analysis, comparing nursing units, the ED has the highest rate of preventable adverse events. In 2006, the Institute of Medicine recommended the inclusion of a clinical pharmacist as part of the emergency care team. As of 2007, only 3.5% of U.S. hospitals had an ED pharmacist; however, this number is rapidly rising.

Objective: The objective of this trial is to evaluate the utility of clinical pharmacist services in the ED at Saint Alphonsus Regional Medical Center in Boise, Idaho. Saint Alphonsus is a 385-bed, level-2 adult and pediatric trauma center, with 44,000 ED patient visits annually. Over the past four years, the pharmacy has provided medication reconciliation technicians for the ED, but no pharmacist presence.

Methods: The project began by meeting with the ED operations team and asking what services they would like from pharmacy, as well as what hours the ED pharmacist should cover. Four pharmacists – three are experienced with critical care; one is currently a resident – were selected to rotate through the ED over a six-week period. The ED pharmacist was present in the ED from 1400 until 2200, seven days per week. A swing-shift position in the main pharmacy was suspended; thereby providing the financial support for the ED pharmacist.

The impact of the ED pharmacist was monitored subjectively and objectively. Subjectively: 1) the nurses and providers were asked to complete an online survey regarding the value they place on the ED pharmacist; and 2) pharmacists had their own survey regarding the perceived hardship placed upon the main pharmacy since there was one less pharmacist to help with orders in the main pharmacy. Objectively: 1) all clinical activities of the pharmacists were recorded; 2) for STEMI patients, time to catheterization lab; 3) for sepsis patients, time to first antibiotic, time to ICU, and length of hospital stay; 4) for stroke patients, time to alteplase; and 5) for the main pharmacy, the percent of STAT orders verified within 15 minutes.

Results and Conclusions: Results and conclusions will be presented May 2013.

ACPE #:0126-9999-13-119-L01-P

Learning Objectives:
Describe the degree of value nurses and providers place on the clinical pharmacists in the ED at Saint Alphonsus Regional Medical Center. Identify the three most common interventions performed by clinical pharmacists in the ED at Saint Alphonsus Regional Medical Center.


110 - EVALUATION OF OFF-LABEL DRUG USE AND ADVERSE DRUG EVENTS IN THE INTENSIVE CARE UNIT

B3. Critical Care

Presented by:
Mark Culver, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Executive 715

Introduction: The use of medications for an off-label indication has been shown to occur in 36% of medications prescribed in the intensive care unit (ICU). When a medication is being used off-label, it is not subject to the same scientific scrutiny as when used for a Food and Drug Administration (FDA) approved indication, which increases concern for safety and the development of adverse drug reactions (ADRs). Although it is known that medications are used commonly for off-label indications in the medical intensive care unit (ICU), the frequency of ADRs due to off-label use has not been established. When a critically ill patient develops an ADR, the length of stay is increased up to 4.8 days, which translates into an additional $15,000 in healthcare expenditures. The identification of risk factors for the development of ADRs is of paramount importance in the prevention of these events.

Methods: This investigation was a multi-centered, comparative, prospective evaluation of patients admitted to the medical ICU at three academic medical centers over a three-month time period. Following institutional review board approval, the clinical pharmacist evaluated all inpatient medications to determine if they are being utilized for their FDA-approved or an off-label indication upon ICU admission. The pharmacist also evaluated any newly prescribed medications for the entire duration of ICU stay. Patients were assessed daily in the ICU for the development of an ADR. The potential ADR was objectively evaluated using three objective and published assessment determination instruments (Kramer, Naranjo, and Jones). An ADR was documented when 2 of the 3 instruments had an agreement of “possible” or greater. The severity of the ADR will be classified based upon the National Cancer Institute’s Common Terminology Criteria for Adverse Events and a modified version of the MEDMARX® form.

Results and Conclusions: Preliminary results from Banner Good Samaritan Medical Center will be presented.

ACPE #:0126-9999-13-120-L01-P

Learning Objectives:
- Describe the prevalence of off-label drug use in intensive care units.
- List risk factors associated with adverse drug reactions in critically ill patients.

112 - PRELIMINARY SINGLE CENTER EXPERIENCE WITH ALEMTUZUMAB (CAMPATH®) FOR PEDIATRIC CARDIAC RE-TRANSPLANTATION INDUCTION AND RESISTANT REJECTION

B6. Pediatric or Gender Specific Care

Presented by:

Patricia Cutting, PharmD
Children's Hospital Colorado
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Presenting on Tuesday, May 14 at 11:30 AM in Sunset II

Introduction
Alemtuzumab (Campath 1H) is an anti-CD52 humanized monoclonal antibody that binds to all T and B lymphocytes, most macrophages, monocytes, and natural killer cells. First used in solid organ transplant for renal transplant patients, recent studies have shown that alemtuzumab has similar rates of delayed graft function and infection when compared with other antibody therapies for renal and heart transplantation. Current literature is limited on use of alemtuzumab in pediatric heart transplant as induction therapy or for resistant rejection. A lack of consensus also exists among institutions for the most appropriate therapies for these indications. This institution began using alemtuzumab for induction in re-transplanted patients with documented coronary vasculopathy, as well as rejection refractory to steroids and antithymocyte globulins. The purpose of this retrospective study was to evaluate the safety and outcomes in heart transplant patients who have received alemtuzumab in a single institution.

Methodology
A retrospective review was conducted on all patients transplanted and followed by The Heart Institute at Children’s Hospital Colorado who received alemtuzumab between 1/9/2005 to 9/30/2012 for induction therapy or resistant rejection. The electronic medical record and a cardiac transplant electronic tracking system were used to review the medication record, progress notes, clinic encounters, and microbiology and laboratory results. Short and long term outcome measures included infusion related reactions, mortality, number of rejection episodes, infections, secondary malignancy, and long-term cell line side effects post alemtuzumab.

Results and Conclusion
Results will be analyzed using appropriate statistical methods. The findings of this study will be presented after completion.

ACPE #:0126-9999-13-122-L01-P
Learning Objectives:

- Describe the mechanism of action of alemtuzumab.
- Discuss the alternative therapies for re-transplant induction and resistant rejection.


113 - EVALUATING THE RELATIONSHIP BETWEEN HEALTH LITERACY, TRANSPLANT KNOWLEDGE, AND KIDNEY FUNCTION

B1. Ambulatory Care
Introduction: Health literacy is defined as the extent to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions according to the National Library of Medicine. Low health literacy is a significant barrier to acquiring health services, understanding health information, and making well-informed decisions with regards to medical treatment options, and as a result has the potential to have a considerable impact on health outcomes. Limited health literacy is associated with increased health care costs, lower self-reported physical health, higher morbidity and mortality, and increased hospital readmissions.

In the area of transplantation, less is known about health literacy. Little data is available on who is at risk and there is little to no understanding of contributing factors or what effects limited health literacy has on a patient’s allograft function and their utilization of health care resources. A study by Gordon et al. in 2009 used the Short Test of Functional Health Literacy (S-TOFHLA) and Rapid Estimate of Adult Literacy in Medicine-Transplantation (REALM-T) tests which showed limited health literacy and transplant knowledge in kidney transplant patients was associated with higher serum creatinine values. The S-TOFHLA test is widely accepted as an effective tool to measure health literacy and demonstrate good correlation with one another in their independent assessment of health literacy levels. Our research aims to validate the Gordon study and also target a more ethnically diverse population, including non-English speaking patients to help better characterize the relationships of health literacy, transplant knowledge, and kidney allograft function, and hospital readmissions after transplant.

Methodology: This research project was approved by the UCSD Investigational Review Board (IRB). In this prospective investigation, recruitment of patients with kidney transplants will occur during their regularly scheduled follow-up clinic visits. Inclusion criteria: English or Spanish-speaking post renal transplant patients ≥ 18 years of age. Exclusion criteria: patients < 18 years old, learning disability, history of previous transplant, combined kidney-liver transplant, on dialysis after transplant, pregnancy, and patient enrolled in another study that may interfere with this study. Consented patients will be tested using the S-TOFHLA and REALM-T after kidney transplantation. Once the patients have completed the health literacy tests, their data will be collected and entered into a database for review. In addition to the S-TOFHLA and REALM-T test information, other data collected will include sociodemographic information (gender, age, race/ethnicity, income, education, insurance information, and marital status) and clinical information (date of transplant, labs indicating graft function, source of organ donor, and cause of end stage renal disease) using the UCSD PCIS and EPIC computer systems. Results and conclusions will be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-123-L01-P
Learning Objectives:

Describe the relationship between health literacy, transplant knowledge, and graft function after kidney transplantation.

Describe the rate of hospital readmission within 3 months post-transplantation as it relates to health literacy and transplant knowledge.

Introduction: Pharmacogenomics has been heralded as the next giant step in delivering the most appropriate pharmacotherapy option for patients. Through personalized medicine, specific drugs can be selected to provide the most effective medication for the patient given his or her own personal genome. However, the practicality of implementing a genotype screening protocol within the Kaiser Permanente system has yet to be assessed. Given the growing support for genotyping specific drug metabolizing enzymes (CYP enzymes), the interest in implementing pharmacogenomic services is growing. However, numerous barriers exist including testing costs, knowledge deficits amongst clinicians, as well as ethical and regulatory concerns. Furthermore, although several studies have been able to show clinical benefits of CYP2C19 genotyping for specific populations, little evidence for clinical translation exists. Within Kaiser Permanente Colorado’s 530,000 patient network are 100 clinical pharmacy specialists, providing an optimal setting to implement a clinical pharmacy pharmacogenomics consult service. The primary objective for this project is to assess feasibility of implementing a clinical pharmacy service to provide CYP2C19 genotype-guided antiplatelet therapy recommendations for two ambulatory cardiology clinics in the Denver-Boulder area. Patients at moderate cardiovascular risk who have been recommended for elective cardiac catheterization for definitive diagnosis of obstructive coronary artery disease will be recruited into the study. Prior to the scheduled procedure, patients who consent will be tested for their specific CYP2C19 genotype. Alternative agents (e.g., prasugrel or ticagrelor) will be recommended to the interventional cardiologists for patients found to be CYP2C19 poor metabolizers (e.g., CYP2C19*2/*2). The following outcome measures will be assessed: prescriber acceptance (percent of recommendations accepted by cardiologist), patient acceptance (percent of patients consenting to genotyping), and availability of genotype results prior to elective cardiac catheterization (percent of test results available before elective cardiac catheterization).

Methodology: With the assistance of cardiologists within Kaiser Permanente Colorado (KPCO), ten patients undergoing catheterization will have CYP2C19 genotyping performed prior to the actual procedure. Patients will be categorized as either poor, intermediate, or extensive metabolizers based on the presence of specific allele sequences. Pharmacogenomic results will then be uploaded into the patient’s electronic medical record along with the investigators recommendation based on the presence or absence of the loss-of-function allele. Given the recommendation made by the clinical pharmacist, the cardiologist will then be polled on his preferred medication for the patient, both before and after access to pharmacogenomic results.

Results: pending
Conclusion: pending

ACPE #:0126-9999-13-124-L01-P
Learning Objectives:
- Explain the process in implementing a pharmacogenomics service within an ambulatory clinic setting.
- Describe some potential problems that should be identified prior to implementing a pharmacogenomics service.

115 - RISK OF THROMBOEMBOLISM DURING WARFARIN INTERRUPTION WITHOUT BRIDGE THERAPY (RIOT) STUDY

B1. Ambulatory Care

Presented by:

Loren Davies, PharmD
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Presenting on Tuesday, May 14 at 3:30 PM in Executive 713

Introduction: The management of patients receiving warfarin who require surgical or invasive procedures presents a dilemma for practicing clinicians. The procedure-related bleeding risk and the thromboembolic (TE) risk associated with the underlying indication for warfarin therapy must be weighed to determine if warfarin should be continued or held, and if bridging anticoagulation therapy should be used. Currently, there are no randomized, controlled clinical trials to inform preferred practices, and data regarding the risk for TE in the perioperative period for patients interrupting warfarin therapy without bridging are lacking.

Objective: The primary objective of this study was to determine the 90-day rate of thromboembolism in patients who interrupted warfarin therapy for an invasive procedure without receiving bridging anticoagulation. Secondary objectives were to determine 90-day clinically-relevant bleeding and all-cause mortality rates, assess whether the proportions of patients with a thromboembolic or bleeding event varied across risk categories, and to identify factors independently associated with thromboembolism and bleeding.

Methods: This was a retrospective, data-only, cohort study. Warfarin patients greater than 18 years who underwent an invasive diagnostic or surgical procedure between 1/1/2005 and 3/31/2012 requiring a pre-procedure target INR of ≤1.5, without receiving bridging anticoagulation, and who were monitored by the Kaiser Permanente Colorado Clinical Pharmacy Anticoagulation and Anemia Service at time of procedure were included. Patients were excluded if they had a second warfarin interruption for an invasive procedure within 90 days or if they did not resume warfarin in the 30 days following the procedure. Indication for warfarin therapy, target INR range, thrombophilia risk factors, date and type of procedure, INR laboratory measures, use of bridging therapy, patient comorbidities, and bleeding or thromboembolic events were obtained administratively. Manual chart reviews were performed to obtain data that was not easily identifiable administratively and to confirm the presence of a thromboembolic or bleeding event. Ninety day event rates were calculated and compared against risk groups (for thromboembolism: high, moderate, or low as defined by Antithrombotic Therapy and Prevention of Thrombosis, 9th edition: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines risk stratification; for bleeding: high or low based on procedure type).

Results/Conclusion: Preliminary results will be presented.

ACPE #:0126-9999-13-125-L01-P

Learning Objectives:

- Explain risk factors for thromboembolism and bleeding events in the peri-procedural period.
- Describe the real-world rate of thromboembolic events in the first 90 days following a procedure in which warfarin was held in patients who did not receive bridging anticoagulation.

Introduction
Roughly one-half of patients undergoing total knee arthroplasty (TKA) experience inadequate postoperative pain relief. Pain management strategies after TKA include the use of patient-controlled analgesia (PCA), epidural analgesics and continuous opioid infusion. More recent approaches to surgical pain management have included the use of intraoperative intraarticular injections and intraoperative periarticular injections, both providing local analgesia with fewer associated systemic effects than previously mentioned pain management strategies. The objective of this study is to compare the effectiveness of intraoperative intraarticular and intraoperative periarticular injections in patients undergoing knee surgery.

Objective
To evaluate the effectiveness of sustained analgesia produced when using intraoperative periarticular versus intraoperative intraarticular injections in surgical patients.

Methodology
The medical center’s electronic record system was used to identify patients who, over a twenty-one month period of time, had undergone a total knee arthroplasty performed by one of two surgeons, and received either an intraoperative intraarticular injection or an intraoperative periarticular injection. Intraoperative intraarticular injections were used during the time period immediately preceding the use of intraoperative periarticular injections. Intraoperative periarticular injections contained 30 milliliters of either 0.25% or 0.5% bupivacaine solution. Intraoperative periarticular injections contained ropivacaine 246.25 mg (49.25 mL), epinephrine 0.5 mg (0.5 mL), ketorolac 30 mg (1 mL), and clonidine 0.08 mg (0.8 mL) combined with normal saline for a total volume of 100 milliliters. The following data was collected: patient age, gender, date of surgery, type of knee surgery, length of surgery, hospital length of stay, presence of postoperative adverse effects and daily postoperative analgesic use. The incidence of postoperative analgesia associated adverse effects such as nausea or vomiting, pruritis and sedation were obtained from the nurses’ notes and medication administration sections of patient charts. Statistical evaluation using Fisher’s exact test and 2-tailed, Student’s t-test was performed to compare the demographics and overall outcomes.

Results
123 and 153 patients underwent surgery with surgeon one and two respectively. No differences in outcomes were seen between injections for surgeon one. Length of stay for surgeon two was decreased with the periarticular injection but did not reach statistical significance (p=0.050). Also for surgeon two, opioid use was increased during time periods 24-48 hours (p=0.017) and 48-72 hours (p=0.010). When combined for both surgeons, patient demographics between the two types of injections did not differ for gender (p=0.107) or age (p=0.778). Length of stay with the periarticular injection was decreased from 75.9 hours to 67.0 hours (p=0.027). The occurrence of nausea or vomiting was also decreased with the periarticular injection (p=0.014). However, opioid use in the 24-48 hours period increased (p=0.020). No other differences were seen.

Conclusion
Intraoperative periarticular injections may decrease hospital length of stay and post-operative nausea or vomiting while increasing the post-operative day two opioid use.

ACPE #:0126-9999-13-126-L01-P
Learning Objectives:
  Explain the differences between periarticular and intraarticular injections
  Describe trends in post-operative opioid use and hospital length of stay as it relates to patients who receive periarticular or intraarticular injections for total knee arthroplasty


**117 - ASSOCIATION BETWEEN PROTON PUMP INHIBITORS AND CHANGES IN HEMATOLOGICAL INDICES IN A VETERAN POPULATION**

A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

**Shannon Davis, PharmD**
Phoenix VA Health Care System
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*Presenting on Tuesday, May 14 at 8:30 AM in Mission Bay Foyer*

The objective of this study is to determine if proton pump inhibitors (including dexlansoprazole, esomeprazole, lansoprazole, omeprazole, pantoprazole, and rabeprazole) leads to changes in hematological indices (hemoglobin, hematocrit, mean corpuscular volume, mean corpuscular hemoglobin, red blood cell count, and red cell distribution width) consistent with an iron deficient state. In this retrospective chart based review, subjects aged 18-65 yrs old with gastroesophageal reflux disease (GERD) who were initiated on a proton pump inhibitor (PPI) at the Phoenix VA Health Care System between 1/1/06-12/31/10 and continued for at least 6 months of therapy will be included. Data extraction from the medical record will be performed with a database query utilizing DSS data pulls, FileManager (FileMan), the VHA Region 1 data warehouse, and Prescription (RX) fills. The primary objective of this study is to determine if PPI use leads to changes in hematological indices consistent with an iron deficient state. A secondary objective of this study includes evaluation of iron studies (if available) in study subjects before and after (6 months to 2 years) initiation of PPI. The primary objective will be analyzed via inferential statistics and a paired t-test will be used to analyze pre- and post-PPI hematological indices. Results and conclusions will be presented.

Disclaimer: This study is supported by the Department of Veterans Affairs and is the result of work supported with resources and the use of facilities at the Phoenix VA Health Care System. The investigators are employed through the Phoenix VA Health Care System in Phoenix, AZ. The contents of this study do not represent the views of the Department of Veterans Affairs or the United States Government.

ACPE #:0126-9999-13-127-L01-P
Learning Objectives:
  Describe trends in hematological indices in subjects initiated on proton pump inhibitor therapy.
  List ways pharmacists can more effectively monitor proton pump inhibitor therapy.

118 - OPIOID USE IN VETERANS WITH POST TRAUMATIC STRESS DISORDER OR TRAUMATIC BRAIN INJURY
A5. Neuro-Psych or Pain Management Agents

Presented by:

Maira Davis, PharmD
Southern Arizona VA Healthcare System
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Presenting on Tuesday, May 14 at 11:30 AM in Palm III

BACKGROUND: Major advances in body armor technology and battlefield medicine have improved survival from combat injuries that would have been fatal in past wars. Traumatic brain injury (TBI) is one of the hallmark injuries from Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF). Because TBI is associated with a traumatic event, it has been found to have a high comorbidity with post traumatic stress disorder (PTSD). Higher levels of pain have been reported in trauma patients with PTSD due to high levels of anxiety, catastrophic thinking, limited cognitive capacity to cope with pain management, and a focus on negative events. The high incidence of both chronic pain and PTSD after suffering a TBI, complicated by the complexity of these three overlapping comorbidities, makes pain management difficult for this population. Opioid use has been associated with increased risk of adverse clinical outcomes in patients with PTSD and/or TBI. Although, the increased risk associated with opioids in this population has been determined, the extent of the use of opioids in this veteran population is poorly defined. Due to the complex interactions and safety concerns of using opioids in this population, the purpose of this study is to evaluate the management of pain medications in OEF/OIF veterans diagnosed with PTSD and/or TBI.

METHODS: This research is the result of work supported with resources and the use of the facilities of Southern Arizona VA Health Care System (SAVAHCS), Tucson, AZ. This study has been approved by the SAVAHCS Institutional Review Board and by the SAVAHCS Research and Development. This study is a retrospective chart review using electronic medical records at SAVAHCS to evaluate the management of opioid pain medications in an at-risk veteran population. One hundred OEF/OIF patients with TBI and/or PTSD, and 100 OEF/OIF patients without TBI or PTSD will be randomly selected to be included in the study. Exclusion criteria will include patients reestablishing care after being dropped from rolls due to lack of visits, patients who do not establish consistent care within SAVAHCS, pain due to cancer, and mental health diagnoses other than anxiety, depression, sleep disorder, or PTSD. We will determine the average level of opioids prescribed on admission to SAVAHCS and one year later. For a subgroup analysis, both groups will be examined for patients that were seen by a Pain, Polytrauma, or TBI subspecialty clinic and those who were only seen by the primary care provider. Descriptive statistics, Chi square analysis, and t-tests will be utilized as appropriate.

RESULTS: Will be presented

ACPE #:0126-9999-13-128-L01-P
Learning Objectives:
- Describe the management of opioids in a high-risk veteran population
- Describe outcomes from the use of subspecialty clinics on opioid management in a high-risk veteran population

119 - RETROSPECTIVE ANALYSIS OF EFFICACY AND SAFETY WITH THE USE OF DABIGATRAN AND RIVAROXABAN
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Monika Tara De Leon, PharmD
Madigan Army Medical Center
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Presenting on Tuesday, May 14 at 11:00 AM in Royal V

Introduction: Dabigatran, a direct thrombin inhibitor, and rivaroxaban, a factor Xa inhibitor, are two alternatives to warfarin therapy for prevention of stroke in patients with nonvalvular atrial fibrillation. Rivaroxaban was added to the Madigan formulary in November 2011. Dabigatran was added in February 2011. Because these agents were just added to the formulary recently, it is important to see if these agents are effectively being used in this population. This study will be an evaluation of their use, efficacy, adherence, appropriateness, and side effect profile.

Methods: A retrospective chart review will be conducted from January 2011 to June 2011 for dabigatran and from October 2011 to July 2012 for rivaroxaban. Efficacy endpoints will be measured by those who experienced a stroke. Adherence will be measured by looking in CHCS and AHLTA to review consistent refill history. Appropriateness of therapy will be determined by a diagnosis of atrial fibrillation in AHLTA. Side effects, such as bleeding, will be monitored using data from central spreadsheet monitoring all ADRs in the hospital, as well as patient databases (AHLTA, CHCS, Essentris). Other patient characteristics that will be analyzed separately are drug discontinuation rate, renal function within 30-90 days prior to prescribing dabigatran and rivaroxaban, and CHADS2 (and CHA2DS2VASc if the CHADS2 score is 0 or 1) score.

Results and Conclusion: To be discussed and presented.

ACPE #:0126-9999-13-129-L01-P
Learning Objectives:
- Describe the use of rivaroxaban and dabigatran at Madigan Army Medical Center
- Describe the outcomes of this retrospective study.


120 - DIABETES RISK STRATIFICATION USING A MODIFIED DCSI SCORING SYSTEM IN A MANAGED MEDICAID POPULATION
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Mary Beth Derbyshire, PharmD
Health Plan of San Joaquin Managed Care Residency
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Presenting on Wednesday, May 15 at 10:30 AM in Sunset III
Introduction: In 2010, diabetes mellitus accounted for over $116 billion in direct medical costs in the United States. To help manage diabetes-related costs, health plans have enrolled patients in disease management programs. However, due to the limited availability of resources, all patients with diabetes cannot be enrolled in these programs. Since a small proportion of patients consume the majority of healthcare resources, identifying those patients through a stratification system to focus limited resources is valuable. The Diabetes Complications Severity Index (DCSI) was developed and validated as a useful method to use diagnosed complications and laboratory data to assess the risk of hospitalizations and mortality for patients with diabetes in an integrated health system. Furthermore, DCSI has been correlated to healthcare costs in commercial non-integrated populations. Hospitalizations and HbA1c have been suggested to be predictive of risk. Therefore, modifying the validated DCSI with additional factors predictive of healthcare costs may result in a more predictive risk stratification tool for patients with diabetes.

Objective: To assess the value of a modified DCSI in predicting costs and stratifying risk in a managed Medicaid population.

Methods: A retrospective claims database analysis was performed using three years of medical claims, pharmacy claims, and laboratory data from a 140,000+ member managed Medicaid health plan. Claims data was collected from July 2009 to June 2012. Multiple linear regressions were performed to correlate total healthcare expenditures with: 1) DCSI, 2) the modified DCSI with HbA1c severity level adjustment (modified DCSI-A), and 3) the number of hospitalizations per year. The HbA1c severity level adjustment was taken into account by adding an additional point to the DCSI if HbA1c was 8-9.9% and 2 points if ≥10%. A subgroup analysis of all members continuously eligible for the entire 3 year period was also performed.

Results: DCSI, modified DCSI-A, and number of hospitalizations were all significantly correlated to total healthcare expenditures. During fiscal years 2010, 2011, and 2012, the addition of each modifier to DCSI incrementally increased the correlation to total healthcare costs. The addition of the number of hospitalizations to DCSI better correlated to total healthcare costs than DCSI alone. The modified DCSI-A had the largest correlation over each of the three fiscal years than DCSI alone or DCSI combined with the number of hospitalizations. The combined subgroup analysis of all 3 years with the modified DCSI-A and number of hospitalizations was better correlated than DCSI combined with hospitalizations or DCSI alone (adjusted R2 = 0.613, 0.384, vs. 0.085, respectively), indicating that the addition of the HbA1c severity level adjustment and number of hospitalizations to DCSI correlated 53% higher to total costs than without this adjustment.

Conclusion: The modified DCSI with HbA1c severity level adjustment and hospitalizations may be more useful for stratifying risk and predicting costs compared to the traditional DCSI in the Medicaid population.

ACPE #: 0126-9999-13-130-L01-P
Learning Objectives:
- Describe the various modifications that influence risk in a Medicaid diabetes population.
- Describe the correlation between total costs and a modified DCSI scoring system.

Presenting on Tuesday, May 14 at 9:00 AM in Sunset V

Introduction: Medication Therapy Management (MTM) services are patient-centered encounters that result in the optimization of medication therapy, and improved clinical, economic and humanistic outcomes. Since the Medicare Prescription Drug, Improvement, and Modernization Act (MMA), these services were integrated into the benefit structure of Medicare Part D prescription drug plans and have shown increasing importance over the last decade. Pharmacist-provided MTM interventions have been shown to identify preventable adverse events and reduce the usage and costs of avoidable health care services. Since MTM is a crucial component of pharmacy practice, it is essential that pharmacy students be trained with the necessary skills to deliver these services.

According to Law et al, pharmacists agree they are positioned to provide MTM services. However, when the same pharmacists were questioned about willingness and preparedness to deliver MTM services, only 78.4% of pharmacists reported a willingness to provide MTM services and only 77.1% rated their pharmacy prepared to do so. There is a gap between pharmacists’ perceived credentials to deliver MTM programs and their readiness to do so.

Our institution’s curriculum includes a vertical thread for MTM curricular integration that is mapped to accreditation outcomes. As MTM opportunities expand within the profession, future pharmacists must possess the knowledge, skills, and abilities to provide these services.

Methodology: This study will evaluate the student pharmacists’ perception of readiness using a self-efficacy model to perform MTM services. The population is all pharmacy students enrolled in our institution as well as PGY1 and PGY2 residents.

An online survey was developed using Likert scaled based questions to assess student pharmacists’ readiness to practice. Survey questions include year in program, basic knowledge of MTM, existing MTM experience, and students’ perceived value of pharmacist-provided MTM services. Survey invitations were distributed via email with a link to an anonymous secure survey system. Students were offered extra credit in selected courses to encourage completion of the survey. Reminder emails will be sent weekly. Data will be analyzed using descriptive and inferential statistics.

Results and conclusions to be presented

ACPE #:0126-9999-13-131-L01-P

Learning Objectives:
- Explain students’ self-perceived readiness to perform MTM services throughout a four year Pharm.D. curriculum
- Describe the influence of MTM knowledge, attitudes and practices related to students’ perceived value of MTM services.


122 - EVALUATING THE ROLE OF VORICONAZOLE THERAPEUTIC DRUG MONITORING FOR TREATMENT OF INVASIVE ASPERGILLOSIS IN AML PATIENTS

A1. Infectious Disease - Anti-infecctive Agents

Presented by:

Andrea Dickens, PharmD
University of Washington Medicine
dickens1@uw.edu
Presenting on Tuesday, May 14 at 9:00 AM in Garden

Introduction: Invasive aspergillosis (IA) is associated with significant morbidity and mortality among immunocompromised patients. Acute myeloid leukemia (AML) patients are at particularly high risk for IA due to the myelosuppressive nature of induction and consolidation therapies, with an expected duration of neutropenia exceeding 7 days. The treatment of choice for IA is voriconazole, a broad-spectrum triazole antifungal agent. Voriconazole therapeutic drug monitoring (TDM) is utilized to minimize toxicity and maximize efficacy. However, historical data is conflicting regarding the correlation of voriconazole TDM and efficacy as well as toxicity. The objective of this study is to determine if there is a correlation between therapeutic drug monitoring of voriconazole and treatment outcomes in AML patients with IA.

Methods: The institution’s electronic medical record system was utilized to retrospectively identify AML patients over a two-year period with proven, probable, and possible IA as defined per the European Organization for Research and Treatment of Cancer and Mycoses Study Group of the National Institute of Allergy and Infectious Diseases. Patients younger than 18 years old, patients without AML, hematopoietic stem cell transplant recipients, and patients treated empirically were excluded from this study. Rate of complete response (CR) and partial response/stable disease (PR/SD) at 12 +/- 4 weeks of voriconazole therapy were evaluated in two groups: patients with TDM and patients without TDM. CR is defined as resolution of signs/symptoms and complete radiologic resolution of IA. PR/SD is defined as improvement or no change in signs/symptoms and radiologic findings. Treatment failure is defined as voriconazole discontinuation due to IA progression or death due to IA. Therapeutic voriconazole levels are defined as 2-5.5 mg/L per institutional standard. Statistical analysis will be completed and data will be analyzed by a team of clinicians to determine statistical and clinical significance of voriconazole therapeutic drug monitoring.

Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-132-L01-P
Learning Objectives:

- Explain the rationale, pros, and cons of voriconazole therapeutic drug monitoring.
- Describe criteria for proven, probable, and possible invasive aspergillosis as well as clinical implications.


123 - DEVELOPMENT AND IMPLEMENTATION OF A PHARMACIST CLINICAL COMPETENCY EDUCATIONAL PROGRAM AND THE IMPACT ON PROFICIENCY AND PHARMACIST SATISFACTION
B4. General Clinical Practice

Presented by:

Stacy Diggs, PharmD
Saint Alphonsus Regional Medical Center
diggsst@sarmc.org

Presenting on Tuesday, May 14 at 4:30 PM in Royal II

Introduction: At Saint Alphonsus Regional Medical Center, there are a number of pharmacy-driven policies and procedures designed to assist pharmacists in the management of patients on certain medications. Included in
each policy is a proficiency statement requiring all pharmacists to complete an educational program provided by pharmacy administration. However, at this time, there is no such program in place. Design and implementation of an educational program will begin with the following policies: Argatroban for Heparin Induced Thrombocytopenia & Thrombosis Syndrome (HITTS) and Inpatient Pharmacy Anticoagulation Management Services. The process design and pharmacist feedback will be utilized to provide the basis for the future development and implementation of an educational program for each of the pharmacy-related policies. Methodology: Design of an educational program will consist of an educational and an assessment component, while implementation will utilize the Saint Alphonsus eLearning program. Completion of the program will be required for all pharmacists at implementation, as well as, newly hired pharmacists and residents once the program is in place. The educational component will provide a review of key concepts for each policy, while the assessment component will ensure understanding and comprehension of policy content. The primary objective of this project is to determine if development and implementation of an educational program will improve pharmacist proficiency and satisfaction. Improvement in pharmacist proficiency will be measured by a comparison of the pre- and post-assessment test scores. An anonymous post-test questionnaire will be utilized to evaluate pharmacist satisfaction. Results and conclusion will be presented in May 2013.

ACPE #:0126-9999-13-133-L04-P
Learning Objectives:
- Describe the process of developing and implementing a pharmacist eLearning module
- Determine the impact of an eLearning module on pharmacist proficiency and satisfaction


124 - HEMOGLOBIN A1c CONTROL WITH PRANDIAL PLUS BASAL INSULIN REGIMENS VERSUS BASAL INSULIN ALONE
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:
Mark Dimapawi, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Mission Bay Foyer

The most effective treatment for diabetes is insulin, which can provide tight glycemic control and prevent long term complications. If used appropriately and dosed properly, no other therapy can match the glucose control achieved. Insulin regimens can be difficult and labor intensive, so oral agents are initially preferred. Unfortunately, most type 2 diabetic patients will eventually need insulin due to exhaustion of pancreatic beta cells causing a deficit in endogenous insulin production.

Many different types of insulin exist, offering different ways patients can be managed. The American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD) recommend the addition of a prandial insulin to a basal regimen if the hemoglobin A1c target is not achieved in 3-6 months. Adherence to this recommendation can vary.

The objective of this study was to compare the hemoglobin A1c control of patients on a prandial and basal insulin regimen versus those on a basal insulin regimen alone. Data was obtained via a retrospective chart review of type 2 diabetics from January 1, 2010 to December 31, 2011. Patients age 18-65 years old were
included if they had a hemoglobin A1c above 8% and were on basal insulin for at least 1 year. Those in the prandial and basal group must have filled a prandial insulin for the first time, and used it for at least 6 months. Exclusion criteria included pregnancy, any cardiovascular event in the last 6 months, history of bariatric surgery, use of non-insulin injectables, and use of premixed insulin. Baseline characteristics such as baseline hemoglobin A1c, insulin type, and oral diabetes medications were obtained. Evaluation of control was determined by the difference in hemoglobin A1c levels 6 months after inclusion in the study. Secondary outcomes included percentage of patients that reach the target A1c, correlation between A1c and the regimen used, and time between basal and prandial insulin starts. Hospitalizations due to hypoglycemia were also examined. Statistical analysis was completed using the t-test.

Results and conclusions will be discussed.

ACPE #:0126-9999-13-134-L01-P
Learning Objectives:
Describe the efficacy of a prandial and basal insulin regimen versus a basal only insulin regimen.
Explain when a prandial insulin should be considered.


125 - INTRAVENOUS IMMUNE GLOBULIN (IVIG) AND RITUXIMAB IN HLA SENSITIZED LUNG TRANSPLANT CANDIDATES
B3. Critical Care

Presented by:
Mariel Dimzon, PharmD
USC School of Pharmacy - Acute Care
dimzon@usc.edu

Presenting on Tuesday, May 14 at 8:00 AM in Executive 713

Purpose
Transplant rates are dramatically reduced in sensitized patients with high levels of anti-HLA antibodies, or Panel Reactive Antibodies (PRA), due to increased rejection rates and poorer graft survival. The PRA is a percentage of reactivity to a panel of common HLA antigens used to estimate the degree of humoral sensitization in the recipient before transplantation. Elevated pre-transplant PRA in patients requiring lung transplantation may identify high risk patients, yet there are few therapeutic approaches available to lower PRA or anti-HLA antibodies. Based on strategies utilized in other solid organ transplant patient populations to decrease PRA and improve the chances for transplantation, a similar treatment regimen of Intravenous Immune Globulin (IVIG) and Rituximab combination therapy was utilized in lung transplant candidates. This study analyzes whether the use of combination IVIG and Rituximab therapy in sensitized lung transplant patients decreases PRA levels and leads to successful lung transplants.

Summary
A retrospective chart review was conducted in highly sensitized lung transplant candidates with elevated baseline PRA who received monthly cycles of IVIG and Rituximab between January 2007 and February 2013. No patient who met the inclusion criteria was excluded. Baseline PRA levels were compared to PRA levels obtained following each monthly cycle of IVIG and Rituximab. The primary endpoint is the change in PRA levels. Secondary endpoints include rate of adverse events and the number of patients successfully transplanted following desensitization therapy.
Conclusion
To be presented to the Keck Hospital Pharmacy and Therapeutics Committee and at Western States Conference for Pharmacy Residents and Fellows in May 2013.

ACPE #:0126-9999-13-135-L01-P
Learning Objectives:

- Explain the impact of high PRA levels on a transplant candidate’s quality of life and the rate of successful transplantation.
- Describe the treatment options available for decreasing PRA levels.


126 - DURATION OF EMPIRIC ANTIMICROBIAL THERAPY IN NEUTROPENIC PATIENTS WITH CANCER AT NORTHWEST MEDICAL CENTER (NMC)

A1. Infectious Disease - Anti-infective Agents

Presented by:
Reem Diri, PharmD
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Presenting on Tuesday, May 14 at 11:30 AM in Garden

Introduction: Cancer patients who receive chemotherapy and develop neutropenia are at risk for severe bacterial infections. Approximately 50% to 60% or more of patients who become febrile have an established or occult infection. Early studies demonstrated rapid and often fatal progression in untreated patients. Current treatment guidelines advocate early hospitalization and administration of broad-spectrum intravenous antibiotics until resolution of both fever and neutropenia. Recent studies in patients with cancer and febrile neutropenia have reported mortality rates between 5% and 20%. In untreated patients, mortality approaches 50% in the first 48. Prompt administration of antibiotics has resulted in response rates of up to 60% to 70% and has decreased mortality to 10%. Hence, febrile neutropenia remains a major cause of morbidity, mortality, and cost among patients with cancer and may limit the delivery of full-dose chemotherapy on schedule. At Northwest Medical Center (NWMC), many of neutropenic patients found to be on a long course of antimicrobial therapy for serious infections.

Methodology: The aim of this study is to assess the use and duration of antimicrobials for neutropenic patients who present to NMC with signs and symptoms of potentially serious infections. The study will be a multi-step process. The first portion of the study is a retrospective chart review of all adult patients admitted with neutropenia from September 2011 until September 2012. Based on potential findings, the investigator will establish evidence based treatment recommendations consistent with international guidelines. During the prospective period; a pharmacist investigator will monitor all patients admitted with febrile neutropenia and if needed communicate recommendations to the prescriber based on evidence-based treatment guidelines. Specifically, the investigator will track the choice of antimicrobial agents, dosing, culture and sensitivity reports, patient clinical response, and total length of antimicrobial therapy and will follow up with the treating physician to ensure antimicrobial therapy is stopped once a patient has completed the recommended course.

Results and Conclusions: Results and conclusions will be presented.

ACPE #:0126-9999-13-136-L01-P
Learning Objectives:
- List the antibiotics that can be used empirically in neutropenic (or febrile neutropenia) patients
- Describe the criteria that are used to address length of antimicrobial therapy in neutropenic (or FN) patients


**127 - EVALUATION OF TRAZODONE AND QUETIAPINE FOR INSOMNIA IN AN INPATIENT PSYCHIATRIC SETTING**

A5. Neuro-Psych or Pain Management Agents

Presented by:

Shadi Doroudgar, PharmD
Touro University California College of Pharmacy Psychopharmacology Residency

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**Presenting on Tuesday, May 14 at 2:00 PM in Palm III**

**INTRODUCTION:** Insomnia is a symptom of most psychiatric disorders, including affective disorders, anxiety disorders, and thought disorders. Most psychotropic drugs used to treat psychiatric disorders are sedating. Benzodiazepines and z-hypnotics are often utilized to treat insomnia. However, chronic use may lead to addiction. As a result, non-habit forming agents are used as alternatives such as trazodone, a triazolopyridine antidepressant, and quetiapine, a 2nd-generation antipsychotic. These drugs are among the non-controlled medications prescribed off-label for insomnia in the inpatient psychiatric population. Although they can be associated with severe side-effects, including anticholinergic and orthostatic side-effects, the safety, efficacy, and usage patterns of these two commonly prescribed drugs as “anti-insomnia” medications have not been contrasted.

**OBJECTIVES:** 1) Contrast the effectiveness of trazodone to quetiapine among inpatient psychiatric patients with regards to total sleep time (TST), number of night-time-awakenings, sleep efficiency (SE), sleep latency (SL), and length of hospitalization. 2) Identify common side-effects of trazodone and quetiapine use and their frequency in the inpatient psychiatric setting.

**METHODOLOGY:** Participants were recruited from St. Helena Hospital Center for Behavioral Health (CBH) in Vallejo, California inpatient population. Inclusion criteria were patients between 18 to 65 years of age admitted between September 2011 through February 2012 to CBH with a physician’s order for trazodone or quetiapine. Patient enrollment target was 50. Exclusion criteria included 1) diagnosis of primary insomnia, 2) pregnancy, 3) simultaneous administration on trazodone and quetiapine, 4) either receiving trazodone or quetiapine up to two weeks prior to study and 5) unable to coherently communicate with the interviewer. Patient demographics, baseline laboratory values, diagnoses, daily dose of study drug, as needed use of temazepam, length of hospitalization and number of past hospitalizations were recorded. Patients were interviewed to subjectively estimate their TST, number of night-time-awakenings, side-effects and sleep quality (Likert Scale 1-4). Nursing sleep records were also used as objective measures of TST, for number and duration of night-time-awakenings, and SL.

**OUTCOMES:** Investigators hypothesized that the data will help determine the efficacy and safety profiles of trazodone and quetiapine use for insomnia in the inpatient psychiatric setting. Full results will be discussed.

ACPE #:0126-9999-13-137-L01-P
Learning Objectives:
Contrast the effectiveness of trazodone to quetiapine among inpatient psychiatric patients with regards to total sleep time (TST), number of night-time-awakenings, sleep efficiency (SE), sleep latency (SL), and length of hospitalization. Identify common side-effects of trazodone and quetiapine use and their frequency in the inpatient psychiatric setting.


128 - EVALUATION OF THE USE OF INSULIN ASPART VERSUS REGULAR INSULIN IN VETERAN PATIENTS WITH TYPE 2 DIABETES
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Randi M. Douglas, PharmD
Southern Arizona VA Health Care System
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Presenting on Wednesday, May 15 at 8:30 AM in Mission Bay Foyer

INTRODUCTION: Diabetes is one of the most common chronic disease states affecting over 340 million people, with type 2 diabetes being most prevalent. It is also commonly associated with long-term complications such as retinopathy, nephropathy, cardiovascular diseases and stroke. Insulin therapy is one way of optimizing glycemic control in order to reduce the incidence of such complications.

OBJECTIVE: The purpose of this study is to evaluate if patients using insulin aspart for glycemic control experience an HbA1c reduction of >1%, less hypoglycemia, and have less frequent provider visits compared to patients using regular insulin.

METHODOLOGY: This research is the result of work supported with resources and the use of the facilities at the Southern Arizona VA Health Care System (SAVAHCS), Tucson AZ. This is a historical prospective study evaluating the use of insulin aspart for glycemic control in Veteran patients. Veterans at SAVAHCS between the ages of 18-89 years of age with type 2 diabetes and active prescriptions for either insulin aspart or regular insulin between February 1, 2004 and July 31, 2011 were screened for inclusion. Patients must also have a baseline HbA1c of >8% within the previous 6 months of study initiation and at least 2 HbA1c levels during the 1-year study period. Patients meeting inclusion criteria will be stratified according to the type of insulin being used. Patients from the insulin aspart group will be case-matched to patients in the regular insulin group according to medications used for glycemic management, age, and BMI, stratified as normal (18-24.9 kg/m2), overweight (25-29.9 kg/m2), obese (30-34.9 kg/m2), and morbidly obese (>35 kg/m2). Excluded patients are those with type 1 diabetes, an HbA1c <8%, no baseline HbA1c or < 2 HbA1c evaluations during the study period.

The primary efficacy endpoint is an HbA1c improvement of > 1% as a result of insulin aspart use versus regular insulin, evaluated by collecting baseline and follow-up HbA1c values. The primary safety endpoint is the incidence of severe hypoglycemia in patients using insulin aspart versus regular insulin, evaluated by assessing the number of emergency room visits or hospitalizations related to complications of hypoglycemia. The secondary outcome of the study is the frequency of provider monitoring, evidenced by the number of provider visits relating to diabetes during the 1-year study period. The authors of this study hypothesize that there will be no difference in HbA1c reduction between patients using insulin aspart or regular insulin, but the use of insulin aspart will result in a reduced incidence of severe hypoglycemia and will require less frequent provider monitoring.
Descriptive statistics will be used to analyze demographic data, where baseline characteristics will be represented using means + standard deviation for continuous variables. The primary efficacy endpoint will be analyzed using the Chi-squared test, while the primary safety endpoint will be analyzed using the Student’s t-test. The secondary outcome will also be analyzed using the Student’s t-test.

RESULTS: To be presented.

ACPE #:0126-9999-13-138-L01-P
Learning Objectives:
  Explain the benefit, if any, of using insulin aspart over regular insulin to achieve better glycemic management
  Explain the risk of hypoglycemia with the use of insulin aspart and regular insulin


129 - PROJECT BOOST YELLOW MEDICATION CARDS: AN INTERDISCIPLINARY EFFORT AIMED AT REDUCING POST-DISCHARGE MEDICATION ISSUES
B4. General Clinical Practice

Presented by:
Caitlin Drayna, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Royal II

INTRODUCTION: The success of transitioning patients safely home from the hospital can be highly variable. Several factors that may play a role include: non-adherent patients, miscommunication between healthcare professionals, complicated medication regimens, difficult to obtain high-risk medications, patient comprehension, and medication costs. At University of California-San Francisco (UCSF) Medical Center, the General Medicine clinical pharmacists have participated in Project BOOST (Better Outcomes by Optimizing Safe Transitions) by implementing Yellow Medication Cards, specifically targeting high-risk patients and those with high-risk medications. Yellow Medication Cards are tailored to the individual patient for discharge medication counseling and teach-back. In collaboration with other healthcare professionals at UCSF Medical Center, the overarching goals of Project BOOST and Yellow Medication Cards are improved medication information flow after inpatient stay and overall reduction of 30-day readmission rate for General Medicine patients. This quality improvement project is intended to evaluate the Yellow Medication Cards and nursing follow-up phone calls to General Medicine patients at UCSF Medical Center to assess impact over time. DEFINITIONS: High-risk medications include: oral/injectable anticoagulants, insulins, long-acting opioids, high-cost opioids, high-cost antimicrobials, high-cost injectables, chemotherapy agents, and any medication with taper schedule. High-risk patients include: those discharged on one or more high-risk medications, those with significant pill burden, or those with multiple admissions. METHODOLOGY: At the time of discharge counseling, the Yellow Medication Card is provided to the patient, with a copy securely stored by General Medicine clinical pharmacists. Yellow Medication Cards are evaluated retrospectively for: patient age, patient sex, total number of medications, number and type of high-risk medications, and number of days hospitalized. RESULTS: Pending interpretation

CONCLUSION: Pending interpretation

ACPE #:0126-9999-13-139-L01-P
Learning Objectives:
- Describe four factors that constitute a high-risk medication.
- List five medications considered high-risk for patient readmission.


**130 - EFFECTS OF WEIGHT-BASED DOSING OF FLUCONAZOLE ON CLINICAL OUTCOMES IN CRITICALLY ILL PATIENTS.**

A1. Infectious Disease - Anti-infective Agents

Presented by:

Antonia Edgar, PharmD
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Presenting on Tuesday, May 14 at 10:00 AM in Garden

Introduction: Hospital-acquired infections continue to be a problem for patients spending extended periods of time in the intensive care unit. Candidemia is currently the 4th most common nosocomial bloodstream infection; and while up to 85% of ICU patients become colonized with Candida spp., only about 10% ultimately develop candidemia. Mortality associated with Candida infections (fungemia and disseminated candidiasis) has increased over the last several decades, and authors report mortality rates approaching 60% in certain ICU wards. Currently, the recommended dosing of fluconazole for candidemia, disseminated candidiasis, and Candida pneumonia is an initial dose of 800 mg (12 mg/kg) and a daily dose of 400 mg (6 mg/kg). Recent evidence suggests the need to use higher doses of highly hydrophillic antimicrobial agents, like fluconazole, in obese patients in order to achieve appropriate drug-specific pharmacokinetic parameters. Failure to adjust drug doses in overweight patients may ultimately result in a poor therapeutic response. The increase in the number of fungal infections and its associated mortality in addition to an increasingly obese population prompts investigation into appropriate fluconazole dosing for critically ill patients.

Methodology: A retrospective chart review was conducted at University Medical Center of Southern Nevada of ICU patients with confirmed fungemia or highly suspected disseminated candidiasis treated with fluconazole between July 2008 and June 2012. Patients were included for evaluation if they met the following criteria: age ≥ 18 years, ICU status upon fluconazole initiation, and fluconazole therapy for greater than 72 hours. Patients were excluded from the analysis if any of the following were identified: non-Candida or fluconazole-resistant isolates; >5 days of therapy with another antifungal; previous prophylactic fluconazole therapy; at-risk populations (transplant, HIV positive, and neutropenic patients); and patients transferred from an external facility with an active infection and concomitant antifungal therapy. Standard demographic information was collected for each patient in addition to length of ICU stay, length of hospital stay, and in-hospital mortality; information regarding use of other antibacterial agents, comorbidities, and data required to calculate scoring systems such as colonization index, Candida score, and SOFA scores for each patient were also recorded. Patients were divided into two groups: those that received an initial fluconazole dose of at least 12 mg/kg followed by a daily dose equivalent to at least 6 mg/kg and those that received less than the recommended doses. The primary outcome is the difference in in-hospital mortality between the two groups. Secondary outcomes analyzed include length of stay, change in SOFA scores during fluconazole treatment, association of predisposing risk factors (parenteral nutrition, abdominal surgery, sepsis, steroid use, etc.), and assessment of mg/kg differences across the patient cohort. Lastly, colonization index and Candida scores were calculated for each patient and evaluated for utility in this patient cohort.
Results / Conclusion: To be presented.

ACPE #:0126-9999-13-140-L01-P
Learning Objectives:
List the most common predisposing risk factors in ICU patients associated with confirmed fungemia or highly suspected disseminated candidiasis.
Describe the percentage of ICU patients that receive appropriate fluconazole dosing for confirmed fungemia or highly suspected disseminated candidiasis.


131 - ASSESSMENT OF INFLUENZA AND PNEUMOCOCCAL VACCINATION RATES AFTER IMPLEMENTATION OF NEW PROCESSES FOR VACCINATION SCREENING, ORDERING, AND DOCUMENTATION.
B4. General Clinical Practice

Presented by:
Gregory Edmiston, PharmD
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Presenting on Tuesday, May 14 at 8:00 AM in Royal III

Introduction: The Joint Commission Core Measures Set for Immunization requires reporting of influenza and pneumococcal vaccination rates for all discharged hospital patients after January 1, 2012 as a performance measure of hospital quality. The objective of this study is to determine the extent to which implementation of new screening, ordering, and documentation processes for both influenza and pneumococcal vaccination alters the baseline rates of vaccination that occurred for patients who were discharged in January, 2012.

Methodology: Prior to commencement, this study was submitted to the Institutional Review Board (IRB) and was given exempt status. Patients less than 18 years of age will be excluded. The hospital’s electronic medical record will be used to identify a representative sample of patients in four practice areas (cardiology, critical care unit, general medical, and surgery) to determine baseline immunization rates for influenza and pneumococcal vaccination for hospital patients who were discharged between January, 2012 and January, 2013. Patient identifying information will be removed upon chart review completion. Post-intervention data will be collected in March and April, 2013. Planned interventions will include improved electronic documentation of vaccination status on admission and discharge, review by pharmacy medication reconciliation staff of persons for whom vaccination status cannot be determined at the admission assessment, revision of vaccine standing orders to include all persons indicated to receive the respective vaccines, development of electronic vaccination alerts to both nursing and pharmacy when vaccines that were ordered were not administered, and provision of staff and provider education. The following data will be collected and compared between baseline and post-intervention periods: patient’s age, whether an immunization screening tool was used, whether the patient’s immunization status was documented within 24 hours of admission, were vaccines ordered, were vaccines administered, whether vaccine information sheet(s) (VIS) were given, whether the patient was immunized against influenza at discharge, and whether the patient was immunized against pneumococcus at discharge.

Results: Pending.
Conclusion: Pending.
ACPE #:0126-9999-13-141-L01-P

Learning Objectives:

Describe the use of Admission Assessment Tools and Vaccine Standing Orders to alter baseline rates of pneumococcal and influenza vaccination to improve compliance with the Joint Commission Core Measures Set for Immunization.

Describe the use of Medication Reconciliation and Provider Education to alter baseline rates of pneumococcal and influenza vaccination to improve compliance with the Joint Commission Core Measures Set for Immunization.


132 - EVALUATING THE TIMING OF ANTIBIOTICS IN PATIENTS WITH SEVERE SEPSIS AND SEPTIC SHOCK BEFORE AND AFTER THE IMPLEMENTATION OF SEPSIS NURSING SCREENING TOOL AT STANFORD HOSPITAL AND CLINICS

A1. Infectious Disease - Anti-infective Agents

Presented by:

Connie Elejalde, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Garden

Background: Severe sepsis and septic shock is associated with high mortality with more than 34,000 deaths occurring each year in the United States. Initial treatment and appropriateness of therapy have shown to improve outcomes in patients with severe sepsis. Early fluid resuscitation and administration of intravenous antimicrobials within sixty minutes of patient presenting with sepsis physiology has shown to improve overall morbidity and mortality.

Objective: The purpose of this study was to evaluate the initiation and timing of antimicrobials in patients with severe sepsis and septic shock before and after the implementation of a sepsis nursing screening tool. The secondary outcome of this study was to evaluate physician utilization of the Sepsis Management order sets and empiric antibiotic selection upon the identification of severe sepsis and septic shock. Results from the study will be used to enhance inpatient sepsis screening and antimicrobial intervention to improve patient outcomes at Stanford Hospital and Clinics.

Methods: Baseline data was collected using the electronic medical record (EPIC) for the months of November-December 2011 in patients with ICD-9 severe sepsis and septic shock diagnosis. Time zero was defined as the time patients met 2 or more SIRS criteria. The following information regarding the antibiotic was collected: choice of empiric antibiotics, time antibiotics were ordered, time to pharmacy verification, and time to administration. This project did not require IRB review, it was determined to be an quality improvement research project.

Results: Will be presented.

Based on the findings of this project, we would anticipate future physician education to encourage the use of the inpatient sepsis order set to ensure early-goal directed therapy is completed for all patients that screen positive for sepsis.

Conclusion: Will be presented.
Learning Objectives:
- Describe the importance of early timing and administration of antimicrobials in patients presenting with sepsis.
- List strategies to improve mortality in patients with sepsis.


133 - LARGE OBSERVATIONAL STUDY EVALUATING RISK FACTORS ASSOCIATED WITH UNCONTROLLED HYPERTENSION
B1. Ambulatory Care

Presented by:

**Dina Elperin, PharmD**
Kaiser Permanente Woodland Hills
[Dina.T.Elperin@kp.org](mailto:Dina.T.Elperin@kp.org)

*Presenting on Tuesday, May 14 at 4:00 PM in Executive 713*

Introduction:
As many as 50 million people in the United States and 1 billion people in the world have been diagnosed with hypertension. This is a problem that affects both men and women and does not discriminate across races and ethnicities. If this condition remains uncontrolled, it can result in permanent long term consequences such as myocardial infarction, heart failure, stroke, and kidney disease. For every 36 patients whose hypertension we can control, we can (statistically) prevent one morbid/mortal event. As our population ages, the prevalence of hypertension will only increase unless risk factors associated with uncontrolled hypertension are identified. Kaiser Permanente’s current hypertension control rate is 84 percent, which is one of the highest control rates in the nation. However, this still leaves the remaining 16 percent that are uncontrolled. The aims of this study are to examine clinical variables to determine if they are associated with a lack of blood pressure control as well as to develop a risk model to identify patients who will have blood pressure that is likely difficult to control. The objective of this study is to identify risk factors associated with uncontrolled hypertension to better focus scarce resources towards factors likely to result in better control.

Methodology:
We conducted a retrospective cohort analysis utilizing the Kaiser Permanente electronic medical record system to identify patients with uncontrolled hypertension during the period January 1, 2010 to December 31, 2012. Blood pressure control was defined as systolic less than 140 and/or diastolic less than 90 (for all patients, regardless of comorbidities). All patients 18 years of age and older with an ICD-9 code for hypertension and at least one elevated blood pressure reading were pooled from the Kaiser Permanente Southern California database. The covariates included more than 20 different clinical factors. These factors will be first assessed with univariate tables of means and proportions of covariates based on controlled or uncontrolled blood pressure status; data will then be analyzed using logistic regression, with calculated p-values <0.05 indicating statistical significance.

Results:
We have identified 878,053 patients in the Southern California database with a hypertension diagnosis. Of these patients, 533,208 patients had at least one elevated blood pressure reading defined as systolic blood pressure greater than or equal to 140 or diastolic blood pressure greater than or equal to 90. The remaining results will be presented upon the completion of this study.
Conclusion:
The conclusions will be presented upon the completion of this study.

ACPE #:0126-9999-13-143-L01-P
Learning Objectives:
List the risk factors associated with uncontrolled hypertension in patients who have access to healthcare, yet remain uncontrolled with current regimen.
Describe the patient characteristics that can be used to develop a predictive model for those patients who have difficult to control blood pressure.


134 - IMPLEMENTING A SCREENING AND TREATMENT PROTOCOL FOR LATENT TUBERCULOSIS IN PATIENTS WITH HEMATOLOGIC MALIGNANCES IN A SOUTHERN CALIFORNIA MEDICAL CENTER
A1. Infectious Disease - Anti-infective Agents

Presented by:
Manuel Escobar, PharmD
University of California, San Diego Health System
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Presenting on Tuesday, May 14 at 11:00 AM in Garden

Introduction:
Tuberculosis is caused by the pathogenic species of the Mycobacterium tuberculosis complex. Following a primary tuberculosis infection, adequate T-lymphocyte responses are essential to preventing the progression of disease. Patients with hematologic malignancies are at an increased risk for reactivation of latent tuberculosis due to T-cell immunodeficiency caused by the disease itself or the chemotherapy used as treatment. The incidence of tuberculosis varies significantly depending on country of birth and underlying hematologic malignancy. Foreign born patients with hematologic malignancies have been reported to have a tuberculosis rate of 50-100 times higher than US- born patients. The highest rate has been identified among allogeneic hematopoietic stem cell transplant patients, followed by patients with non-Hodgkin lymphoma and patients with Hodgkin lymphoma.

In the treatment of latent tuberculosis, isoniazid is given at 5 mg/kg/day (max of 300 mg) for 9 months and until immunosuppression dosages are substantially reduced. Isoniazid therapy carries the risk of adverse effects including hepatotoxicity and peripheral neuropathy. Isoniazid hepatotoxicity occurs in 0.1-0.15% of patients among the general population during preventative therapy. The data on the tolerability of isoniazid in hematologic malignancy patients started on treatment of latent tuberculosis is limited.

Methodology:
Prospective, single center study using data collected from UCSD patient databases. Study will begin in February 2013 and patient data will be collected throughout therapy if QFT-IT is found to be positive and treatment is initiated. All patients presenting with hematologic malignancies will be screened by the treating physician for latent tuberculosis as a part of the standard of care for these patients using the QFT-IT method. Data collected will include patient demographics, type of malignancy, quantiferon result, liver function tests at baseline and throughout therapy, and incidence of other side effects related to isoniazid therapy. We emphasize that our research will involve prospective medical record review only. All medical tests, diagnostics, or treatment
decisions will be carried out at the discretion of the treating physician. The treatment team will have access to
guidelines devised by clinical experts at UCSD based on Infectious Diseases and American Thoracic Society
guidelines. The newly introduced current practice at UCSD is to perform a quantiferon (QFT-IT) screening on all
hematologic malignancy patients upon entering the system. If the QFT-IT value is greater than 1.0, treatment for
latent tuberculosis with isoniazid should be initiated once the patient has successfully completed and tolerated
the first round of chemotherapy. If QFT-IT value is between 0.35 and 1.0, a retest should be performed in 3-6
months. Discontinuation of isoniazid due to hepatotoxicity during treatment of latent tuberculosis is felt to be
warranted when LFTs have increased 5 times the upper limit of normal or 3 times if the patient presents with
symptoms of liver toxicity.
Results and conclusion:
Data collection in progress

ACPE #:0126-9999-13-144-L01-P
Learning Objectives:
1. Describe the incidence of latent tuberculosis in patients with hematologic malignancies at UC
San Diego Health System
2. Describe the safety and tolerability of isoniazid for treatment of latent tuberculosis in patients
with hematologic malignancies receiving chemotherapy


135 - REVISING CURRENT PRACTICE AND OPTIMIZING THE PHARMACIST ROLE IN
IMPROVING PAIN MANAGEMENT RATINGS ON THE HCAHPS SURVEY
A5. Neuro-Psych or Pain Management Agents

Presented by:
Leslie Esparza, PharmD
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Presenting on Tuesday, May 14 at 2:30 PM in Palm III

Purpose: Pain is perhaps the most distressing symptom experienced by hospital patients and historically pain
management has been less than adequate. The Hospital Quality Alliance was created by federal policy makers
and private organizations, in conjunction with the Centers for Medicare and Medicaid Services, to conduct
HCAHPS surveys evaluating patients’ experience during hospitalization. Consumer perspectives are portrayed
through survey results which lead to financial reimbursements for institutions compelling many institutions to
strive for improvement on these HCAHPS scores. Pain management is an integral portion of the consumer
evaluation. Results from the latest surveys at Providence Sacred Heart Medical Center (PSHMC), a 644 bed level
II trauma facility located in Spokane, Washington, showed room for improvement. Currently, pharmacists are
consulted for patients with uniquely challenging pain management issues. Interdisciplinary pain management
teams, with pharmacist involvement, have been described and benefits shown for applying the evolving
principles of pharmaceutical care. Pharmacists are increasingly incorporating patient education and counseling
into their daily operations with increasing positive therapeutic outcomes. The objective of this project is to
establish a standard policy/procedure for pharmacy involvement during pain consultations and implement in a
pilot program intended to improve pain management ratings on HCAHPS surveys.
Methods: This project is exempt from IRB review because it is a performance improvement project. A gap analysis was conducted to identify the population of patients and situations when pharmacist consultations have historically been requested at PSHMC. Review of historic pharmacist clinical intervention data for pain consults and pharmacist interview occurred. Based on the gap analysis, areas for improvement were clarified and developed to clearly outline the pharmacist’s role in pain consults. The HCAHPS data related to pain control for most recent year, including the latest quarter (April 2012 to June 2012), was reviewed and areas with greatest potential for improvement were determined. A process for improving documentation and the patient experience related to pain was developed; and selected for use to pilot this process. Individuals in which a pain consult was requested were targeted in this pilot program. A myriad of information was collected and documented appropriately. A follow up phone call to the patient was made, where the pain related HCAHPS questions will be asked. The results of the follow up phone calls and their respective scores will be compared and reevaluated against the previous quarter to analyze effectiveness of this new policy/procedure and pilot program in increasing HCAHPS scores.

Results/Conclusion: Characterization of current pain management practice, historic HCAHPS results, summary of project implementation, and results will be presented.

ACPE #:0126-9999-13-145-L01-P

Learning Objectives:
1. Describe the role of pharmacy in improving pain management ratings on HCAHPS surveys.
3. List the steps involved to establish a standard policy/procedure for pharmacy involvement during pain consultations.


136 - EVALUATION OF THE NEED FOR EMERGENCY DEPARTMENT PHARMACY SERVICES IN A COMMUNITY HOSPITAL

B4. General Clinical Practice

Presented by:

Monica Evans, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Royal III

INTRODUCTION: Poudre Valley Hospital (PVH) is a 241-bed regional medical center for residents of northern Colorado, southern Wyoming and western Nebraska. In 2012, PVH had 53,000 emergency department (ED) visits. Approximately 15% of these visits resulted in admission to the hospital, and nearly 13% of all hospital admissions entered through the emergency department. The purpose of this project is to identify and evaluate the need for clinical pharmacy services and ideally implement those services in the ED at PVH.

METHODOLOGY: The assessment of need was conducted as a cross-sectional study of ED providers regarding clinical pharmacy services at PVH. A web-based questionnaire was developed utilizing current literature and expert consensus. The questionnaire was sent to ED providers, including midlevel providers (nurse practitioners and physician assistants), via internal email groups. The questionnaire included questions about general perceptions of pharmacy services in the ED and the ideal role and function of the ED pharmacist. Data were compiled and statistically analyzed.
RESULTS Of the 42 ED providers surveyed, 19 questionnaires (44%) were completed. Notable results are included. Eighty four percent (16/19) of respondents had contacted the main pharmacy at least one time during their past 5 shifts and 73% (14/19) indicated this number would increase with a pharmacist present in the ED.

One hundred percent (19/19) of the ED providers surveyed indicated a pharmacist would be useful in identifying medication interactions, following up on culture data, counseling patients on outpatient therapy, providing staff education, monitoring and reporting adverse drug reactions and ensuring compliance with CMS and Joint Commission standards. Likewise, 18 out of 19 providers surveyed indicated a pharmacist would be useful in providing recommendations on medications used in pregnancy, calculating drip rates and preparing IVs. These expanded clinical pharmacy services in the ED would ostensibly translate into improved patient care at PVH. The results of this survey will be presented to hospital administration in an attempt to secure appropriate funding for pharmacy services in the ED at PVH.

CONCLUSION: The results of our survey show that the emergency department providers at Poudre Valley Hospital support the expansion of pharmacy services. As demonstrated, providers frequently utilize the main pharmacy for consultations. The number and scope of these consultations would increase if a clinical pharmacist was present in the emergency department, thus improving patient care.

ACPE #:0126-9999-13-146-L04-P
Learning Objectives:
   Explain the need for an ED pharmacist in a community hospital setting.
   Describe the ideal role of an ED pharmacist in a community hospital setting.


137 - DISCHARGE TRANSITIONAL CARE OF CONGESTIVE HEART FAILURE PATIENTS: A TEAM-BASED APPROACH TO POST-DISCHARGE CARE
B4. General Clinical Practice

Presented by:

Noah Fang, PharmD
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Presenting on Tuesday, May 14 at 9:00 AM in Royal III

One of the new provisions of the Affordable Care Act includes restructuring of the reimbursement model for healthcare systems to focus on the holistic care of the patient, rather than to focus on the traditional fee-for-service. Certain Medicare reimbursement will be tied to re-admission rates of certain disease states (eg congestive heart failure [CHF], myocardial infarction, pneumonia). Pharmacists are poised strategically as the medication experts that can close the gap of care as patients leave the hospital and before their follow-up visit. Currently at our hospital, once patients are discharged, they do not have a source of inpatient contact post-discharge. This congestive heart failure pilot program will continue to follow patients once they leave the hospital in an attempt to reduce avoidable re-admissions.

The goal of the program is to provide better discharge/transitional care for a disease-specific group (CHF) that can be applied to other disease states in the future. Additionally it is our goal to improve pharmacy, case management, nursing, and physician interventions in the discharge process for medically complex patients, while also strengthening medication/disease education, adherence, and follow-up in transitioning levels of care from acute health-care institutions to other health-care facilities and/or to the home. Lastly, we would want to
empower the patients to be advocates for their medical care and to establish relationships for patients to have a source of contact within the hospital during their transition to outpatient care. This prospective study will have case management refer CHF patients that would benefit from a pharmacist consultation. A pharmacist will interview the patients upon admission to review home medications and start the disease state education process. Upon discharge, a pharmacist will also review changes to his/her medication regimen. Patients will continue to be followed to verify medication adherence, to monitor filling new medications, and to ensure post-discharge follow-up care, including a physician visit, for up to 5 weeks after discharge in hopes of closing the gap between discharge and outpatient follow-up care. Outcomes measured will include the change in 30-day readmission rate from baseline and the number of interventions with the patient and providers. We expect to see a reduction in re-admission with pharmacist interventions, which can later be used to justify continuation of the program. Final results will be presented at the conference.

In the evolving healthcare arena, pharmacists are considered the trusted medication experts. Having a pharmacist to be involved in direct patient care and interventions may be a promising path for the future of the profession.

ACPE #: 0126-9999-13-147-L01-P

Learning Objectives:
- Explain gaps in transitional care where a pharmacist can help improve patient care.
- Explain ways to work collaboratively with other disciplines to reduce preventable re-admissions.


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138 - EVALUATION OF CITALOPRAM INDUCED QTc PROLONGATION IN A VETERAN POPULATION (ECQIP)

A5. Neuro-Psych or Pain Management Agents

Presented by:

Maryam Fazel, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Palm III

Introduction: This research is the result of work supported by the resources and the use of the facilities of the Southern Arizona VA Health Care System (SAVAHCS), Tucson, Arizona. There has been conflicting data regarding the cardiac safety profile of citalopram. In August 2011, the FDA issued a Drug Safety Communication (DSC) advising against the use of citalopram at doses greater than 40 mg and warning about post-marketing reports of QT interval prolongation and Torsade de Pointes (TdP) associated with citalopram. In March 2012 this DSC was revised advising against using any dose of citalopram in patients with certain conditions due to risk of QT prolongation. The FDA’s decision was based on post-marketing reports of QT prolongation and TdP in patients treated with citalopram and the results of an unpublished study prospectively evaluating the effects of citalopram on QTc prolongation. The results of this study demonstrated a possible dose-dependent QTc prolongation in patients using citalopram.

Purpose: This study will evaluate whether the use of citalopram in a Veteran population is associated with QTc prolongation. For secondary endpoints, the study investigates whether citalopram effects are dose-dependent,
and whether using citalopram concomitantly with other medications that are known to prolong QTc interval or with medications that inhibit clearance of citalopram increase risk of QTc prolongation.

Methodology: This historical prospective cohort study uses the electronic medical record database of SAVAHCS to query patients. Demographic information such as age and sex as well as the initial dose of citalopram and the highest dose of citalopram prescribed will be obtained. Additionally, name of medications with known and conditional risk of TdP and medications that inhibit CYP2C19 that are taken concomitantly with citalopram will be obtained. Subjects ages of 18-87 who were dispensed a new prescription for citalopram between January 1, 2001 and July 31, 2010 and are adherent as defined by a medication possession ratio (MPR) \( \geq 0.8 \) will be included in this study. Exclusion criteria include subjects without an electrocardiogram (ECG) from SAVAHCS within the 18 months prior to starting citalopram and who do not have an ECG from SAVAHCS \( \geq 7 \) days to 2 years after initiating the medication, subjects with diagnosis of heart failure identified by ICD-9 coding, subjects who use an implanted pacemaker and/or cardioverter defibrillator as identified by ICD-9 coding, and subjects who initiated citalopram treatment outside of SAVAHCS. For the primary endpoint, the mean QTc interval at baseline will be compared to the mean QTc interval on a stable dose of citalopram.

Results/Conclusions: Will be presented.

ACPE #:0126-9999-13-148-L01-P

Learning Objectives:

- Describe the impact of citalopram on QTc interval in a Veteran population.
- Describe the impact of concomitant use of medications with known or conditional risk of TdP with citalopram on risk of QTc prolongation.


### 139 - TAKING A STEP TOWARDS REDUCING INTENSIVE CARE UNIT (ICU) OVERSEDATION

**B3. Critical Care**

**Presented by:**

**Nicole Ferrigno, PharmD**

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**Presenting on Wednesday, May 15 at 4:30 PM in Executive 713**

Introduction: The Society of Critical Care Medicine and American Society of Health-System Pharmacy recently updated its Pain, Agitation, and Delirium guidelines in order to improve the care of Intensive Care Unit (ICU) patients. In accordance with the revised guidelines, Central Washington Hospital has developed a new protocol that aims to decrease oversedation amongst ICU patients. The objective of the study is to determine if the implementation of the new protocol minimizes oversedation in ICU patients by reducing the use of intravenous benzodiazepine infusions.

Methodology: The hospital’s electronic medical record system was used to identify patients who, over a sixty-day time period, were mechanically ventilated in the ICU. Patients who were mechanically ventilated for less than 48 hours or expired during ICU stay were excluded from the performance improvement (PI) project. The data collected included demographics, length of ICU stay, number of ventilator days, average doses of IV fentanyl, average doses of IV midazolam, and frequency of daily sedation interruptions. Daily sedation interruptions were defined as change in rate to zero for greater than one hour. Patient confidentiality was
maintained by the use of computer generated, randomized code numbers in place of patient identifiers. Average length of ICU stay, number of ventilator days, doses of IV fentanyl, doses of IV midazolam, and frequency of daily sedation interruptions were calculated. The data was analyzed and compared to baseline data gathered prior to protocol implementation.

Results: Data analysis included baseline data, as well as data collected from 52 patients following protocol implementation on October 15, 2012 and continuing for 60 days. Only patients who were mechanically ventilated for 48 hours or greater and those who did not expire during their ICU stay were included in data collection. Prior to initiation of the new protocol, patients were mechanically ventilated for an average of 4 days and remained in the ICU for an average of 2.5 days. Following protocol initiation, patients were only mechanically ventilated for an average of 3.26 days while remaining in the ICU for an average of 2.25 days. Additionally, while all patients analyzed for the purpose of baseline data collection received midazolam, only 19% of patients received midazolam once the new protocol went into effect. Interestingly, fentanyl use did not increase in the patient population utilizing the new protocol. Sedation holidays were low with only 45% and 31% of patients receiving them, respectively, at baseline and following protocol implementation.

Conclusion: Due to the implementation of the new ICU ventilator protocol, patients are remaining mechanically ventilated for shorter amounts of time. Additionally, patients are requiring a shorter duration of critical care. Midazolam is no longer being heavily used in these critically ill patients, which is associated with improved patient outcomes. Despite previous thoughts that fentanyl use would increase in the absence of midazolam use, fentanyl use has remained stable. The main limitations of the PI project include inability to electronically document sedation holidays by the nursing staff and the propofol shortage.

ACPE #:0126-9999-13-149-L01-P

Learning Objectives:

- List pharmacotherapy management options that decrease oversedation in the Intensive Care Unit (ICU).
- Describe the patient population at risk for oversedation in the Intensive Care Unit (ICU).


140 - STANDARDIZING THE PHARMACIST PROCESS FOR ASSESSING AND DOCUMENTING ANAPHYLAXIS ALLERGIES AT A MULTI-SITE HOSPITAL SYSTEM

D1. Medication Safety

Presented by:

Elise Fields, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Palm I

Introduction: At Legacy Health in September 2010, as part of a new electronic medical record (EMR) build, allergy information was transferred from the existing electronic charting system. As part of the initial build, not all allergy alerts were presented to all provider types; although direct drug matches have always been presented, several other allergy alert types were filtered. In January 2012, a patient with a documented penicillin allergy was administered a cross-sensitive cephalosporin and experienced a severe adverse drug event (ADE). The documented ADE stimulated a conversation on the build decision. To increase pharmacist awareness of documented drug allergies, the alerts for cross-drug sensitive allergies were removed from “filter” status and became viewable to pharmacists during drug order verification.
To assess the impact of having pharmacists view cross-sensitive allergy alerts, a report was generated from the EMR in May 2012. During a thirty-day period, cross-sensitive allergy alert overrides totaled 8,934, and allergy alert overrides for all override types (direct and cross-sensitive drug matches) totaled 16,236. From the total number of overrides, pharmacists overrode 197 alerts for anaphylaxis, the most severe type of allergic reaction; of these, 46 were cross-sensitive drug anaphylaxis allergy alerts and 151 were direct drug anaphylaxis allergy alerts.

Interviews with pharmacists involved indicate that overrides for anaphylaxis alerts typically occur only after a review of the drug allergy information documented in the patient chart. Of the 197 pharmacist anaphylaxis overrides, 145 (74%) lacked clear documentation in the allergy activity of the patient’s electronic health record, indicating that pharmacists are not consistently modifying the anaphylaxis documentation to explain the override reason, which may result in duplicate allergy clarifications by multiple pharmacists. Thus, having a standardized process for pharmacists to investigate and clarify anaphylaxis allergies will improve the accuracy of patient allergy records and increase the efficiency of pharmacist activity.

Methodology: 1. Develop a standardized process for pharmacists to assess and document anaphylaxis allergies during order verification. Process to include how to investigate, clarify, and document drug allergies in patient charts. 2. Obtain approval of process from pharmacy clinical coordinator group and managers. 3. Survey pharmacists pre and post-education via questionnaire to assess understanding of anaphylaxis reactions and of documentation processes for anaphylaxis reactions in the EMR. 4. Provide targeted education to pharmacists on process standardization. Education will include resident speaking at pharmacist meetings, creating a handout demonstrating process flow, and providing a required educational module to assess competency in standardized process. 5. Compare pre- and post-pharmacist education data. 6. Repeat data collection over 30 day period.

Primary outcome measure: change in number of anaphylaxis allergy overrides lacking documentation in EMR.

Results: to be presented

Conclusion: to be presented

ACPE #:0126-9999-13-150-L01-P

Learning Objectives:

- Explain the process for investigating documented anaphylaxis allergies during drug order verification
- Explain the process for pharmacists’ documentation of the allergy reaction information in the EMR.


**141 - THE EFFECT OF STANDARD PROCESS TO REDUCE READMISSION IN PATIENTS WITH HEART FAILURE**

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

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**Presenting on Tuesday, May 14 at 11:30 AM in Royal V**

Introduction

Heart failure (HF) is the most common reason for readmission after hospital discharge and accounts for more healthcare costs than any other medical condition in the United States. HF is a condition that can be difficult to manage for patients and frequently results in readmissions. More than 20% of patients with a discharge
diagnosis of heart failure are readmitted within the first 30 days and up to 50% are readmitted within 6 months. Hospitals with readmission rates higher than the national average will begin to see a reduction in reimbursement from CMS (Center for Medicare and Medicaid Services).

Currently nursing handles discharge counseling at Virginia Mason Medical Center. This service is appropriate for most patients, although, patients at high risk of readmission may benefit from more comprehensive discharge counseling by a pharmacist.

At Virginia Mason Medical Center we have found that standardization, and a team approach, leads to improved safety and outcomes for patients. A standardized approach will be developed for discharge counseling for these patients. This will ensure each patient receives a more comprehensive explanation of their medications and the importance of these in relation to their condition. They will also be given an informative guide to help them manage their diet, disease state and medications.

Methods

The pharmacist intervention will focus on HF patients in the telemetry unit as flagged in the Electronic Health Record. The pilot program will require a daily assessment of select patients using a previously validated scoring tool, LACE (Length of stay, Acuity, Comorbidities, and Emergency room visits within the last 6 months). The LACE tool is used to evaluate patients’ risk of readmission. Patients with a score of ≥11 will signify that the patient is at high risk of readmission and trigger the pharmacist to do a comprehensive discharge counsel. Data will be collected over a 2 month period measuring readmission rates of patients in this program. This will be compared to current Virginia Mason Medical Center HF readmission rates. The primary goal is to reduce the frequency of readmission of these patients. Secondary outcomes include an assessment of the accuracy of the LACE scoring tool and identifying any missed intervention opportunities as well as time to complete assessment per patient.

Results and Conclusion will be presented at Western States Conference.

ACPE #:0126-9999-13-151-L01-P

Learning Objectives:

1. Describe the key points of the standardized discharge instructions for heart failure patients.
2. Assess the impact of pharmacist lead discharge counseling on 30-day readmission of heart failure patients.


142 - EFFECT OF HYPOGLYCEMIA AND GLYCEMIC VARIABILITY ON CLINICAL OUTCOMES IN THE MANAGEMENT OF HOSPITALIZED DKA PATIENTS

B3. Critical Care

Presented by:

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Presenting on Tuesday, May 14 at 9:00 AM in Executive 713

Diabetic ketoacidosis (DKA) is a life-threatening metabolic complication of diabetes that is responsible for more than 170,000 Emergency Department visits annually. DKA has a significant economic impact on health care resources, with treatment costs estimated at more than 2.4 billion USD per year. In an effort to decrease intensive care and hospital lengths of stay, several protocols for the management of DKA have been described in
the literature with reported rates of hypoglycemia averaging 5-15%. The specific aim of this single-center, retrospective cohort study is to compare the effects of insulin infusion protocols for DKA management on the prevalence of hypoglycemic events, glycemic variability, hospital length of stay and mortality. Data will be collected from the medical records of patients treated for DKA before and after protocol implementation. The chart review has both a retrospective and prospective phase. All patients with a diagnosis of diabetic ketoacidosis (ICD-9 code 250.1) who were admitted October 2010 through October 2012 are included in the pre-protocol analysis (retrospective phase). The post-protocol analysis will include DKA patients admitted after protocol implementation (expected date of implementation: March 2013, prospective phase) through the end of study duration. Patients will be excluded if they are less than 18 years old, are pregnant, or have a positive anti-insulin antibody test. The primary endpoint is hospital length of stay. Secondary endpoints include number of hypoglycemic events requiring intervention defined as blood glucose less than 60 mg/dL, time to anion gap closure, re-emergence of an anion gap after initial correction, rate of correction of hypoglycemia in mg/dL/hr and glycemic variability. Descriptive statistics of mean and standard deviation for continuous variables and frequency distribution for categorical variables will be used to summarize the study findings for the pre-implementation analysis. Differences between the pre- and post-implementation variables will be evaluated using Fisher exact test or the paired student t-test as appropriate. Statistical significance will be indicated by a p-value of less than 0.05. Results and conclusions will be presented.

ACPE #:0126-9999-13-152-L01-P
Learning Objectives:
- Explain the significance of glycemic variability in hospitalized patients.
- Describe recent data suggesting dysglycemia and high glycemic variability are independent risk factors for in-hospital mortality.


143 - DEVELOPMENT AND IMPLEMENTATION OF A WORKFLOW REDESIGN FOR PATIENTS RECEIVING CONTINUOUS HEPARIN INFUSION TO IMPROVE SAFETY OUTCOMES

D1. Medication Safety

Presented by:

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Presenting on Tuesday, May 14 at 10:00 AM in Palm I

Medications are considered high risk if they have an increased potential for adverse events that can cause serious harm. Joint Commission standard MM.01.01.03 requires that hospitals identify and safely manage high alert medications. These medications have a heightened risk of causing harm when used in error. Memorial Hospital has narrowed the ISMP high alert medication list down to the following high-risk drug categories that are routinely tracked in the hospital: anticoagulants, insulin, potassium, narcotics, sedatives, and chemotherapy. Adverse drug events are documented through Quantros™, an electronic monitoring system, and are reviewed weekly by the Medication Error Review Team (MERT). MERT identified a higher error rate for heparin for continuous infusion than for the other high-risk medications over the past year. The objective of this study is to evaluate errors related to continuous heparin for infusion and to identify system issues that can be corrected by
redesigning workflows, updating policy and procedures, updating protocols, and reinforcing education for safe use of this medication. During the first quarter of 2012 continuous heparin for infusion errors made up 3% of the total reported medication errors at Memorial Hospital. This error rate jumped to 7% of reported medication errors during the second quarter. The four major categories of errors include: delays in starting the drips, failure to double check medication dose calculations, heparin drips not stopped, and improperly managed protocols. A formal workflow committee outlined the utilization of this drug to determine points of variability. A failure mode effects analysis (FMEA) was performed to determine potential areas for workflow optimization. This committee will also drive process change by updating the continuous heparin for infusion policies and procedures, updating the heparin administration protocol, developing computerized documentation pathways, and by educating nurses and providers. If successful, this systematic approach will be used to modify other high-risk medication processes in the future. Outcomes of this study will be assessed by measuring error rates and compliance to protocols and procedures at baseline and post-intervention. The Institutional Review Board granted this study exempt status.

ACPE #:0126-9999-13-153-L01-P

Learning Objectives:
- Describe the key elements to be included in a safe process for administration and documentation of the heparin infusion protocol.
- Describe the different types of continuous heparin infusion errors that may occur and list potential interventions to prevent these errors.


144 - RISK EVALUATION AND MITIGATION STRATEGIES (REMS): ENSURING COMPLIANCE WITH MEDICATION GUIDE DISTRIBUTION REQUIREMENTS.

D1. Medication Safety

Presented by:
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Presenting on Tuesday, May 14 at 10:30 AM in Palm I

Introduction: The Food and Drug Administration (FDA) has the authority to require drug manufacturers to complete Risk Evaluation and Mitigation Strategies (REMS) pertaining to medications with significant toxicities or adverse events. As part of the mission to ensure medication safety, Medication Guides are dispensed to educate patients regarding the benefits of a potentially harmful medication as well as the risks. The FDA has recently clarified the distribution of REMS Medication Guides in various patient care settings. The goal of the quality improvement project is to design a standardized workflow process to assure the institution is compliant with FDA distribution requirements of REMS Medication Guides in outpatient clinics and infusion centers. Methodology: The quality improvement project took place in outpatient clinics and infusion centers within the hospital system. An institution specific GAP analysis was completed by a PGY1 resident pertaining to REMS qualifying medications prescribing and administration patterns in the outpatient infusion centers. Hospital inpatient and retail settings were excluded. Data was analyzed to catalog current REMS medications that were being dispensed and which of the medications identified needed to meet the Medication Guide requirement. Lean principles were applied throughout the project. The oncology PGY2 resident created a REMS survey tool to
identify a current state of practice and identify differences in workflow at the various locations. The current state of practice was mapped and deficiencies were noted. Under the leadership of the oncology PGY2 resident, a multidisciplinary workgroup designed and came to a consensus for an effective standardized operational process. Documentation, distribution and accountability measures were incorporated to ensure effective Medication Guide distribution within the outpatient clinics and infusion centers. Additionally, a standardized process was completed to ensure new medications added to the institution formulary with a Medication Guide requirement were not made available to providers and patients without meeting the REMS requirements. Education and training was provided to interdisciplinary staff to ensure REMS requirements are maintained after residency completion.

Results and Conclusion: Presented at Western States Pharmacy Conference, May 2013. IRB approval was not needed.

ACPE #:0126-9999-13-154-L01-P
Learning Objectives:
   Describe the purpose of distributing and documenting FDA REMS Medication Guides.
   Compare the REMS Medication Guide distribution requirements for various practice settings within a hospital system.


145 - PERFORMANCE IMPROVEMENT IN THE MANAGEMENT OF THROMBOTIC EVENTS WITH THE USE OF UNFRACTIONATED HEPARIN
B4. General Clinical Practice

Presented by:
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Presenting on Tuesday, May 14 at 9:30 AM in Royal III

Purpose: The addition of newer anticoagulants and the increased use of low molecular weight heparins have broadened our options for the treatment of thrombotic disorders. Despite these developments, the use of unfractionated heparin (UFH) remains an indispensable agent. The primary objective of this performance improvement project is to evaluate, and determine if our current UFH infusion protocol adequately achieves therapeutic values within 24 hours after initiation. Secondary objectives will include a comprehensive literature review with implementation of an updated infusion protocol, nurse education, and documentation strategies to facilitate increased performance.

Methods: As a performance improvement project, this retrospective MUE is exempt from the Institutional Review Board. The MUE was completed at PSHMC, a 644 bed tertiary care facility and referral center for cardiovascular care, and level one stoke center. Inclusion criteria included age greater than 18 years, administration of UFH ≥ 24 hours, and receiving heparin via the full dose or cardiac dose infusion protocol. Exclusion criteria included patients receiving an infusion <24 hours, patients receiving continuous renal replacement therapy, pregnant women, and patients < 18 years of age. Data collection included demographic variables (age, sex, height, weight), principle diagnosis, laboratory values (aPTT), and details with regards to the heparin dosing regimen and documentation.
Results: PSHMC patient specific data analysis identified kinetic variables correlating to non-predicted therapeutic response based on the current fixed dose infusion protocol and a need for revision of our current dosing nomogram. With an average weight of 110kg in our MUE, the current nomogram produced 53% of patients with subtherapeutic aPTT’s at 24 hours, indicating our initial bolus and infusion rates should be increased in this subset of patients in order to achieve therapeutic targets more efficiently. Poor renal function (<30 mL/min) and age (>70 years) were associated with low percentages of patients therapeutic at 24 hours. These variables were also the largest predictor of producing supratherapeutic aPTT’s, however the incidence of bleeding remained low in these patients. Revisions to our protocol based in our literature review of current guidelines for acute coronary syndromes, treatment of venous thromboembolism, and original studies utilizing continuous weight based nomograms, have been evaluated through Pharmacy and Therapeutics Committee, as well as our Cardiac Care Committee. Implementation of the new infusion protocol, nurse education, and documentation strategies are currently in process. Results of the post-implementation MUE will also be presented.

ACPE #:0126-9999-13-155-L05-P
Learning Objectives:
- Compare the efficacy between the previous fixed dose, and revised continuous weight based dose adjustment nomograms in achieving therapeutic levels of anticoagulation at 24 hours.
- Explain if the implementation of a revised dosing protocol, nurse education, and documentation increased performance of our continuous infusion heparin protocol.


146 - MAJOR BLEEDING WITH DABIGATRAN AND RIVAROXABAN IN PATIENTS WITH ATRIAL FIBRILLATION
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
Gabriel Fontaine, PharmD
Intermountain Healthcare
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Presenting on Tuesday, May 14 at 2:00 PM in Royal V

Purpose: The incidence of major bleeding in patients with atrial fibrillation (AF) taking dabigatran or rivaroxaban is well documented in large randomized controlled trials. However, in clinical practice the novel oral anticoagulants (OAC) may be used in a broader population not represented in controlled studies. The objective of this study is to compare the rate of major bleeding in subjects taking a novel OAC in a real-world setting against rates reported in major clinical trials. In addition, we aim to identify correlations between patient-specific variables and rates of major bleeding.

Methods: This study has been approved by the Institutional Review Board at Intermountain Medical Center. Given the design of the study patient consent was waived. We conducted a retrospective, electronic medical record and chart analysis. Data was gathered from all outpatient clinics and hospitals within the Intermountain Healthcare System linked to the Enterprise Data Warehouse (EDW). All subjects on either rivaroxaban or dabigatran with a diagnosis of AF were included. Data was extracted using Natural Language Processing, electrocardiogram dictation, and ICD-9 coding for diagnosis of atrial fibrillation and National Drug Code (NDC) numbers for medications. Data points collected include patient age, height, weight, gender, location of bleed,
duration and dose of study drug, past medical history, and current medications. Major bleeding is defined as any bleeding that leads to death; bleeding into a critical area or organ; a decrease in hemoglobin level of 2 g/dL; or infusion of two or more units of packed red blood cells or whole blood. The rate of major bleeding was calculated as a percent and compared to the rate of major bleeding in randomized controlled trials. Results and conclusions will be discussed.

ACPE #:0126-9999-13-156-L01-P

Learning Objectives:
- List risk factors associated with major bleeding with dabigatran or rivaroxaban.
- Assess the use of new oral anticoagulants in patient populations excluded from clinical trials.


**147 - IMPACT OF A PHARMACIST CONSULT SERVICE ON PHYSICIAN COMPLIANCE WITH THE MEDICATION RECONCILIATION PROCESS**

B4. General Clinical Practice

Presented by:

**Brent Footer, PharmD**
California Pacific Medical Center
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*Presenting on Tuesday, May 14 at 10:00 AM in Royal III*

Introduction: An accurate medication history is an integral part of patient assessment and is necessary to avoid interrupted or inappropriate therapy as well as assess for medication-related issues leading to hospitalization. Patients transitioning between practice settings are most susceptible to these types of medication errors. As a result, the need to “maintain and communicate accurate patient medication information” remains a Joint Commission National Patient Safety Goal. At California Pacific Medical Center (CPMC) nurses perform medication reconciliation and enter home medications into an electronic database. The process is considered complete when the attending physician signs-off and attests to the accuracy of the medication list. Compliance, however, with sign-offs among a select group of physicians, such as, surgeons is poor due to unfamiliarity with usually prescribed medications. As a result, our institution has implemented a pharmacist medication reconciliation consult service. Consulted pharmacists verify the accuracy of previously completed medication lists. The primary objectives of this study are to characterize the types and number of medication errors/discrepancies discovered by the consult pharmacist and determine if the consult service improves physician compliance with electronic sign-offs of the medication list. A secondary objective is to determine if factors, other than pharmacy consultation, influence physician sign-off.

Methods: The medication reconciliation process is performed by nurses and then entered into an electronic database. After the initial intake but before medication list sign-off upon discharge, a physician may choose to consult a medication reconciliation pharmacist. The pharmacist then verifies the accuracy and completeness of the information input into the electronic database. After pharmacist review, the physician is asked to sign-off on the medication list. The number and type of discrepancies noted by the consulting pharmacist will be displayed for descriptive purposes and possible areas for quality improvement. The consult service will be evaluated by comparing physician sign-off percentages between pharmacy consulted patients and non-consulted patients admitted during the study period. Additionally, the overall sign-off percentage in all patients before and after implementation of the consult service will be compared. A comparison of patient
characteristics between signed and unsigned medication lists will be completed in order to examine potential influences on physician sign-off. The patient characteristics will also serve to provide information on the types of patients undergoing consultation and aid in identifying patients that could benefit from pharmacist consultation.

Results/Conclusions: The findings of the study will be presented upon completion.

ACPE #:0126-9999-13-157-L05-P

Learning Objectives:
- Describe the potential benefits a pharmacist consult service could provide in the medication reconciliation process
- Describe patient characteristics or other factors that led to poor physician compliance with the medication reconciliation process


148 - EFFECT OF IMPLEMENTATION OF BARCODED MEDICATION ADMINISTRATION ON THE INCIDENCE OF MEDICATION ADMINISTRATION ERRORS
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Ian Ford, PharmD
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Presenting on Tuesday, May 14 at 9:00 AM in Palm II

Introduction:
A bar-coded medication administration (BCMA) system was implemented at the University of Utah Hospitals and Clinics (UUHC) in February 2013. The goal was to provide an additional level of patient protection by reducing the incidence of medication administration errors. An electronic medication administration record (eMAR) and computerized provider order entry system were already in place. Because UUHC’s voluntary error reporting system potentially underestimates the medication administration error rate, a more accurate data collection method is necessary to truly assess the effects of BCMA. The objective of this study is to evaluate the incidence of medication administration errors before and after implementation of the BCMA system in the UUHC acute care environments.

Method:
Data were collected via direct observation of medication administrations by nursing staff. Observers did not have access to the patient’s chart or medication record during observations and did not know if the events recorded represent errors. Objective information about the actual medications given to the patient were collected, including time of administration, drug, strength, dosage form, quantity, and route. Errors were only identified after a retrospective comparison of the collected data was made to the order information in the patient’s eMAR. Data were collected in five patient care areas that represent a cross section of UUHC acute care environments. There were two data collection periods: one before and one several weeks after implementation. The primary outcome was change in medication administration error rate following the implementation of BCMA.

Results and Conclusion:
Results will be presented after final review and evaluation of collected data.
ACPE #:0126-9999-13-159-L01-P
Learning Objectives:

- Explain the findings of a comprehensive chart review of suspected hepatitis C positive patients for one service unit serving the American Indian/Alaska Native patient population.

Introduction
The Centers for Disease Control and Prevention (CDC) recognizes that roughly 85% of the four million Americans infected with HCV are undiagnosed. Individuals born during the years 1945-1965 account for more than 75% of those infected. HCV is a major contributor to chronic liver disease among AI/AN with rates at least twice that of Caucasians. The objectives of this study are to identify all AI/AN infected with HCV, implement the 2012 CDC recommendation of screening for adults born from 1945-1965, and report all previously undiagnosed patients in the Santa Fe Service Unit.

Methodology
After review by officials of the service unit, it was determined that complete IRB review and approval would not be needed for this project. A search will be conducted utilizing multiple sources of data to include internal and external reporting. The data will comprise all known HCV patients within the service unit who were screened based on current practice prior to the 2012 CDC age-based screening recommendation. A new hospital policy following the CDCs Recommendations for Identification of Chronic Hepatitis C Virus Infection Among Persons Born during 1945-1965 will be implemented to augment previous CDC recommendations of HCV risk-based screening. In-service and education to physicians, mid-level providers, pharmacists, and nurses will be provided to increase awareness of the universal age-based screening recommendation. Prominent reminders built into EHR will prompt providers to order appropriate laboratory HCV screenings during routine visits to include asymptomatic adults when indicated. Reports linked to these new HCV screening reminders will be periodically reviewed to assess the impact of implementation of this policy and to provide a clearer picture of HCV prevalence in the AI/AN population.
Explain the impact of implementing universal age-based screening protocol for hepatitis C in addition to established risk based screening.


150 - EVALUATION OF DOSING IN OVERWEIGHT AND OBESE PEDIATRIC PATIENTS IN THE EMERGENCY DEPARTMENT
B6. Pediatric or Gender Specific Care

Presented by:

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Presenting on Tuesday, May 14 at 2:00 PM in Sunset II

Introduction:
Rates of obesity in pediatric patients have increased over the years, complicating the ever present dangers inherent in treating these patients in the health care setting. According to the National Health and Nutrition Examination Survey (NHANES) in 2007-2008 31.9% of children and adolescents were overweight and 16.3% were obese. Some studies estimate that up to 20% of inpatients aged 2-20 years may be obese. The body composition of the obese pediatric patient is often heavily weighted toward fat-mass when compared to obese adults, combined with cytochrome P450 activity alterations documented in this population, errors in drug therapy may be amplified, particularly in the fast paced environment of the emergency department. Previous studies have investigated dosing errors and pharmacokinetic trends in overweight/obese children admitted to an inpatient unit, most of which have involved either antimicrobials or opioid analgesics. The primary objective of the current study is to investigate the rates of dosing errors of all medications used in obese pediatric patients treated in the emergency department, an environment not previously well studied, and compare them with matched, normal weight counterparts. Secondary endpoints will focus on the success or failure of analgesic and antimicrobial therapy when these errors occur (under/over-dosing) and factors associated with these errors. Results from this study will help this and other institutions determine if there is a need for more structure to the practice of dosing medications in obese and overweight pediatric patients.

Methodology:
This study will be a retrospective, descriptive case - control study. This project will involve a retrospective chart review of both non-obese and overweight/obese pediatric patients (2-17 years old) treated in the emergency department between 6/30/2009 to 6/30/2012. A total of 126 patients will be selected for each of the two groups based on Cohen power analysis. Normal weight patients will be defined as those with body mass indexes (BMIs) between the 25th through 75th percentile based on CDC growth charts and those in the overweight/obese group will be patients with BMIs above the 85th percentile. Equivalent numbers of patients for each group will be selected for each six month block of time to ensure minimal bias based on changing prescribing trends over time with subjects from the overweight/obese group being screened first. Patients for the normal weight group will then be selected in a manner to match by sex as well as height and age (within 10%) of the selected individuals from the first group. Acceptable dosing ranges will be determined with two resources, Micromedex™ and the Pediatric Dosing Handbook. Dosing errors include any dose by weight greater than10% outside of the documented dosing guidelines. We will also attempt to investigate the rates of pain relief success/failure by pre/post pain scores as well as antibiotic success/failure based on culture clearance,
clinical improvement, and therapeutic drug monitoring records. Descriptive and inferential statistical analyses will be completed with STATA version 11.1 software with a-priori of 0.05. Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-160-L01-P

Learning Objectives:
- Identify medications with the most potential for dosing errors in overweight/obese pediatric patients in the emergency department.
- List options for safe dosing practices in caring for overweight and obese pediatric patients treated in the emergency department.


151 - HOSPITAL READMISSIONS IN MANAGED CARE PATIENTS: POTENTIAL PHARMACISTS INTERVENTIONS AT A LARGE ACADEMIC MEDICAL CENTER

B4. General Clinical Practice

Presented by:

Meghan Frear, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Royal III

Introduction:
Patients experience an increased risk of adverse events during transitions of care. Literature shows that up to 49% of adults will experience an adverse event after hospital discharge. Of these, 19-23% of events are considered adverse medication related events, with nearly half of these being preventable or potentially mitigated to less severe outcomes. Effective planning and coordination of care may contribute to higher patient satisfaction, reduced adverse events, reduced hospital readmissions across many disease states, and reduced cost of health care.

In the setting of health care reform and an increased need to work efficiently within the health care system, the ability to reduce hospital readmissions is important. As medication use experts, pharmacists have the potential to reduce the number of preventable and medication related hospital readmissions. The objectives of this study are to determine the proportion of pharmacist preventable hospital readmissions in managed care patients and to identify focus areas for pharmacist interventions.

Methods:
This single-center, retrospective, non-blinded chart review examined unplanned hospital readmissions within 30 days of discharge for managed care patients within the University of California Davis Medical Center (UCDMC). After completion of chart review for admission and readmission reasons, determination of a pharmacist’s potential to prevent readmission was reached through consensus of study investigators.

Results:
From July 1, 2012 through December 31, 2012 there were 45 unplanned readmissions of managed care patients within 30 days of hospital discharge. Twenty-five unique patients (9 men, 16 women) ranging in age from 18 to 76 were identified in these readmissions. The number of readmissions per unique patient ranged from one to nine within the six-month study period, with two patients accounting for 17 (37.8%) of these readmissions. Of
the 45 hospital readmissions, nine (15.5%) were deemed potentially preventable through pharmacists provided services.

Conclusion:
Hospital readmissions remain an important indicator used to report on the quality of care provided by hospitals nation-wide. The study of the potential impact of pharmacists on these readmissions remains challenging. While potential pharmacist interventions were identified in nine of 45 readmissions for a six-month period, the study population size is too small to draw statistically significant conclusions. Future studies should include larger sample sizes to allow testing for statistically significant areas of pharmacist intervention. These studies should seek to determine the proportion of pharmacist-preventable readmissions, and to classify the specific pharmacist activities that may be useful in preventing these readmissions. New studies may also seek to determine the potential for pharmacist interventions in non-managed care patients and identify significant differences between these populations.

ACPE #:0126-9999-13-161-L01-P
Learning Objectives:
   Describe four benefits of having a pharmacist involved in discharge planning and care coordination.
   List two areas identified by this study that pharmacist interventions could possibly prevent hospital admissions.


152 - IMPLEMENTATION OF CLINICAL PHARMACY SERVICES IN A LEVEL II A NEONATAL INTENSIVE CARE UNIT
B6. Pediatric or Gender Specific Care

Presented by:
Stephanie Friedman, PharmD
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Presenting on Tuesday, May 14 at 2:30 PM in Sunset II

Neonatal patients are among the most vulnerable in the hospital, and they are at a particularly high risk of poor outcome in the event of a medication error. Few medications have been rigorously tested in clinical trials on that age group; even fewer drugs are commercially available at neonatal concentrations, requiring complex dilutions of adult medications to achieve the desired doses. Additionally, management of medications in the neonate presents a complex challenge for clinicians due to maturity-related fluxes in weight, kidney function, respiratory function, and metabolism. These factors all increase the risk of medication errors in the NICU. The use of pharmacists specially trained in neonatal medicine has been shown to decrease NICU medication errors. A 2004 study demonstrated that the introduction of a neonatal pharmacy specialist to daily NICU rounds, coupled with pharmacy-provided training of NICU staff, led to a 78% decrease in medication errors after four months.

St. Joseph Medical Center (SJMC) is a 366-bed regional medical center which delivers nearly 4,000 babies per year, ten percent of which require NICU services. In April 2013, SJMC will open a new 23-bed, Level IIIA NICU to serve a higher acuity of neonate than previously served by our Level II special care nursery. Under the existing system, orders for neonates are reviewed and entered by central pharmacy staff, and communication with neonatal nursing and medical providers is conducted by phone on an as-needed basis.
This pilot program will introduce a neonatal pharmacy specialist to the NICU to provide prospective medication therapy recommendations through participation in staff rounding and provision of drug information. Additionally, the program will include the development of combination neonatal/maternal training materials for non-specialist pharmacy support staff, designation of a neonatal-specific area of the IV admixture room for increased medication safety, and the revision of the drug formulary and IV pump library to accommodate neonatal requirements.

Measurement of NICU staff satisfaction with pharmacy services will be conducted via survey in the week prior to the launch of the pilot on April 1, to be compared with another survey two weeks after launch. Additionally, all pharmaceutical interventions made by the neonatal specialist for those two weeks will be reviewed against historic data of medication errors from a similar timeframe. Results and conclusions will be presented.

ACPE #:0126-9999-13-162-L01-P

Learning Objectives:
- Describe benefits of the introduction of a clinical pharmacist to the NICU.
- Analyze the workflow of the neonatal pharmacy specialist as implemented at SJMC.


153 - ANALYSIS OF COMMUNITY-ORIENTED RESISTANCE PATTERNS OF URINARY TRACT INFECTIONS AT AN ACADEMIC EMERGENCY DEPARTMENT

A1. Infectious Disease - Anti-infective Agents

Presented by:

Kelly Fritz, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Garden

Introduction: Urinary tract infections (UTIs) are one of the most prevalent infections in the United States. It is estimated about 8 million office visits per year are due to UTIs which correlates to about 1.5 billion USD per year. Emergency Department (ED) visits account for about 1 million of those visits. Women are at the highest risk for developing a UTI and about one-third of women will have had a UTI by the age of 24.

E. coli resistance has been documented across the United States attributable to increased use of antibiotics such as nitrofurantoin, sulfamethoxazole/trimethoprim, or fluoroquinolones. It is becoming increasingly difficult to prescribe an appropriate empiric regimen due to these resistance patterns. Antibiograms can help clinicians in the inpatient setting, but for ED physicians, hospital-based resistance patterns cannot describe community-acquired infections. There is currently no antibiogram specific for community-acquired uropathogens at the University of Utah Emergency Department.

Methods: The primary objective of this project was to create a community-based, ED-specific antibiogram of uncomplicated UTIs at the University of Utah Emergency Department. Patients with a positive urine culture over the last year (October 2011-Sept 2012) were identified using an electronic charting system. Inclusion and exclusion criteria identified patients for final analysis. Microbiologic data were compiled from a data warehouse using descriptive statistics to make an antibiogram. Epidemiologic data was pulled for each patient to describe the community population associated with this antibiogram.

Results: Final results are pending full review.
Conclusion: Having an accurate pattern of resistance for common uropathogens in the geographic area will provide ED physicians with a tool to aid in choosing appropriate empiric therapy for patients diagnosed with a UTI or pyelonephritis.

ACPE #:0126-9999-13-163-L01-P
Learning Objectives:
1. Describe two benefits of an emergency department-specific antibiogram.
2. Explain the differences between IDSA treatment guideline recommendations for urinary tract infections and asymptomatic bacteriuria.


154 - AN INTERDISCIPLINARY APPROACH TO ACHIEVE EARLY MOBILITY THROUGH MINIMIZING LEVEL OF SEDATION IN VENTILATED PATIENTS
B3. Critical Care

Presented by:
Ailynne Fruto, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Executive 713

AN INTERDISCIPLINARY APPROACH TO ACHIEVE EARLY MOBILITY THROUGH MINIMIZING LEVEL OF SEDATION IN VENTILATED PATIENTS
Kimberly Tallian, PharmD, BCPP, FASHP, FCCP, FCSHP – Principal Investigator
Kim Dang, PharmD, BCPS – Sub-Investigator
Ailynne Fruto, PharmD, PGY-1 Pharmacy Resident – Sub-Investigator

INTRODUCTION  Prolonged, deep sedation in adult mechanically ventilated ICU patients has been associated with increased mortality, delirium, and possibly long-term neuropsychological dysfunction. Studies have demonstrated improved outcomes with lighter levels of sedation, including shortened duration of mechanical ventilation and ICU length of stay. Although institutions have developed evidence-based sedation protocols to minimize sedative use, compliance remains low. The ABCDE bundle and the 2012 Pain, Agitation, and Delirium (PAD) guidelines recommend using an interdisciplinary approach to successfully implement sedation protocols and guidelines into practice. Moreover, recent studies have demonstrated the positive impact of direct pharmacist involvement in facilitating adherence with sedation guidelines. A multidisciplinary program consisting of a pharmacist and nurse will be piloted at Scripps Memorial Hospital La Jolla to optimize sedation management and to help facilitate progress toward early mobilization.

METHODOLOGY  A two-phase, single-center study conducted at Scripps Memorial Hospital La Jolla will collect data in 200 patients admitted to the ICU under mechanical ventilation pre- and post-implementation of an early mobilization team. The first phase will consist of retrospectively collecting control data on current sedation practice in 100 patients mechanically ventilated in the ICU between July 2012 and December 2012. Subsequently, the second phase will involve a pilot program consisting of a pharmacist and a nurse making twice daily rounds on 100 patients ventilated between July 2013 and December 2013. A nurse and pharmacist will make assessments as well as provide recommendations to ensure current practice complies with evidence-based guidelines. Patients eligible for inclusion are mechanically ventilated patients in the ICU for at least 48 hours and receiving continuous or intermittent intravenous sedative and/or analgesic drugs. Exclusion criteria...
include patients less than 18 years and contraindications to early mobilization (unstable spinal cord injury, unstable intracranial pressures, femoral lines, decline in respiratory status, hemodynamically unstable, DVT without IVC filter, and palliative care). Data will be collected on baseline characteristics, sedation goals, patterns of analgesic and sedative use, sedation depths, duration of mechanical ventilation, and length of stay.

RESULTS AND CONCLUSIONS  Results of the first phase of this study will be presented.

ACPE #:0126-9999-13-164-L01-P
Learning Objectives:
  Describe current sedation practice at Scripps Memorial Hospital La Jolla.
  Describe the outcomes of an interdisciplinary team's efforts to optimize sedation management.


155 - VANCOMYCIN CLEARANCE IN END-STAGE RENAL DISEASE PATIENTS ON HIGH-FLUX HEMODIALYSIS
B7. Pharmacokinetics

Presented by:
Ashley Fuchigami, PharmD
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Presenting on Tuesday, May 14 at 8:00 AM in Sunset III

Background: Vancomycin, a bactericidal glycopeptide antibiotic, has been widely prescribed for serious gram-positive infections and methicillin-resistant Staphylococcus aureus (MRSA). Half-life elimination of vancomycin in adults with normal kidney function can range from 6-12 hours, whereas the half-life elimination in patients with end-stage renal disease (ESRD) can be as long as 100-200 hours. Conventional hemodialysis membranes poorly remove vancomycin due to large molecular weight, thus allowing for longer dosing intervals. However, higher permeability (high-flux) membranes are capable of clearing 30-46% of vancomycin. Several studies have attempted to address the issue of appropriately dosing vancomycin in patients receiving high-flux hemodialysis, but variability among dialyzers have precluded the development of a standardized vancomycin dosing protocol sufficient to safely maintain target levels.

Methods: This was a prospective, single-centered study of adult chronic hemodialysis patients receiving intravenous vancomycin from November 2012 until March 2013. This project has been deemed a quality improvement measure and was thus exempt from approval by the Institutional Review Board. Patients were included into the study if they were 18 years of age or older, required chronic intermittent hemodialysis three times weekly, completed at least one dialysis session for 3-5 hours while receiving vancomycin, and had established end stage renal failure for at least two years. Vancomycin levels were obtained with morning labs on the day of scheduled dialysis and 4 hours after dialysis on a single event. The primary objective is to evaluate vancomycin clearance in ESRD patients on high-flux intermittent hemodialysis at Alameda County Medical Center. The secondary objective is to establish a pre-dialysis vancomycin level sufficient to maintain therapeutic levels throughout the intermittent hemodialysis process.

Results and Conclusions: The findings of this study will be presented after completion.

ACPE #:0126-9999-13-165-L01-P
Learning Objectives:
Describe the extent and variability of vancomycin clearance through high-flux hemodialyzers
Describe an appropriate therapeutic drug monitoring plan for a patient on intermittent hemodialysis receiving vancomycin


156 - EVALUATION OF THE CLINICAL OUTCOMES OF ALVIMOPAN IN BOWEL RESECTION SURGERIES AT A LARGE COMMUNITY HOSPITAL
A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

Akina Fujioka, PharmD
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Presenting on Tuesday, May 14 at 9:00 AM in Mission Bay Foyer

Background: In 2008, alvimopan (Entereg®) became the first FDA approved drug indicated for the acceleration of recovery after bowel resection with primary anastomosis. It is a novel mu opioid receptor antagonist that acts specifically on peripheral receptors outside the central nervous system. Clinical trials demonstrated that alvimopan significantly reduces post-operative morbidity and hospital length of stay.

Objectives: The primary objective of this study is to determine the difference in post-surgical hospital length of stay between patients who received alvimopan versus those who did not. Secondary objectives are to compare time to first bowel movement, rate of nasogastric tube re-insertion, and rate of need for total parenteral nutrition between patients who received alvimopan and those who did not.

Methods: The study is an investigator-initiated, single center, retrospective cohort study conducted through medical chart review to evaluate the use of alvimopan at Long Beach Memorial from July 2008 – present. The alvimopan group will be identified by generating a list of patients who received alvimopan at Long Beach Memorial Medical Center. The control group will be identified by generating a list of patients who underwent small intestine, colon, and rectal surgeries that did not receive alvimopan. For each group, data will be collected on patient demographics, concurrent diseases, surgery types, hospitalization course, and clinical outcomes.

Statistical Analysis:
Power analysis was conducted using previous studies to estimate the number of subjects needed to detect a difference in post-surgical length of stay between the drug and placebo control groups. Descriptive statistics will be used to present patient demographics, concurrent diseases, surgery types, hospitalization course, and clinical outcomes. Furthermore, a univariate analysis will be conducted to identify factors that affect the primary objective, post-surgical length of stay. The significant factors will then be used in a multivariate analysis. Adjusted difference in post-surgical length of stay between the alvimopan and control group will be reported.

Results: To be presented.

ACPE #:0126-9999-13-166-L01-P
Learning Objectives:

List the criteria patients must meet to be eligible for alvimopan.
Describe the role of alvimopan in improving the post-operative course of patients undergoing bowel resection surgeries.
157 - IMPACT OF A FORMULARY SWITCH FROM GLARGINE TO DETEMIR INSULIN
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:
RaeAnne Fuller, PharmD
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Presenting on Tuesday, May 14 at 4:30 PM in Mission Bay Foyer

Introduction: In 2011, the Phoenix Indian Medical Center (PIMC) made a formulary switch from insulin glargine to insulin detemir for patients with type 2 diabetes mellitus (DM). The objective of this project was to assess the use, efficacy, and safety of switching long-acting insulin products in patients at PIMC.

Methodology: The Institutional Review Board exempted this retrospective chart review project. Patients with prescriptions for both glargine and detemir insulins were identified and reviewed through the facility’s electronic medical record system. Data was recorded without patient identifiers and maintained confidentially. The inclusion criteria consisted of patients with type 2 diabetes prescribed glargine insulin for at least 6 months, then subsequently converted to detemir insulin. Exclusion criteria were patients less than 18 years of age, pregnancy, lack of follow-up within one year of switching insulins, discontinuation of detemir before 3 months of treatment, or absence of a glycosylated hemoglobin (HbA1c) value while on glargine or after changing to detemir. Data collected includes: gender, age, weight, body mass index, HbA1c, concomitant anti-diabetic medications, insulin schedules and doses, adverse reactions, discontinuation of detemir, and reason for discontinuation.

The primary efficacy outcome was a comparison of the HbA1c values for patients on glargine versus detemir insulins. The secondary efficacy outcome was a comparison of the proportion of patients achieving optimal glycemic control (HbA1c < 7%) on glargine versus detemir. The total daily dose and dosing frequency for glargine versus detemir was evaluated. Safety assessment included the incidence of hypoglycemic events, body weight changes, adverse reactions, and occurrences of switching from detemir to another insulin. Data was analyzed to evaluate for any statistically significant differences. Finally, expenditures for all insulins were compared before and after the change.

Results and Conclusion: The findings of this study will be presented.

ACPE #:0126-9999-13-167-L01-P
Learning Objectives:
   Describe the cost difference, efficacy, and safety from switching from glargine to detemir insulins at PIMC.
   Describe the differences in potency and dosing between insulins glargine and detemir.

158 - EVALUATION OF GLYCEMIC CONTROL WITH A PHARMACIST-MANAGED POST-CARDIOTHORACIC SURGERY INSULIN PROTOCOL
B3. Critical Care
Presented by:

**Andrew Fung, PharmD**
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**Presenting on Tuesday, May 14 at 10:00 AM in Executive 713**

**INTRODUCTION:**
Surgical site infections pose a major complication to cardiothoracic surgery and can result in longer hospital stays, wasted medical resources, significant discomfort, and even mortality. The risk of infection is nearly doubled in patients with post-operative hyperglycemia compared to euglycemic patients, highlighting the importance of establishing consistently effective practices that ensure optimal glycemic control. At Kaiser Permanente San Francisco Medical Center, the Post-Cardiothoracic Surgery Insulin Monitoring Per Pharmacy Protocol will be implemented to improve insulin therapy by creating a standardized level of care which outlines when to monitor blood glucose levels, which insulin sliding scale doses are to be used, and how to initiate scheduled insulin following surgery. The purpose of this study is to validate whether this standardized pharmacist-managed protocol will improve glycemic control in cardiothoracic post-operative patients, while reducing the incidence of hypoglycemia, post-operative infections, and length of hospital stay.

**METHODOLOGY:** The study will be conducted via retrospective chart review and will compare the outcomes from patients treated before and after implementation of the protocol. The primary efficacy outcome is defined as the percentage of patients below the target blood glucose level of 200 mg/dL from post-operative day 1 through post-operative day 2, with secondary outcomes comparing the rates of hypoglycemia, length of hospital stay, and the incidences of surgical-site infections at 30 days post-surgery. Eligible participants will include all adult patients who have undergone cardiothoracic surgery and require insulin management as defined under the protocol (See protocol for details). Data of primary and secondary outcomes data will be analyzed via Chi-Squared Test. The study will be conducted from August 2012 to May 2013.

**RESULTS AND CONCLUSIONS:** This will be presented at the Western States Residency Conference.

ACPE #:0126-9999-13-168-L01-P

Learning Objectives:

- Explain the importance of glycemic control in patients who have undergone cardiothoracic surgery and the complications associated with post-operative hyperglycemia.
- Describe the impact of a pharmacist-managed insulin monitoring protocol in the cardiothoracic post-operative setting.


**159 - ACCURACY OF HEPARIN WEIGHT-BASED DOSING IN OBESE PATIENTS**

B4. General Clinical Practice

Presented by:

**Po Fung, PharmD**
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**Presenting on Tuesday, May 14 at 11:30 AM in Royal III**
Background: According to the Centers for Disease Control and Prevention, more than one-third (37.5%) of U.S. adults are obese. Among obesity-associated conditions such as acute coronary syndrome (ACS), stroke, and venous thromboembolism (VTE), the prevalence of obesity have impacted dosing strategies for many medications, particularly unfractionated heparin. Despite over 50 years of clinical experience, dosing of unfractionated heparin in obese patients still remains unclear. Although the American College of Chest Physicians’ (ACCP) guidelines supports the use of a weight-based strategy of heparin, it does not specify the weight to be used or a maximum bolus and infusion rate. Many studies have attempted to identify the most optimal dosing strategy but there is a lack of consensus, especially in regards to obese patients. Additionally the classification of obesity is not well defined and differs from various hospitals and pharmacy departments.

Objectives: The primary objective of this study is to evaluate the safety and efficacy of the heparin weight-based dosing protocol, particularly in the obese population. This study also aims to identify which strategy in defining obesity, either based on percent body weight or body mass index, would provide the most optimal dosing of heparin.

Methods: A retrospective chart review of all patients who received unfractionated heparin per protocol over a 24-month period from January 2011 to December 2012 will be conducted. Patients are excluded from the study if: dosing protocol was violated for any reason or heparin was discontinued before a PTT could be attained. Efficacy endpoints include initial bolus dose and infusion rate, infusion rate that produced the first therapeutic PTT, and time to achieve two-consecutive therapeutic PTT.

Results: Data is currently being analyzed and the results will be provided upon completion of the study.

Conclusions: The study will serve to guide practitioners in the management of heparin in obese patients.

ACPE #:0126-9999-13-169-L01-P

Learning Objectives:
- Describe an optimal dosing strategy for heparin among the obese population.
- Identify the ideal definition for obesity in the setting of heparin dosing.


160 - ALIGNMENT OF CLINICAL PHARMACY SERVICES WITH PATIENT-CENTERED MEDICAL HOME STANDARDS IN A SAFETY NET ORGANIZATION

B1. Ambulatory Care

Presented by:

Oscar Gallegos, PharmD
Universitiy of Southern California School of Pharmacy
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Presenting on Tuesday, May 14 at 5:00 PM in Executive 713

Alignment of Clinical Pharmacy Services with Patient-Centered Medical Home Standards in a Safety Net Organization

Background: The Patient Centered Medical Home (PCMH) was developed to help improve the quality of primary care. The National Committee for Quality Assurance (NCQA) PCMH standards, which include organizing care around patients, working in teams, and coordinating and tracking care over time, are very similar to the framework that clinical pharmacy services (CPS) have been delivered in for decades. The integration of CPS into PCMHs provides essential medication-related services that optimize health outcomes and medication safety.
However, few studies or reports have described the alignment of clinical pharmacy services with PCMH standards and goals.

Methods: This study will analyze a CPS for a multiple site safety net organization that has attained NCQA PCMH recognition. Alignment of CPS with the 6 PCMH standards (enhanced access and continuity, identification and management of high-risk patient populations, planned and managed care, provision of self-care support and resources, tracking and coordinating care, measurement and performance improvement) will be described along with specific examples. The clinical pharmacists’ direct patient care through individual appointments with patients that are not at goal for a variety of chronic disease role is to identify patients at high-risk for medication therapy failure or an adverse drug event. These patients are identified through information technology queries that combine key demographic, problem list, medication, lab, vital sign, acute care utilization, and other data elements that reflect a potential gap in the quality or safety of care. Patients are scheduled for a clinical pharmacist evaluation, during which all medication-related problems such as side effects, duplicate medications, suboptimal therapy, and barriers to adherence are identified, resolved, and documented using a categorization system developed by the University of Southern California School of Pharmacy and adopted by the Health Resources and Services Administration (HRSA) Patient Safety and Clinical Pharmacy Services Collaborative. Adjustments to medication therapy are implemented according to approved protocols, based on national guidelines and current literature evidence. The clinical pharmacists also make recommendations for lifestyle changes that are key to controlling chronic illnesses such as nutrition and exercise. Monitoring and follow-up care is provided until treatment targets are reached. All care and outcome measures are documented in the safety net organization EHR. A pretest-posttest comparison of health quality measures aligned with national standards will be conducted using either the appropriate statistical test (Student T-test, Mann Whitney U test, and/or McNemar’s test).

Results and Conclusion: To be presented

ACPE #:0126-9999-13-170-L01-P

Learning Objectives:
1. Describe the alignment of clinical pharmacy services with PCMH standards.
2. Explain the clinical pharmacist’s impact on healthcare quality and medication safety in an NCQA-recognized safety net PCMH.


161 - FOOD FOR THOUGHT: HOME INFUSION PHARMACIST INTERVENTION PROCESS TO REDUCE THE INAPPROPRIATE USE OF PARENTERAL NUTRITION

A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

Karen Gana, PharmD
Kaiser Permanente, Anaheim, CA
karen.gana@kp.org

Presenting on Tuesday, May 14 at 9:30 AM in Mission Bay Foyer

Parenteral nutrition provides nutritional requirements intravenously and is essential for patients who cannot meet their daily nutritional needs through oral intake or enteral tube feedings. Although parenteral nutrition can provide life-saving nutrition and improve patient outcomes when used appropriately, it can also be associated with complications such as catheter-related infections, metabolic abnormalities and hepatobiliary
-acp#:0126-9999-13-171-l01-p

learning objectives:

describe the impact of a pharmacist intervention process to reduce inappropriate parenteral nutrition utilization in patients serviced by the kaiser permanente orange county home infusion pharmacy.
list two current guidelines used in the study to help promote the appropriate use of parenteral nutrition.


162 - incidence, risk factors, and treatment of venous thromboembolism in cancer patients: a retrospective review

b1. ambulatory care

presented by:

emily garispe, pharmd
loma linda university
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presenting on tuesday, may 14 at 4:30 pm in executive 713

introduction:
the purpose of this study is to determine the incidence and risk factors for venous thromboembolism (vte) in cancer patients at the loma linda university adult cancer center (lluacc), as well as to review the presence or lack of appropriate anticoagulation therapy in this population. it is well established that vte is a major cause of morbidity and mortality in patients with cancer. vte complications can delay important treatment and increase the number of patient hospitalizations. early recognition and appropriate prophylaxis in patients that are at increased risk for vte events can potentially decrease unnecessary healthcare costs and improve patient outcomes. guidelines and recommendations for the inpatient treatment of vte in cancer are established; however, outpatient management guidelines are currently lacking.
Methods:
Retrospective data will be collected from existing electronic medical records and LLUACC Pharmacy patient charts for 400 patients treated between January 2010 and December 2012. Data will be collected in order to determine the incidence, risk factors, and treatment of venous thromboembolism in the LLUACC. Appropriate statistical analysis will be used to determine the significance of the results.

Results and Conclusion:
To be presented upon completion.

ACPE #:0126-9999-13-172-L01-P
Learning Objectives:
- Explain the current indications for anticoagulation in the adult cancer patient.
- Identify which malignancies carry a higher risk of venous thromboembolism.


163 - USE OF CALCIUM AND MAGNESIUM TO REDUCE THE INCIDENCE AND SEVERITY OF OXALIPLATIN-INDUCED NEUROTOXICITY
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Davina Garls, PharmD
Kaiser Permanente Fontana
davina.lynn.garls@kp.org

Presenting on Tuesday, May 14 at 9:00 AM in Sunset I

Introduction: Sensory neurotoxicity is a dose-limiting toxicity of oxaliplatin, and can cause a delay in treatment, a decrease in dose, or discontinuation of therapy, potentially compromising treatment for patients. Neurotoxicity associated with oxaliplatin may be due to an effect of its metabolite, oxalate, on voltage-gated sodium channels. Calcium and magnesium serve as oxalate chelators, and can be used before and after oxaliplatin infusions to prevent neuropathy. However, the use of calcium and magnesium remains controversial. This study aims to evaluate the use of calcium and magnesium infusions to reduce the incidence and severity of oxaliplatin-induced neurotoxicity.

Methods: Using Kaiser Permanente electronic medical records, a retrospective chart review of 13 medical centers was conducted from January 2011 through March 2013. Patients were included if they received oxaliplatin-based therapy for colorectal cancer and were 18 years of age or older at time of administration. Patients who did not receive a minimum of three cycles of oxaliplatin, those with known peripheral neuropathy, or patients in which neuropathy was not assessed were excluded. Patients who received oxaliplatin without prophylactic calcium and magnesium treatment were compared to those who received calcium gluconate and magnesium sulfate infusions before and after oxaliplatin treatment. The primary endpoint, grade of neuropathy, was determined using the National Cancer Institute-Common Toxicity Criteria version 4.0., and was assessed using a Mann-Whitney Rank Sum test. Delays in therapy, dose reductions, or discontinuations of therapy due to neuropathy were also compared between groups.

Results & Conclusion: To be presented

ACPE #:0126-9999-13-173-L01-P
Learning Objectives:
Explain the current controversy regarding the use of calcium and magnesium infusions to prevent oxaliplatin-induced neuropathy.
Describe the potential for calcium and magnesium infusions to reduce the incidence and severity of oxaliplatin-induced neurotoxicity, as found in the present study.


164 - ESTABLISHING THE ROLE OF AN EMERGENCY ROOM PHARMACIST AND JUSTIFYING THEIR USE IN A SMALL HOSPITAL SETTING

B4. General Clinical Practice

Presented by:

Neil Garver, PharmD
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Presenting on Tuesday, May 14 at 2:00 PM in Royal III

Introduction: Pharmacists have been proven to improve medical care when on-site in critical care units, medical floors, and in the emergency department. Emergency departments have the highest rate of preventable ADEs in hospitals, driven by the number of patients seen and the urgency to provide care. Large emergency departments care for a greater volume of patients in a frequently chaotic environment, creating a situation more prone to error. Due to resources and volume of patient visits in a smaller hospital setting, it may be more difficult to justify dedicated pharmacist hours in the emergency department when compared to larger institutions.

Bozeman Deaconess Hospital is an 86-bed facility that currently provides about 4 hours of pharmacist coverage in the emergency room, a 20-bed, level III trauma center. Currently, services provided by the pharmacist primarily revolve around medication reconciliation. On-site hours covered by the pharmacist do not include the time frame that historically tends to a larger volume of patients. Previous studies utilizing an on-site pharmacist have shown a decrease in medical errors, improvement in continuity of care, and better care provided to patients. Activities delegated to an on-site pharmacist in a small emergency room will decrease medical errors, increase error reporting, improve core measure compliance, and provide continuity of care.

Methods: Historical data regarding medication errors in the Bozeman Deaconess Emergency Department was collected and quantified, after the implementation of a new electronic medical program, via retrospective chart review. Medication errors were defined as unordered medication given, ordered medication not given, wrong drug given, wrong dose given, incorrect administration, high alert medication administered without a smart pump infusion set, error related to patient information, and indicated medication not given. Reported errors and information concerning core measure compliance were collected through the quality department within the hospital. A short one week observational period was completed to assess the use of high alert medications. Appropriate use was defined as following hospital policies and procedures for each high alert medication. The intervention phase was a month long in duration from January to February 2013, and entailed the pharmacy resident being present on-site in the emergency room during the hours that historically encountered the highest volume of patients. Responsibilities delegated to the pharmacy resident included providing clinical pharmacy services in addition to completing medication reconciliations. Data concerning medication errors, error reporting, and core measure compliance was collected and analyzed. Previously undefined pharmacy services provided were also recorded and analyzed. Feasibility of creating an emergency department pharmacist position at Bozeman Deaconess Hospital was evaluated.

Results and conclusions will be discussed.
Learning Objectives:
Describe services that could be provided by having a dedicated emergency room pharmacist in a small community hospital setting.
Explain the potential patient and cost benefits associated with providing dedicated pharmacy services in the emergency department.


THE IMPACT OF A DECENTRALIZED ICU PHARMACIST IN A MILITARY TREATMENT FACILITY
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Andrew Gawlikowski, PharmD
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Presenting on Wednesday, May 15 at 10:00 AM in Sunset III

The Impact of a Decentralized ICU Pharmacist in a Military Treatment Facility
Introduction: Many hospitals currently utilize a Decentralized Pharmacist (DCP) system. Some studies have shown that a DCP is effective in providing enhanced patient care and increased nursing satisfaction, while others have shown it can be a financial burden. However, previous studies that have assessed the value of a DCP only include outcomes data post DCP implementation, with no useful comparator. The purpose of this study is to assess the value of a DCP pre and post-implementation at a military treatment facility.

Methods: Previously at David Grant Medical Center, a critical care pharmacist would round in the Intensive Care Unit (ICU) 2 or 3 days in a 5-day week. We implemented a fully time ICU DCP 5 days a week for 10 hours a day. We utilized a before and after study methodology assessing ICU nursing satisfaction, frequency of central pharmacy contact with the ICU, and the types of interventions made by the ICU DCP. Pharmacy technicians documented the frequency of phone calls from the ICU. All DCP interventions were logged that the pharmacist made. A simple satisfaction survey regarding communication, timeliness of medications, ICU team relations and overall satisfaction was administered to all ICU nurses. All data collection occurred for a period of 30 days prior and 30 days post ICU DCP placement. A student t-test was performed for all continuous variables and a Fisher’s exact or chi-square test used for all categorical data.

Results: Overall the DCP results all showed improvement in workload, pharmacological interventions and ICU nursing satisfaction. The DCP was able to decrease ICU to pharmacy contact work load by 92%, which translates to kyboshing over an hour of phone time per day. There was a fourfold increase in medical interventions made. Finally, the DCP increased nursing satisfaction by 25%, with a perceived increase in nursing patient care time rather than medication management.

Learning Objectives:
1. Describe the effectiveness of a decentralized pharmacist in the ICU.
2. Explain the reasons for using a decentralized pharmacist in a critical care setting

ACPE #:0126-9999-13-175-L04-P
Learning Objectives:
Describe the use and benefit of a decentralized pharmacist in the ICU.
Explain the effect of a decentralized pharmacist in the ICU on nursing satisfaction.


166 - ASSOCIATION OF MEDICATION REGIMEN COMPLEXITY AND MEDICATION ADHERENCE IN POST-DISCHARGE HEART FAILURE PATIENTS
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
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Presenting on Wednesday, May 15 at 2:00 PM in Royal V

Introduction: Heart failure (HF) is the most frequent cause of hospitalization in older patients; up to 50% are readmitted to the hospital within 6 months of discharge. Medication non-adherence is a common cause for readmission and has a strong independent association with poor outcomes in HF patients. Medication regimen complexity is a factor that contributes to medication non-adherence and has been associated with poly-pharmacy and poor outcomes. The medication regimen complexity index (MRCI) tool is a validated tool that systematically quantifies medication regimen complexity based on the number of medications, types of dosage forms, dosing frequency, dietary considerations, and directions for use. The MRCI has been used to describe medication regimen complexity in multiple diseases; however, it has not been described in HF patients. Predicting medication non-adherence using MRCI may allow health care providers to proactively target high-risk patients for focused post-discharge care.

Study Objectives (1) Describe medication regimen complexity in heart failure patients using the MRCI tool. (2) Determine whether MRCI is associated with medication non-adherence 12 months post-discharge. (3) Determine if MRCI scores are associated with hospital readmission 12 months post-discharge.

Methodology: This is a retrospective, cohort study including Veterans Affairs (VA) patients discharged with a diagnosis of HF from October 1st, 2010 to September 31st, 2011. Medication adherence will be measured by calculating the proportion of days covered (PDC) and medication possession ratio (MPR) of refill data from the VA Computerized Patient Record System (CPRS). Medication refill data from pharmacy records will be collected 12 months post index hospital discharge. Refill data will be collected for cardiovascular medications (beta blockers, ACEIs, ARBs, diuretics, digoxin, nitrates, and direct vasodilators). MRCI scores will be collected at the index hospitalization and 12 months post-discharge. Hospitalizations and emergency department visits will be collected 12 months post index hospitalization. Primary analysis will include univariate analysis to test whether MRCI is associated with adherence. Multivariate linear regression and multivariate logistic regression will then be used to determine the independent contribution of the MRCI to the PDC and MPR. Secondary analysis will include multivariate linear/logistic regression analysis using MPR and PDC as continuous and categorical predictors for the outcome, emergency department visits or readmissions.

Results and conclusions will be presented.

ACPE #:0126-9999-13-176-L01-P

Learning Objectives:
- Explain the association of medication adherence, regimen complexity, and re-hospitalization in heart failure patients
Predict medication adherence using the MRCI tool.


167 - EVALUATION OF PHARMACIST INTERVENTION IN HEPATITIS C CARE MANAGEMENT
B1. Ambulatory Care

Presented by:
Katie Gazlay, PharmD
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kgazlay@ucsd.edu

Presenting on Tuesday, May 14 at 8:00 AM in Royal I

Background: Hepatitis C virus (HCV) is the leading cause of chronic liver disease and a major cause of mortality. Treatment has traditionally consisted of combination therapy with peginterferon and ribavirin; however, treatment failure is common and the medications carry several adverse effects often requiring management to avoid treatment discontinuation. A new class of direct acting agents has increased cure rates, but introduced new challenges to the healthcare team, including drug-drug interactions, increased adverse effect management, and adherence. At University of California San Diego Health System (UCSDHS) there was an increase in the number of HCV prescriptions being filled at outside specialty pharmacies. A new specialty pharmacy program, C-Care, was piloted which offers unique services to HCV patients by incorporating specific drug therapy knowledge of a pharmacist and increasing pharmacy involvement in patient care. It includes insurance billing expertise, free home delivery and automated refilling of prescriptions, direct monitoring and management of adverse effects and drug interactions by a pharmacist, multidisciplinary educational support, and direct contact with a pharmacist in clinic. The purpose of this study is to describe the financial and clinical outcomes of UCSD C-Care.

Methods: A retrospective analysis was conducted to describe the results of pharmacist interventions in the clinic and outpatient pharmacy settings for treatment-naïve and treatment-experienced patients with chronic HCV. Patients were included in the study with the following characteristics: ≥18 years old infected with HCV; started HCV therapy between December 3, 2011 and December 31, 2012. Patients who started treatment between December 3, 2011 and March 4, 2012 were in the “Pre-C-Care” group and patients starting treatment on or after March 5, 2012 were in the “C-Care” group. Patients were further divided into either UCSD Outpatient Pharmacy filled prescriptions or non-UCSD pharmacy filled prescriptions. Patients were excluded if they were enrolled in a clinical trial.

Results: Preliminary results indicate UCSD Outpatient Pharmacy made a net profit of roughly $500,000 from HCV prescriptions, with a majority of the net profit occurring after C-Care was established. Furthermore, the percentage of UCSD-treated patients who filled HCV prescriptions at UCSD Outpatient Pharmacy increased from about 28% to 52%. Data collection is ongoing and final results will be presented.

Conclusion: Final conclusion will be presented.

ACPE #:0126-9999-13-177-L01-P
Learning Objectives:
- Describe the financial impact of a hepatitis C specialty pharmacy program.
- List possible pharmacist interventions in the management of hepatitis C.

Introduction: Chemotherapy-induced febrile neutropenia (FN) is a serious hematologic toxicity, which often requires hospitalization. It occurs in about 10-50% of patients diagnosed with solid tumors. For patients with hematologic malignancies who undergo one or more cycles of chemotherapy, 80% will develop FN. Patients with FN should be treated with empiric antibiotics in a timely manner since fever may be the only indication of an underlying infection, which could be fatal if left untreated. Treatment of febrile neutropenia in a hospital can be expensive. A study evaluating the costs of treating patients admitted for chemotherapy-induced FN to a hematology/oncology ward in a tertiary care hospital found a mean overall cost of 6324 ± 4783 Canadian dollars and a mean length of stay of 6.8 ± 4.9 days per episode of FN. One promising way of improving outcomes and reducing costs is through an order set to standardize patient care, which can potentially reduce prescribing errors, ensure appropriate antibiotic coverage, decrease overall antibiotic use and associated laboratory monitoring costs, length of stay and thus overall costs.

Methodology: A retrospective chart review will be conducted for all patients admitted to Community Regional Medical Center’s adult oncology unit with a diagnosis of febrile neutropenia. Data will be collected three months prior and post implementation of the order set. Patients will be excluded if they are pregnant, younger than 18 years, or have a diagnosis of febrile neutropenia not due to cancer. Data collected will consist of patients’ demographics, antibiotics used and associated lab monitoring, temperature, white blood count, bands, absolute neutrophil count, platelets, duration of therapy, and culture and susceptibility results. The efficacy of the order set will be determined by the clinical outcome of either response or failure. Response is defined as the resolution of fever after 3 days of empiric antimicrobial treatment. Failure is defined as either death or unresolved fever that requires modification of the original empiric therapy after 3 days that is not associated with culture and sensitivity results. Prescribers’ compliance will be evaluated by the number of patients receiving evidenced-based treatments pre- and post-order set implementation. Prescribers who do not utilize the order set post-implementation will not be included. The cost-savings will be calculated based on the antibiotics used and associated lab monitoring.

Results and Conclusion: Pre-implementation results include twenty patient charts reviewed, for which eight met inclusion criteria. Based on preliminary results, approximately 50% of patients were prescribed inappropriate empiric antimicrobial therapy. One out of eight patients received inappropriate drug therapy while four out of eight patients received inappropriate dosing. Five out of eight (63%) patients evaluated had resolution of fever. An order set to guide therapy has been developed and is currently in the approval review process. Data analysis will be performed post-implementation of the order set.

ACPE #:0126-9999-13-178-L01-P

Learning Objectives:

- Explain the benefit of implementing a standardized antimicrobial order set for febrile neutropenia.
Describe the cost-savings associated with implementing an antimicrobial order set for febrile neutropenia.


169 - IMPACT OF AN ANTIBIOTIC STEWARDSHIP SERVICE IN THE NEONATAL INTENSIVE CARE UNIT
B6. Pediatric or Gender Specific Care

Presented by:

Sarah Gee, PharmD
Presbyterian/St. Luke's Medical Center and the Rocky Mountain Hospital for Children
sarah.gee@healthonecares.com

Presenting on Wednesday, May 15 at 10:30 AM in Sunset II

INTRODUCTION: Antibiotic prescribing in the neonatal intensive care unit (NICU) is often done with less guidance available than in the adult population. Fewer guidelines exist for hospitalized, high-risk infants, which often results in difficulty choosing appropriate therapies. Antibiotic stewardship programs have been proven to prevent antibiotic resistance, lower yearly drug costs in hospital settings, and improve appropriate prescribing habits. However, there are few published examples of such programs taking place in hospital NICUs. This study examines the impact of a newly initiated antibiotic stewardship program in a level III NICU.

METHODOLOGY: NICU patient charts will be retrospectively reviewed for data pertinent to antimicrobial therapy, including but not limited to, post-menstrual age, post-natal age, gestational age, infection diagnoses, antimicrobial doses and intervals, and microbial cultures. Two reviews will take place: those for patients admitted prior to the initiation of the antimicrobial stewardship service, and those for patients admitted after the new service. Data will be assessed for appropriate antimicrobial selection, appropriate drug monitoring, and antibiotic days of therapy per 1000 patient days.

RESULTS and CONCLUSIONS: Will be presented at the Western States Conference.

ACPE #:0126-9999-13-179-L01-P
Learning Objectives:
1. Explain the potential benefits of a NICU antimicrobial stewardship service.
2. Describe complications in neonates associated with inappropriate antimicrobial therapy.


170 - PAIN CONTROL DURING THE TRANSITION FROM THE INTENSIVE CARE UNIT TO THE GENERAL WARD
B3. Critical Care

Presented by:

Ashlee Gerfen, PharmD
The University of Arizona College of Pharmacy/University of Arizona Medical Center
BACKGROUND: The management of pain is challenging in the critically ill population. Incidence rates of untreated pain in the intensive care unit (ICU) that are procedural or postoperative in nature are estimated above seventy percent. This untreated acute pain may not only have a psychologic burden on patients such as anxiety and fear but also elicit peripheral and central neuronal alterations that evolve into chronic pain conditions. Because of this, it is important to continually measure, compare and improve the quality of pain management. Currently, limited literature exists evaluating pain control in patients transferred out of the ICU. When patients are transitioned from the ICU to the general ward, several logistical and treatment changes occur simultaneously. This includes changes in the number of staff caring for the patient, intensity of care received and changes to pharmacological therapy. This may put patients at risk for an escalation in pain during this transition. The purpose of this study is to evaluate pain control for the surgical and trauma population and identify predictors of poor pain control during the transition period from the ICU to the general medical ward.

METHODS: This prospective study will evaluate adequacy of pain control for surgical and trauma patients during the transition from the surgical and trauma ICU (STICU) to the general medical ward at The University of Arizona Medical Center. The American Pain Society validated survey “Revised American Pain Society Patient Outcome Questionnaire (APS-POQ-R)” will be utilized to assess patient’s pain control during the transition period and a chart review will be performed to identify predictors of poor pain control. The chart review will include demographic information, type of surgery or injury, as well as a summary of medications received for pain and sedation for up to 72 hours of ICU care and up to 24 hours of hospital ward care after transfer from ICU.

RESULTS: To be presented at the Western States Conference in May 2013.

CONCLUSIONS: To be presented at the Western States Conference in May 2013.

ACPE #:0126-9999-13-180-L01-P
Learning Objectives:
- Describe the findings of pain control during the transition from the ICU to the general medical ward.
- List predictors of poor pain control during the transition from the ICU to the general medical ward.

171 - CLINICAL COURSE OF ALCOHOL WITHDRAWAL SYNDROME IN CRITICALLY ILL PATIENTS: PROTOCOLIZED VS NON-PROTOCOLIZED MANAGEMENT

B3. Critical Care

Presented by:
Paricheh Ghayyem, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Executive 713

Alcohol use disorder is a common problem among medically ill patients and affects about 21-42% of admitted patients. Inappropriate management of alcohol withdrawal can lead to complications such as prolonged hospital stays, seizures, and an increased risk for ventilator associated pneumonia.
A novel alcohol withdrawal protocol for ICU patients has been implemented at the UC Davis Medical Center (UCDMC). This new protocol has standardized the treatment of alcohol withdrawal by introducing symptom-triggered dosing of benzodiazepines. The purpose of this retrospective chart review is to describe and analyze the outcomes in protocolized alcohol withdrawal treatment in patients at the UC Davis Medical Center. These outcomes will be compared to alcohol withdrawal patients that were not treated using a protocol.

Patients will be extracted from electronic medical records by searching for those that have utilized the alcohol withdrawal order-set. Patients must also be at least 18 years of age and have a Glasgow Coma Scale > 8 to be included. Study outcomes include time to target RASS, total benzodiazepine requirements, duration of sedation (as measured by RASS), days on ventilator, presence of delirium, ICU length of stay, and need for intubation. Flumazenil use and markers of propylene glycol toxicity (acidosis, renal failure and anion gap >10) will be recorded as indicators of possible drug toxicity. The results of this study will be compared to the results of a prior study completed at UCDMC that evaluated similar outcomes in alcohol withdrawal patients prior to the implementation of the above mentioned protocol.

Results: To be presented.

ACPE #:0126-9999-13-181-L01-P
Learning Objectives:

1. Determine the essential components of an alcohol withdrawal protocol
2. Explain the distinction between selecting diazepam over lorazepam as the preferred benzodiazepine in alcohol withdrawal patients


172 - EVALUATION OF PHARMACIST RECOMMENDATIONS FOR LOW TO INTERMEDIATE STROKE RISK ATRIAL FIBRILLATION PATIENTS ON WARFARIN THERAPY

B1. Ambulatory Care

Presented by:

Kathy Ghomeshi, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Royal I

INTRODUCTION:

Atrial fibrillation can lead to serious thromboembolic events such as stroke. Often times, patients with atrial fibrillation may be placed on anticoagulation therapy for stroke prevention and may remain on therapy for longer than necessary, as risk may change over time. Risk stratification tools (eg, CHADS2 and CHA2DS2-VASc) are available to aid clinicians in determining optimal therapy based on patient-specific risk factors. According to evidence-based guidelines, atrial fibrillation patients with a CHADS2 or CHA2DS2-VASc score of 0 or 1 are classified as being low to intermediate risk for stroke and do not require anticoagulation therapy with warfarin.

METHODS:

This project is a retrospective program evaluation of a pilot ambulatory care pharmacy program designed to: 1) assess atrial fibrillation patients at low or intermediate risk for stroke, and 2) identify opportunities to discontinue warfarin therapy in appropriate patients. The patients involved in the pilot are Kaiser Permanente members from the North Sacramento Valley service area. The inclusion criteria for the pilot requires patients to
have a diagnosis of atrial fibrillation, current use of warfarin, and a CHADS2 or CHA2DS2-VASc score of 0 or 1. Patients have been identified for the pilot by utilizing data extraction from electronic medical records. Pharmacists performed chart reviews to validate CHADS2 and CHA2DS2-VASc scores, rule out other compelling indications for warfarin use (such as prosthetic mechanical heart valve, history of recurrent venous thromboembolus, etc.), and identify patients with potential intervention opportunities to discontinue warfarin and/or initiate aspirin use. After candidates for potential intervention have been identified, recommendations are sent to the cardiologist or primary care physician for approval.

RESULTS & CONCLUSIONS:
The goals of this project are to describe the overall process of the pilot program and to report the anticipated results. Final results and conclusions will be presented when available.

ACPE #:0126-9999-13-182-L01-P
Learning Objectives:
- Describe the process in which patients with atrial fibrillation are determined to be at low risk for stroke and qualify for intervention to discontinue warfarin therapy.
- List reasons why anticoagulation may be necessary in atrial fibrillation patients with CHADS2 or CHA2DS2-VASc scores of 0 or 1.


173 - ASSESSMENT OF PREEMPTIVE URINE TOXICOLOGY SCREENING FOR PATIENTS TREATED IN A COMPREHENSIVE CANCER CENTER PAIN CLINIC
B4. General Clinical Practice

Presented by:
James Gibson, PharmD
UW Medicine
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Presenting on Tuesday, May 14 at 3:00 PM in Royal III

Introduction: The Seattle Cancer Care Alliance (SCCA) pain clinic implemented a new urine drug toxicology (UDT) screening policy in May 2012 in response to Washington State House Bill 2876. This bill calls for more stringent prescribing and documentation practices for providers who manage patients with “chronic, non-cancer pain”. Since the SCCA pain clinic cares for an amalgam of patients with both cancer and non-cancer pain, it was necessary for the newly adopted policy to adhere to state regulations yet not be overly restrictive for those patients who fell outside the scope of the bill (i.e. those with cancer-associated pain). For the purposes of UDT screening, it was decided patients would be assigned a risk score to reflect their likelihood of opioid misuse. This risk score is based upon the patient’s daily morphine equivalent dose, his/her score on the physician performed Opioid Risk Tool, and any history of aberrant behaviors. A patient’s assigned risk group mandates the frequency (yearly versus two to four times per year) and type (immunoassay versus liquid chromatography-mass spectrometry) of random UDT screening.

Methodology: This quality assurance project entailed a retrospective chart review of patients managed in the SCCA pain clinic. The frequency of positive UDT screenings (defined as either presence of an unprescribed substance or absence of a prescribed substance) was analyzed within each patient risk group. The aim of such analysis was to evaluate the ability of the clinic’s current risk stratification system to correctly identify high-risk
patients managed for cancer pain, a population for which there is very limited data to support UDT monitoring. Provider adherence to the clinic’s guidelines was also assessed via chart review.

Results: Results are forthcoming.
Conclusion: Conclusions are forthcoming.

ACPE #:0126-9999-13-183-L01-P
Learning Objectives:
- Describe the health, financial, and societal impact of opioid abuse.
- Explain how the evidence supporting urine drug toxicology screening relates to patients with cancer-associated pain.


174 - EFFECT OF A PHARMACIST-BASED DISCHARGE TEACHING AND POST DISCHARGE TELEPHONE FOLLOW-UP ON 30 DAY READMISSION RATES
B4. General Clinical Practice

Presented by:
Billy Gibson, PharmD
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Presenting on Tuesday, May 14 at 2:30 PM in Royal III

Introduction: Adverse drug events affect 11-17% of patients during the first few weeks following hospital discharge. Certain patients are at even higher risk for clinically important medication errors; those include the elderly, patients with low health literacy, and patients receiving certain high-risk medications. The objective of the process improvement (PI) initiative presented here was to determine whether pharmacist involvement during the peri-discharge period could improve 30 day readmission rates and patient satisfaction.

Methodology: The PI initiative occurred during the month of January, 2013 and included adult patients hospitalized in the Progressive Care Unit (PCU) of a 198 bed, acute care, regional hospital in Wenatchee, Washington who were receiving or had prescription(s) for high-risk medications including anticoagulants, dual antiplatelet therapy, digoxin, insulin, and/or long acting opiates. Participants were provided with medication handouts and education using the teach-back method. Tailored follow-up phone calls were then placed, by the intervening pharmacist, 1 to 4 days from discharge. The primary outcome was 30 day readmission rates. The secondary outcome was patient satisfaction, as compared to patients who did not receive the intervention.

Results: Twenty-eight patients were eligible for inclusion in the PI initiative. None of the 25 patients who are beyond 30 days from discharge have been readmitted. This significantly improves upon the PCU’s current readmission rate of 13%, or roughly 3 per 25 patients. Follow-up phone calls permitted the pharmacist to remedy medication-related problems for 5 patients (18%). None of the patients contacted reported new medical problems and only 2 presented concerns about their overall health. Six patients (21%) were unable to be reached and were considered lost to follow-up. Patient satisfaction scores for the PI period have yet to be determined, but may be difficult to correlate with the outcome of this PI initiative given that an average of 219 patients are discharged from the PCU each month and only 28 (13%) were included in the PI initiative.
Conclusion: The preliminary data presented here support the idea that a targeted, pharmacist-based discharge education and follow-up phone call can improve 30 day readmission rates, resolve medication-related problems and may also improve overall patient satisfaction.

ACPE #:0126-9999-13-184-L01-P
Learning Objectives:
  - Describe the hurdles associated with implementing a pharmacist-based discharge teaching program.
  - Explain which patients are at an increased risk for clinically important medication errors.


175 - ASSESSMENT OF COST SAVINGS ASSOCIATED WITH PHARMACIST DRIVEN ANTIBIOTIC DE-ESCALATION
A1. Infectious Disease - Anti-infective Agents

Presented by:
Rebecca Gieser, PharmD
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Presenting on Tuesday, May 14 at 2:30 PM in Garden

Background:
The focus on improving antimicrobial usage through antimicrobial stewardship programs is being driven by the increasing prevalence of multi-drug resistant organisms, increasing rates of Clostridium difficile infections, and decreasing production of novel antimicrobials. Benefis Health System’s current antimicrobial stewardship program includes an updated antibiogram, empiric antimicrobial order sets, and empiric treatment algorithms based on current guidelines and local resistance patterns. Benefis has recognized de-escalation as an area for potential improvement in current antibiotic usage.

Purpose:
This study was designed to evaluate the appropriateness of antibiotic de-escalation at Benefis Health System to determine the utility and cost benefit of an infectious disease pharmacist position.

Methods:
A retrospective audit was conducted to assess appropriateness of antibiotic selection, de-escalation, and duration. One hundred eighty charts from October 1, 2011 through March 31, 2012 were selected based on an electronic search for disease states coding to urinary tract infection, pneumonia, skin and skin structure infection, or septicemia. Assessment included reviewing medical history, patient condition (including hemodynamics, temperature, diet, labs, etc), along with culture and sensitivities. Antibiotic appropriateness was determined based on current IDSA guidelines and the local antibiogram. Potential savings in antibiotic expenditure was documented.

Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-185-L01-P
Learning Objectives:
  - Describe appropriate times for de-escalation of antibiotic therapy.
  - Explain the potential institutional cost savings of an infectious disease pharmacist position.
176 - ESTABLISHING A METHOD TO ESTIMATE ECONOMIC IMPACT OF PHARMACIST-PROVIDED MEDICATION THERAPY MANAGEMENT

E1. Managed Care

Presented by:

Sonia Gill, PharmD
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Presenting on Wednesday, May 15 at 3:00 PM in Sunset II

Introduction:
Though it has been historically practiced by many pharmacists as “pharmaceutical care,” Medication Therapy Management (MTM) was officially recognized by the federal government in the Medicare Prescription Drug, Improvement and Modernization Act of 2003. It required Medicare Part D plans that offer prescription drug coverage to establish MTM programs for eligible beneficiaries. While there are a number of studies establishing the clinical impact of pharmacist-provided MTM services, there are few publications which identify the potential cost savings of pharmacist interventions on health care utilization. The drug therapy problems identified and recommendations made often closely align with quality metrics related to long-term outcomes and these will be analyzed as well.

Methodology:
This prospective pilot study is intended to create a standard way of selecting cost avoidance categories associated with MTM. It will be applied to the first 100 Providence Health Plans MTM-eligible beneficiaries of 2013 for a one month intervention from January to February 2013. The primary objective of this study is to establish a preliminary method to estimate short-term cost avoidance for the most common pharmacist MTM interventions to be applied to a subset of MTM-eligible members. When conducting comprehensive medication reviews with these members telephonically, pharmacists will use their clinical judgment in selecting a cost avoidance category. The cost avoidance component will be implemented by four full-time pharmacists. In addition to estimating the cost avoidance, these members will receive follow-up calls to determine if the drug therapy recommendations were implemented. The secondary objective of this study will be to describe and assess the results from follow-up for patterns related to the implementation of these recommendations and the potential long-term outcomes of these recommendations. The results from this study will help guide further method development in estimating cost avoidance for the Providence Health Plan MTM program and hopefully shed light on the value of this program for Providence Health Plans in the Oregon region.

Results/Conclusion: To be presented after completion of data collection

ACPE #:0126-9999-13-186-L01-P
Learning Objectives:
- Describe a systematic approach of measuring outcomes associated with MTM interventions.
- Describe potential barriers to the implementation of pharmacist MTM recommendations.

177 - MEDICATION USE EVALUATION OF INTRAVENOUS IMMUNE GLOBULIN
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

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Presenting on Wednesday, May 15 at 11:30 AM in Sunset III

INTRODUCTION: Intravenous Immune Globulin (IVIG) is prepared from a pool of immunoglobulin G from human donors. A clear mechanism of action has not been elucidated, but IVIG apparently derives its therapeutic effect by directly protecting against an infection or by various pathways of immune modulation. The FDA has approved IVIG for treatment of: Kawasaki disease, primary immunodeficiency, infection prophylaxis in chronic lymphocytic leukemia, immune thrombocytopenic purpura, pediatric HIV infection, prevention of graft-versus-host disease, and chronic inflammatory demyelinating neuropathy. It has been estimated that IVIG treatment has been studied in over 150 indications. However, there are far fewer indications with significant clinical evidence to support its use. The Ronald Reagan UCLA Medical Center has approved fifteen indications for IVIG use with all others requiring an appeal in order to initiate treatment. In 2011, nearly 900 patients received IVIG treatment at this institution compared to 237 patients in 1999. Given the high cost of acquisition, continual expansion in potentially beneficial uses of IVIG, and increased utilization, an evaluation of IVIG utilization is warranted to integrate justifiable indications for IVIG into hospital policy.

METHODOLOGY: This is a retrospective, observational study of the utilization of IVIG by chart review of all patients treated at the Ronald Reagan UCLA Medical Center in 2012. The indication for use of IVIG, dosing weight (absolute or calculated), total dose per treatment period, and cost of treatment will be evaluated. Treatments of IVIG will be identified as having an approved indication or off-label indications.

RESULTS and CONCLUSIONS: Results and conclusions will be presented at the Western States Conference.

ACPE #:0126-9999-13-187-L01-P
Learning Objectives:
Describe use patterns of IVIG at Ronald Reagan UCLA Medical Center.
List indications for use of IVIG.


178 - SCREENING AND MANAGEMENT OF PATIENTS AT RISK FOR OSTEOPOROSIS IN A PATIENT CENTERED MEDICAL HOME
B1. Ambulatory Care

Presented by:

Neha Giridharan, PharmD
Sutter Health Ambulatory Care/Managed Care
giridhn@sutterhealth.org

178 - SCREENING AND MANAGEMENT OF PATIENTS AT RISK FOR OSTEOPOROSIS IN A PATIENT CENTERED MEDICAL HOME
B1. Ambulatory Care

Presented by:

Neha Giridharan, PharmD
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Introduction:
Sutter Health initiated a patient-centered medical home (PCMH) model of care at a family medicine clinic in Davis, California, with the goals of improving quality and safety while reducing the cost of care. Osteoporosis is of particular interest to the Davis PCMH as an internal review of emergency room (ER) visits found that approximately 10% of ER visits were attributed to falls. Moreover, in this region, there are currently no support services for osteoporosis. As a result, the PCMH implemented a pilot osteoporosis screening and management program as part of routine care for patients 50 years and older that was developed and run by the PCMH clinical pharmacist.

The goal of this study is to evaluate the impact of this pilot program. Results from this study will be used as part of a quality improvement process to determine if the program results in an increase in the implementation of evidence-based guidelines for the prevention and treatment of osteoporosis. Furthermore, an evaluation of this pilot program may provide support to expand it to the entire PCMH staff at Davis and to other PCMH sites within the Sutter Health system.

Methodology:
This will be a retrospective analysis of an osteoporosis screening and management pilot program at a PCMH in Davis, California. The clinical pharmacist completed initial and follow up chart notes for patients who met the inclusion criteria for this program (men and women ≥50 years old). The information from these chart notes will be extracted from the electronic health record (EHR). Outcomes to be measured will include diagnosis of osteopenia or osteoporosis, completion of bone mineral density testing, past and current pharmacotherapy, and lifestyle practices related to bone health at initial and follow up appointments. For all study endpoints, a McNemar’s paired test of proportions will be used to assess statistically significant differences between baseline and follow-up. For all tests, a p-value <0.05 will be considered statistically significant.

Results:
Results will be presented.

Conclusion:
Conclusions will be presented.

ACPE #:0126-9999-13-188-L01-P

Learning Objectives:
- Describe the process of establishing an osteoporosis screening and management program in a patient-centered medical home (PCMH).
- Describe the impact an osteoporosis screening and management program in a PCMH has on the implementation of evidence-based guidelines (e.g. bone mineral density testing, pharmacotherapy, lifestyle modifications).


179 - ASSESSING THE IMPACT OF DRUG SHORTAGES: LABOR AND DIRECT DRUG COSTS
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Tijana Gligorevic, PharmD
Maricopa Integrated Health System
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Presenting on Wednesday, May 15 at 1:00 PM in Sunset III

Background: Drug shortages have a significant impact on acute care inpatient facilities, resulting in compromised patient care, compromised clinical outcomes, and an increased potential for medication errors. Significant financial factors are associated with drug shortages, including increased labor costs and increased cost of purchasing medications. Maricopa Medical Center (MMC) has not formally assessed utilization of pharmacy resources in the form of direct drug costs and in additional staff hours secondary to drug shortages.

Objectives: To quantify the labor cost (hours) required to manage drug shortages and assess the increased cost of drug acquisition (2013 dollars) as a result of drug shortages at MMC.

Methods: A prospective observational study was performed to assess the number of hours and the dollar amount spent in the management of drug shortages. All full time pharmacy staff, including clinical pharmacists, staff pharmacists, pharmacy management, pharmacy technicians, buyer, automation specialist, and pharmacy informatics support specialists, participated in the study. A voluntary data collection sheet was distributed to all participants who recorded the amount of time (hours) spent on job specific duties as they pertain to drug shortages from December 11th, 2012, to February 28th, 2013. Gray market purchases, as well as purchases of outsourced compounded products, were recorded. The outcomes measured included the drug acquisition cost from alternate suppliers and the hours spent by pharmacy staff on tasks related to drug shortages.

Results/Conclusion: To be presented.

ACPE #:0126-9999-13-189-L01-P

Learning Objectives:
- Describe the cost impact of drug shortages on pharmacy budget in inpatient acute care facilities.
- Describe the personnel hours and labor costs associated with drug supply issues for different job roles within pharmacy.


180 - A RETROSPECTIVE EVALUATION OF PATIENTS ELIGIBLE FOR IV TO ORAL SWITCH ON LEVOFLOXACIN THERAPY

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Tuesday, May 14 at 3:00 PM in Garden

Introduction
The prevalence of antimicrobial stewardship programs (ASPs) are increasing as the threat of resistant microorganisms rise against the most current antibiotics. Guiding the appropriate use of the current available antibiotic regimens can limit the emergence of resistance, decrease hospital cost, and shorten the length of hospital stay. Antimicrobial stewardship programs, continuing education for health care professionals and working collaboratively as a multidisciplinary team will help to reduce resistance, cost and improve patient outcomes. Pharmacists can play a key role in the implementation of an ASP to assess the appropriateness of
ordered antibiotics. ASP programs may seem like a novel concept to individual facilities, but this topic has been a growing concern for years. Fluoroquinolones are an ideal starting point to implement an antimicrobial stewardship program. Research has demonstrated the beneficial outcomes of intravenous (IV) to oral conversion of fluoroquinolones in cost effectiveness, improved patient outcomes, and reduced in hospital stay. Our unique population comprised of active duty military at Naval Medical Center San Diego (NMCSD) will also provide useful information when treating these patients. The primary objective of our retrospective analysis of IV levofloxacin utilization is to analyze the differences in length of hospital stay, time to resolution of infection and cost of antibiotics between those who were appropriately switched from IV to oral therapy when indicated and those who met criteria for oral therapy but were maintained on IV therapy. Results from our study will be the first step in the development and implementation of an antimicrobial stewardship program at NMCSD.

Methodology
Demographic data will be collected for inpatients at NMCSD who received IV levofloxacin from November 1, 2011 to June 30, 2012, identified by generating a report using Composite Health Care System (CHCS). Patients will be included if they were treated with IV levofloxacin for at least one dose and were eligible for conversion to oral therapy during their hospital stay. Patients will be excluded if they were <18 years of age, pregnant, not receiving IV fluoroquinolone therapy, unable to tolerate levofloxacin, or had known hypersensitivity to fluoroquinolones. The information will be collected using Essentris® (electronic inpatient charting system) for our patient population. The power of the study is based upon an article on the same subject of 1.2 days (IV to PO when indicated) and 5.7 days (IV prolonged). A power = 0.80 shows that 67 per group (a total of 134 patients) will detect a difference of 2 days. We plan to use a rank-based test. To allow for the rank test’s lesser asymptotic efficiency, we require a 15% larger sample, or N=154 patients.

Results/Conclusion: Pending

ACPE #:0126-9999-13-190-L01-P

Learning Objectives:
- Explain when it would be appropriate to switch from intravenous to oral levofloxacin therapy.
- Compare endpoints between patients treated with levofloxacin who were appropriately switched from intravenous to oral therapy, and patients eligible for oral treatment and were inappropriately maintained on intravenous therapy.


181 - ASSESSING PATIENT AND PROVIDER BARRIERS TO THE IMPLEMENTATION OF MULTI-DISCIPLINARY PAIN PANEL RECOMMENDATIONS
A5. Neuro-Psych or Pain Management Agents

Presented by:
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Presenting on Tuesday, May 14 at 3:30 PM in Palm III

Purpose: Treatment of non-malignant chronic pain warrants a multimodal treatment approach. However, the great majority of patients with chronic pain use analgesics regularly and often without any other modalities of
pain management. Providers may be unaware of or lack time to implement effective multimodal treatment plans, may experience significant difficulty in managing patient pain or have safety concerns associated with the treatment plan. In these cases, the primary care provider may request recommendations from a panel of interdisciplinary providers in an effort to improve the patient’s outcome. This may be the case especially if a patient is treated with higher than standard narcotic doses which impose significant risks for adverse side effects such as hyperalgesia, sedation, constipation, and testosterone deficiency. While treatment with these higher than standard doses may be appropriate in certain cases, there is an obligation to take extra measures to evaluate and monitor the patient for appropriate treatment and safety. Higher-than-standard narcotic dosing should necessitate closer monitoring and adherence to a multimodal treatment plan. Our experience is that many of the pain panel recommendations are not implemented for various unknown reasons and we would like to further assess the reasons why.

Methods: This study will assess implementation of recommendations that were proposed by the local pain panel at the VA Sierra Nevada Health Care System to primary care providers and address both patient and provider barriers related to lack of implementation. Typical recommendations include annual urine drug screens, VA pain agreements on file, biannual PCP follow-up appointments, attendance at a chronic pain management course, use of other non-narcotic agents, and non-pharmaceutical interventions such as physical therapy and mental health services. The study will report the percentage of recommendations implemented by providers and patients and will focus on increasing the number of patients with a pain agreement on file, annual urine drug screens, and biannual PCP visits. Any patient and provider level barriers will be assessed and trended. The results will be used by the VA Sierra Nevada Health Care System in an effort to optimize patient care by providing feedback to the pain panel and providers in an effort to establish a better interdisciplinary pain control approach. Most of the patients who have been reviewed by the pain panel are receiving 200 mg or greater of morphine or morphine equivalents.

Results and Conclusions: Results and conclusions are pending upon data collection and analysis

ACPE #:0126-9999-13-191-L01-P

Learning Objectives:
- Describe some safety concerns associated with higher than standard narcotic doses
- Identify some patient and provider level barriers to implementing multimodal pain treatment plans


182 - COMPARISON OF HIV VIROLOGIC FAILURE RATES BETWEEN PATIENTS WITH VARIABLE ADHERENCE TO THREE ANTIRETROVIRAL REGIMEN TYPES

A1. Infectious Disease - Anti-infective Agents

Presented by:

Lindsay Gordon, PharmD
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Presenting on Tuesday, May 14 at 3:30 PM in Garden

Introduction: A high level of medication adherence has been shown to be both crucial to successful HIV management and a significant challenge for HIV-positive patients. Adherence issues are a leading cause of treatment failure, posing risks of resistance development, morbidity, and mortality. While clinicians continue to promote 100% adherence to patients, it still remains unclear what adherence threshold is adequate to maintain
virologic suppression, and the threshold appears to differ based on the antiretroviral (ARV) regimen. Evidence suggests that an adherence level of at least 95% may be necessary for some regimens. Although this threshold has been the gold standard in HIV therapy, studies of newer, more robust ARV agents have shown that a less stringent adherence threshold may be adequate to maintain virologic control. The Center for Medicare and Medicaid Services (CMS) has proposed a new Healthcare Effectiveness Data and Information Set (HEDIS) 5 Star measure that would include a goal of 90% adherence to ARVs amongst HIV-positive patients. In light of this potentially upcoming measure, the question of adequate adherence thresholds to ARVs again arises. This study will retrospectively examine the effects of ARV adherence rates on the virologic suppression of HIV-positive Southern California Kaiser Permanente patients maintained on one of three ARV regimen types during 12 to 18 months of therapy. The three regimen types are: 1) emtricitabine/tenofovir/efavirenz, 2) emtricitabine/tenofovir + raltegravir, and 3) emtricitabine/tenofovir + Boosted Protease Inhibitors (either boosted darunavir or boosted atazanavir). Results will provide insight as to what adherence threshold is necessary to maintain virologic control when utilizing these regimens.

Methods: Patients at least 18 years of age initiated on one of the three regimen types above between August 31, 2007 and August 31, 2011, and maintained on that regimen for at least 12 months were included in the study. Patients also must have had at least one HIV viral load level drawn 12 to 18 months after the date of regimen initiation. A medication possession ratio was calculated for each patient. The patients were pooled and divided into three levels of adherence: 1) <80%, 2) 80% to 90%, and 3) >90%. Descriptive statistics compared rates of virologic failure between the adherence groups. Virologic failure was defined as two consecutive HIV viral load measurements > 200 copies/mL. To determine differences between the three regimens, the patients on each regimen type were divided into the same adherence levels above, and rates of virologic failure between the adherence groups within each regimen type were compared.

Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-192-L02-P

Learning Objectives:
- Describe the virologic failure rates associated with different levels of adherence to the studied antiretroviral regimens.
- Explain what adherence thresholds are needed to maintain virologic suppression on these regimens.


183 - EVALUATING THE EFFECT OF U-500 INSULIN THERAPY ON GLYCEMIC CONTROL IN TYPE 2 DIABETIC VETERANS
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:
Joseph Granata, PharmD
New Mexico VA Health Care System
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Presenting on Wednesday, May 15 at 9:30 AM in Mission Bay Foyer

Background:
Insulin remains the most effective treatment to quickly reduce hyperglycemia in patients with types 1 and 2 diabetes mellitus. It is thought that by reducing the volume of insulin depot, the higher concentration of insulin found in U-500 provides better insulin absorption, mitigates variable tissue absorption, and less prone to insulin
leakage from the injection site. Previously published studies have demonstrated hemoglobin A1c (A1c) reductions in type 2 diabetics after conversion from U-100 to U-500 regimens. Concentrated U-500 regular insulin has been used at the New Mexico VA Health Care System in the Endocrine Clinic for the past 5 years. The level of A1c change after conversion has not been determined at our facility. It would be worthwhile to establish whether the frequency of provider contacts is associated with any significant improvements.

Objective:
The objectives of this study are to determine the glycemic effect after converting from U-100 to U-500 insulin and its effect based on the frequency of provider contacts. The primary endpoint of the study will be the change in A1c. The secondary endpoint will be the number of provider contacts before and after U-500 insulin initiation.

Methods:
A retrospective chart review will be conducted using patients as their own controls. The electronic database will be used to identify U-500 insulin prescriptions over the past 4 years. Patients will be included if they were switched from U-100 to U-500 with a minimum of one documented A1c at least 6 months prior to the change and any subsequent A1c at least 2 months after the change. Patients must also have had their U-500 insulin managed by the NMVAHCS Endocrine Clinic and have received counseling provided by nurse diabetes educators before starting U-500 insulin. A clinically significant A1c change will be defined as >1% reduction which correlates with the benefits of glycemic control and diabetic complications. Contacts will include any type of contact by a provider with the patient, either in person or via telephone. We will record the number of contacts starting 3 months prior to the first A1c recorded before conversion and the number contacts after conversion up until the final A1c recorded. Other parameters associated with insulin use will also be analyzed. The change in A1c will be compared via a paired t-test. Data will be reported as mean +/- SD. Linear regression analysis will be used to determine if there is a correlation between the number of clinic contacts and change in A1c. A p-value of less than 0.05 will be considered to indicate a statistically significant difference.

Potential Findings:
We anticipate this study will further demonstrate better glycemic control with U-500 versus U-100 insulin in type 2 diabetic patients by virtue of U-500 insulin pharmacokinetics to overcome insulin resistance irrespective of the number of clinical contacts beyond the initial conversion from U-100 insulin regimen. Should the number of contacts correlate with better glycemic control, we may want to consider optimizing the frequency of follow-up to potentially enhance therapy.

ACPE #:0126-9999-13-193-L01-P

Learning Objectives:
List the potential risks and benefits of using U-500 over U-100 for the management of diabetic patients. Explain the role of follow-up frequency and its effect on glycemic control in patients using U-500 insulin.


184 - IMPACT OF LANSOPRAZOLE CO-ADMINISTRATION ON THE ELIMINATION OF HIGH DOSE METHOTREXATE IN THE PEDIATRIC ONCOLOGY POPULATION

B6. Pediatric or Gender Specific Care

Presented by:

Ashley Greene, PharmD
Children's Hospital Colorado
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Background:
Potential drug-drug interactions with proton pump inhibitors and methotrexate have been described in the literature since 1993. While these studies explained the potential prolongation of methotrexate clearance with concomitant proton pump inhibitor administration, strong evidence was still lacking. One retrospective study concluded that proton pump inhibitor administration should be discontinued during methotrexate treatment. The drug interaction was officially noted in the package labeling for methotrexate and omeprazole in December 2011, but the direct mechanism remains unknown. Lansoprazole is a proton pump inhibitor used to treat gastric and duodenal ulcers, gastroesophageal reflux disease, and as an acid suppressive agent. It was not until November, 2011 that Children’s Hospital Colorado began implementing precautions to prevent a potential drug interaction between these medications. Although this warning was derived from data in adults using concomitant omeprazole, Children's Hospital Colorado has discontinued the use of the formulary agent lansoprazole in patients receiving high-dose methotrexate based on this warning. Since omeprazole has been the topic of discussion among case reports, it is unknown whether the risk of concomitant use is universal across proton pump inhibitors. In addition, no formal drug interaction studies have been conducted within the United States regarding the pediatric population, leading to questions as to whether or not this would be reproducible in children. Therefore, a retrospective chart review was conducted in an attempt to correlate delayed clearance after high dose methotrexate therapy with lansoprazole co-administration.

Methods:
This study was completed as a retrospective chart review. The health system's medical electronic record system (EPIC) was used to identify patients who, over a five year period of time from March 2007 through June 2012, were admitted to the hospital to receive high-dose intravenous methotrexate defined as 1000 mg/m2/dose. Patients between the ages of 1 and 18 are included in this study. Each admission for high-dose methotrexate was considered one encounter and evaluated separately. Patients may have had multiple encounters; one for each high-dose methotrexate admission. Correlation studies on the time to methotrexate clearance and co-administration of lansoprazole were performed. Each encounter was characterized as normal or delayed clearance based on their methotrexate levels at defined time points and interventions required. Results and conclusion to be presented.

ACPE #:0126-9999-13-194-L01-P
Learning Objectives:
Describe the relationship between normal and delayed methotrexate clearance and concomitant lansoprazole therapy.
Explain whether pediatric oncology patients should continue to avoid concomitant lansoprazole and methotrexate therapy.


185 - EVALUATION OF WARFARIN MANAGEMENT BY THE ANTICOAGULATION AND DOSING MONITORING PROTOCOLS AT CHILDREN'S HOSPITAL COLORADO
B6. Pediatric or Gender Specific Care

Presented by:

Nicole Greene, PharmD
Children’s Hospital Colorado
Introduction:
The incidence and recognition of thromboembolic events (TEs) in the pediatric population is increasing. Consequently, the number of pediatric patients on oral anticoagulation therapy has also increased. Risk factors including medications, malignancies, congenital cardiac diseases, corrective surgeries, infectious illnesses, and indwelling central venous catheters have all been identified as contributors to the development of a TE in the pediatric patient. Due to convenience in dosing and affordability, warfarin remains the leading oral anticoagulant prescribed in children for both treatment and prevention of TEs. While there is substantial literature evaluating the dosing of warfarin in the adult population, there continues to be considerably less data in the pediatric population. In addition to a paucity of data in the pediatric population, warfarin dosing in children is complicated by multiple variables including age, diet, concurrent medications, medication adherence, and co-morbidities.

The Anticoagulation Dosing and Monitoring Protocols at Children’s Hospital Colorado were put into place in March 2009 to guide warfarin dosing and monitoring. It is imperative to evaluate the safety and efficacy of our protocol in children and determine the appropriateness of our management practices.

Methodology:
This is a retrospective chart review evaluating patients whose warfarin anticoagulation was managed using the Anticoagulation Dosing and Monitoring Protocols at Children’s Hospital Colorado. Patients included were those who started warfarin for primary or secondary prophylaxis in March 2009 through July 2012. Patients included ranged from 31 days to 17 years of age. Data collected will include patient specific characteristics, warfarin dosing and dose changes, international normalized ratios (INRs), bleeding events, recurrent thrombosis events, and reports of missed doses.

Results and Conclusion: Patient data will be analyzed to determine the time each patient needed to achieve their goal therapeutic INR. The Rosendaal Method will be used to calculate the amount of time each patient spent in their goal therapeutic range. Rates of bleeding and recurrent thrombosis events will be assessed using bleeding definitions provided by the International Society of Thrombosis and Haemostasis. We will be characterizing the initial starting warfarin doses of our patients, number of dose changes, and how consistently initial dosing followed protocol.

ACPE #:0126-9999-13-195-L01-P
Learning Objectives:
- List pediatric patient characteristics that influence warfarin management.
- Describe current American College of Chest Physicians Evidence-Based Clinical Practice Guidelines for thromboembolic events (TEs) in the pediatric population.


186 - IMPACT OF RAPID GRAM POSITIVE BLOOD CULTURE TESTING ON MANAGEMENT OF BLOODSTREAM INFECTIONS IN A COMMUNITY HOSPITAL
A1. Infectious Disease - Anti-infective Agents

Presented by:
Sharan Grewal, PharmD
Sharp HealthCare PGY1 Pharmacy Practice Residency
Presenting on Tuesday, May 14 at 4:00 PM in Garden

Introduction:
Inappropriate therapy for treatment of gram-positive bloodstream infections (GP-BSI) is associated with increased mortality, longer durations of hospitalization and increased healthcare costs. Strategies to improve antibiotic selection include the use of molecular assays for rapid gram-positive blood culture identification and resistance determination. Implementation of assays in conjunction with ASP Pharmacist notification is expected to reduce time to optimal antibiosis and may reduce subsequent hospitalization costs in patients with GP-BSI when compared with standard methods of culture and susceptibility reporting. The Verigene® molecular assay is capable of identifying 12 different bacterial types known to cause bloodstream infections. The test allows for simultaneous identification of the bacteria and three associated resistance genes within 3 hours after identification of bacterial growth on gram stain. Traditional methods may require two to four days to produce bacterial identification and resistance results. This study aims to evaluate the cost-benefit of rapid testing coupled with ASP intervention in patients with GP-BSI.

Methodology:
The health system’s electronic medical record will be used to identify patients with gram-positive bacteria isolated from blood cultures during a baseline 4 month period prior to Verigene® implementation for comparison with a prospective cohort of patients with positive Verigene® results during a 4 month period after go-live. Exclusion criteria includes the following: patients less than 18 years of age, gram positive organisms isolated from anaerobic blood cultures only, ≥2 organisms isolated from blood cultures, duration of hospitalization <48 hours, transfer to another acute care facility, transfer to hospice, or patients made comfort care. The following data will be collected: relevant demographic information, source of infection, culture and susceptibility results, antibiotics administered, length of hospital stay, discharge disposition, and pertinent clinical data/labs. The primary outcomes assessed will be average time to optimal antibiotic therapy (OAT) and total cost of hospitalization. Secondary outcomes include time to prescriber notification, time to defervescence, hospital length of stay (LOS), ICU & BSI-related LOS, mortality, and ASP-initiated intervention acceptance rates.

Results and conclusion:
To be presented upon completion.

ACPE #:0126-9999-13-196-L01-P

Learning Objectives:
- Explain the risks of inappropriate/ delayed antibiotic therapy in patients with gram positive blood stream infections.
- Describe the cost-benefit of rapid gram-positive blood stream culture testing in a community hospital with an existing Antimicrobial Stewardship Program


187 - IMPLEMENTATION OF PHARMACOTHERAPY CLINIC FOR UNINSURED AND UNDERINSURED

B1. Ambulatory Care

Presented by:
Anna Grinberg, PharmD
St. Joseph Medical Center
St. Joseph Medical Center is a regional medical center within Franciscan Health System which provides over twenty-six million dollars annually in charity care services. Many of the patients who benefit from charitable care in the hospital lack the resources and opportunities to see a primary care provider that will manage their chronic conditions post-discharge. Studies have shown that two-thirds of adverse events post-discharge are medication related. This number can be even higher in economically disadvantaged patients who have difficulty adhering to their medications or affording prescriptions. Currently, a hospital-adjacent transition clinic is available to manage select discharged patients for up to six weeks. The proposed pilot program will establish an indigent care pharmacotherapy clinic co-managed by volunteer physicians and clinical pharmacists. Pharmacists will accept referrals from transition clinic providers, emergency room triage and primary care providers within the health system. Patients will be managed through a collaborative care process between pharmacists and volunteer providers. This clinic will establish a new model of care, extend the medical-home model, and supplement a current gap in our system. The goal is to better manage overall health care costs and utilization by maintaining patients’ health through the use of cost-effective and clinically appropriate prescription regimens as well as empowering patients through education. This service is also expected to reduce the burdens faced by the emergency department where each day, dozens of patients request medication refills, due to a lack of access to primary care or affordable medications. The clinic will serve as a safety-net for the uninsured and underinsured. The clinic will utilize established protocols and develop additional protocols as needed to manage chronic disease states. Current anticoagulation and immunization protocols will be utilized. Collaborative Drug Therapy Agreements (CTDA) will be written and Board of Pharmacy approved for asthma, chronic obstructive pulmonary disease, diabetes, gastroesophageal reflux disease, hypertension, hyperlipidemia, hypo/hyperthyroidism, heart failure, and seasonal allergies.

Results and conclusions will be presented.

ACPE #:0126-9999-13-197-L01-P
Learning Objectives:
- Describe the implementation of a multidisciplinary indigent care clinic.
- Describe the role of a clinical pharmacist in the transitional care of uninsured or underinsured patients.

about previous hypersensitivities is crucial in preventing medication errors and increasing patient safety. According to Gleason KM, et al., medication discrepancies can range from 30-70% at the time of hospital admission. In addition, 85% of medication errors that occurred during admission were due to an inaccurate medication history. The Joint Commission has recognized the importance of medication reconciliation by incorporating it as a National Patient Safety Goal.

Objective: To evaluate the impact on the quality of medication reconciliation by implementing a pharmacy-led medication history review service at the NorthBay Medical Center Emergency Department (ED). At this institution, the ED nurses serve as the standard of care for conducting medication history interviews. The primary objective was to compare the rate of medication and allergy discrepancies among the ED nurses and pharmacy interns. Secondary analysis included the number and types of interventions completed by pharmacy interns.

Methods: This prospective cohort study compared two sets of patient groups: control group – interviewed by ED nurses using a standardized process and the intervention group – led by pharmacy interns using a similar interview process. Inclusion criteria included patients 18 years or older, having at least one maintenance medication, and being admitted to the hospital by the physician. Exclusion criteria included altered mental status or level of consciousness without a caregiver present. During designated hours, the pharmacy interns alternated with ED nurses to complete medication history interviews. To provide the current standard of care, the nursing staff subsequently interviewed patients from the intervention group. The second interview was not included in the study. Pharmacy interns were evaluated on their ability to conduct patient interviews using evidence-based interviewing techniques from the Institute for Safe Medication Practices. Medication history audits were completed by the primary investigator and confirmed with the patient, caregiver, or family member and community pharmacies.

Results & Conclusion: Collected data is currently being evaluated and will be analyzed with STATA using appropriate statistical tests.

ACPE #:0126-9999-13-198-L05-P

Learning Objectives:
- Describe the impact of a pharmacy-led medication reconciliation service in the emergency department in terms of patient safety and quality of care.
- Provide insight on patient perspectives and their role in disclosing medication history information.


189 - EVALUATION OF PATIENT OUTCOMES AND RESOURCE UTILIZATION OF PLERIXAFOR FOR AUTOLOGOUS STEM-CELL MOBILIZATION AND TRANSPLANTATION

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Julie Guglielmo, PharmD
University of California, Davis Medical Center
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Presenting on Tuesday, May 14 at 10:30 AM in Sunset I

Introduction: Plerixafor, in conjunction with granulocyte-colony-stimulating factor (G-CSF), improves peripheral stem cell mobilization in autologous stem cell transplant patients. In current practice, physicians prescribe four
vials at a time for mobilization. Most patients require less than the allotted four vials to collect an adequate amount of stem cells and the remaining vials must be wasted. The purpose of this study is to assess the average number of vials used per patient to collect an adequate amount of stem cells in order to identify a more efficient method of dispensing.

Methodology: This is an investigator initiated, single center, retrospective chart review. The UC Davis Health System’s (UCDHS) bone marrow transplant database was used to identify patients transplanted at UCDHS. Chart review was completed to identify patients who had received plerixafor. The Clinical Hematopoietic Progenitor Cell Laboratory provided the patients’ cell collection data such as number of cells collected and total number of collection days. Descriptive statistics were used to determine the mean number of cells collected per day as well as the median number of collection days required. Proportion confidence intervals will be completed to describe the percentage of patients who used 1 vial, 2 vials, 3 vials or 4 vials.

Results: The median number of days required to collect the desired number of stem cells was two. Fifty seven percent of patients required two or less vials, 20% of patients required three vials and 22% of patients required 4 or more vials.

Conclusion: Most patients who received autologous stem cell transplants at UCDHS from 2008-2012 required less than the four prescribed vials of plerixafor. With more efficient dispensing and billing strategies, transplant centers would reduce significant costs associated with wasted plerixafor vials.

ACPE #:0126-9999-13-199-L01-P
Learning Objectives:
- Describe the role of plerixafor in stem cell mobilization.
- Explain the weaknesses in the current dispensing process for plerixafor.


190 - IMPACT OF REDUCING UNNECESSARY PROTON PUMP INHIBITOR USE ON INCIDENCE OF CLOSTRIDIUM DIFFICILE COLITIS

A1. Infectious Disease - Anti-infective Agents

Presented by:

**David Ha, PharmD**
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**Presenting on Tuesday, May 14 at 5:00 PM in Garden**

BACKGROUND  Proton pump inhibitors (PPIs) are one of the most commonly prescribed medications. Numerous studies have shown they are overused during inpatient admissions despite being linked to an increased rate of pneumonia and fractures. There is a growing evidence base that PPI use increases risk of Clostridium difficile infection (CDI), however, to date, there has been no published systematic intervention to reduce this risk. We will investigate the impact of a CPOE indication-based order set on the incidence of CDI in an inpatient population. Evidence-based guidelines for appropriate PPI use were developed by a multidisciplinary team and were programmed into an indicated-based order set within the hospital electronic medical record.

OBJECTIVE  To assess the impact of a CPOE indication-based order set for proton pump inhibitors on incidence of Clostridium difficile colitis.

METHODS  This will be a retrospective pre- and post-intervention study of CDI incidence in hospital inpatients. The intervention is a CPOE indication-based order set for proton pump inhibitors that was implemented on
August 15th, 2011. Patients admitted to UCSD Medical Center from August 1st, 2010 to July 31st, 2011 will serve as the pre-intervention cohort and patients admitted from September 1st, 2011 to August 31st, 2012 will serve as the post-intervention cohort. The primary outcome will be the difference in CDI incidence between the pre- and post-intervention cohorts. Logistic regression analysis will be used to identify the relative risk of CDI with PPI use amongst other CDI risk factors (i.e. immunosuppressive conditions and concomitant use of antibiotics, immunosuppressants and chemotherapeutics). Secondary outcomes will include recurrence of CDI, length of stay, adherence to PPI order set guidelines and readmission rate.

RESULTS AND CONCLUSION The findings of this study will be presented after completion.

ACPE #:0126-9999-13-200-L01-P
Learning Objectives:
- Describe the effect of proton pump inhibitors on risk of Clostridium difficile colitis.
- Explain the effect of a CPOE order set on appropriate proton pump inhibitor use and Clostridium difficile colitis.


191 - IMPLEMENTATION OF A DISCHARGE PHARMACIST SERVICE
B4. General Clinical Practice

Presented by:
Shawn Hagland, PharmD
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Presenting on Tuesday, May 14 at 4:00 PM in Royal III

As hospitals implement programs to improve transitions of care and reduce hospital readmission rates, pharmacists can play an important role to maximize these outcomes. The hospital discharge process is complex, and can become rushed and disorganized, leaving patients vulnerable to medication errors and poor discharge medication counseling. The primary objective of this project is to design a discharge pharmacist service. The discharge pharmacist will provide medication reconciliation and bedside medication counseling for patients requiring multiple new medications at hospital discharge. Discharge medications will be filled through the hospital’s outpatient pharmacy and delivered to the patient’s room before hospital discharge. A priority review will be given to patients who have a history of heart failure, COPD, or diabetes mellitus; require anticoagulation therapy after discharge; or have been readmitted to the hospital within 30 days. Secondary objectives include (1) improving patient safety by reducing medication errors through pharmacist medication reconciliation review, (2) expanding patient access to discharge medications by eliminating barriers that delay the filling of discharge prescriptions, and (3) increasing revenue for the pharmacy department to support the service. Results and conclusions will be presented.

ACPE #:0126-9999-13-201-L04-P
Learning Objectives:
- Identify the barriers and strategies to implementing a pharmacist managed medication reconciliation and discharge medication counseling service.
- Describe the impact a discharge pharmacist service may have on the quality and outcomes of care when patients transition from the hospital to the ambulatory setting.
192 - ADDRESSING VIROLOGIC FAILURE IN HIV PATIENTS THROUGH THE PATIENT CENTERED MEDICAL HOME CARE MODEL

Presented by:

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Presenting on Tuesday, May 14 at 4:30 PM in Garden

Background: HIV-infected patients experiencing virologic failure are high-risk patients who can be challenging to manage. Due to the complexity and variety of factors that can contribute to virologic failure, application of the team-based Patient Centered Medical Home (PCMH) model to this patient population is expected to guide allocation of resources through targeted interventions and produce desirable health outcomes.

Methods: In April 2012, a multi-disciplinary PCMH team at an outpatient clinic for HIV-infected patients identified 147 adults with an HIV RNA (viral load) > 1000 copies/mL and an antiretroviral therapy (ART) regimen currently actively prescribed. This cohort of 147 patients was further divided into the following subcategories: first viral load (VL) > 1000 copies/mL or new diagnosis (n =16), on ART for < 1 year (n=28), VL > 1000 copies/mL for > 1 year (n=32), and VL > 1000 copies/mL for > 2 years (n=71). In May 2012, the PCMH team began to review the cohort of 71 patients with a VL > 1000 copies/mL for 2 years to identify barriers to achieving virologic suppression. This single-center, retrospective, unmatched chart review was conducted on all patients who were included in this cohort. The primary endpoint was achievement of virologic suppression or the surrogate of a 2 log reduction in VL within 6 months after the date of the PCMH meeting during which the patient was discussed. Secondary endpoints included incremental improvements in desirable health outcomes (e.g. referral and follow up with behavioral health or clinical pharmacy services) and identification and classification of potential barriers to treatment success.

Results: PCMH review of the 71 patients was completed on February 5, 2013. Results from 20 patients who were subsequently followed for at least 6 months are available at this time. Of these 20 patients, 16 (80%) had a follow-up VL after the date of the PCMH meeting. Of these 16 patients, 3 (18.8%) achieved an undetectable VL and 3 (18.8%) had at least a 2 log reduction in VL following the PCMH meeting. There was no significant change in the VL for the 10 remaining patients. Potential contributing factors to virologic failure were classified as follows (n,%): behavioral health issues (13,65%), current or recent substance abuse (6,30%), insurance eligibility issues (4,20%), resistance to current therapy (3,15%), medical comorbidity precluding adherence (3,20%), adverse effect to ART (2,10%), patient refusal (1,5%), drug-drug interaction (1,5%), and miscommunication (1,5%). Of the 20 patients, 11 (55%) had at least 2 contributing factors.

Conclusions: Since the patient cohort targeted for application of the PCMH care model in this case was very complex, a rate of virologic suppression or significant reduction in VL of 37.6% was unexpectedly high and indicates that the PCMH model is an effective method for managing this patient population. However, since the majority of patients had evidence of behavioral health issues or substance abuse as a contributing factor to virologic failure, using a predictive tool and triaging patients to a behavioral health specialist prior to application of the PCMH model may prove beneficial and more efficient.

ACPE #:0126-9999-13-202-L02-P
Learning Objectives:
List the barriers encountered in achieving virologic suppression in HIV patients.
Discuss the role of the Patient Centered Medical Home care model in impacting health outcomes in HIV patients.


193 - INFORMATION TECHNOLOGY TRIGGERS FOR IDENTIFYING HIGH-RISK PATIENTS WHO MAY BENEFIT FROM CLINICAL PHARMACY INTERVENTIONS
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
Erin Hamai, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Palm II

Background:
The National Committee for Quality Assurance (NCQA) PCMH standards, developed to improve the quality of primary care, includes the identification of high-risk patient populations for care management through information technology (IT). AltaMed Health Services, which operates a large network of safety net clinics, identifies high-risk patients through an IT query that primarily focuses on disease severity. The USC School of Pharmacy developed approximately 4 dozen IT triggers that incorporate medication-related data elements designed to identify potential gaps in the quality and safety of medication therapy. However, it is not known whether the IT triggers developed by USC will identify patients that are different from the set identified through AltaMed’s IT triggers, nor how efficient or sensitive the triggers are in identifying patients in need of clinical pharmacy services.

Methodology:
This study will be performed by applying both sets of data queries to the AltaMed patient population, confined to a period of one calendar year. Medical record reviews for patients enrolled in clinics with integrated clinical pharmacy teams will be performed to determine if the triggers identified patients who are at high risk for medication-related quality and safety problems. Then the data sets derived from AltaMed and USC-based queries will be compared to determine the portion of identified patients who are overlapping as opposed to being unique to each data set. USC queries that are relatively low in sensitivity will be refined in an attempt to produce higher granularity and yield. Descriptive statistics will be applied to most results, and multivariate analyses may be applied to identify variables associated with high-risk patients.

Results:
To be presented.

ACPE #:0126-9999-13-203-L01-P
Learning Objectives:
Describe the differences in high-risk patient populations identified through IT-based queries incorporating medication-related data versus those identified through an established query based on disease severity.
Describe the sensitivity of medication-related IT queries in identifying patients who are likely to benefit from clinical pharmacy services and query refinements to increase granularity and yield.
194 - IMPROVING THE REDOSING OF INTRAOPERATIVE PROPHYLACTIC ANTIMICROBIALS THROUGH UTILITY OF A REMINDER WORKSHEET

A1. Infectious Disease - Anti-infective Agents

Presented by:

Carrie Hammer, PharmD
Maricopa Integrated Health System
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Presenting on Tuesday, May 14 at 8:00 AM in Mission Bay

Background: Surgical site infections (SSIs) constitute a common cause of hospital-acquired infection and subsequent postoperative morbidity and mortality. Prophylactic antimicrobials may be administered during the perioperative period to minimize the risk of SSIs. However, in order for antimicrobial prophylaxis to be effective, adequate serum and tissue levels of the administered antimicrobial must be achieved prior to incision and maintained throughout the procedure through timely redosing based on the length of the surgical procedure and estimated blood loss (EBL).

Objectives: To assess the effectiveness of a reminder worksheet on improving the appropriate redosing of intraoperative prophylactic antimicrobials based on the time since previous dose and EBL.

Methods: The Anesthesiology and Pharmacy Services generated a worksheet to serve as a tool to ensure appropriate redosing of intraoperative prophylactic antimicrobials based on individual antimicrobial pharmacokinetics. A retrospective chart review was conducted to compare the percent of appropriately redosed antimicrobials 2 months prior to and after implementation of the worksheet. Patients were included in the study if they were at least 18 years of age, underwent a surgical procedure lasting at least 240 minutes, and received at least 1 preoperative dose of one or more of the following prophylactic antimicrobials: cefazolin, ceftoxitin, cefuroxime, clindamycin, ertapenem, gentamicin, levofloxacin, metronidazole, or vancomycin.

Outcomes: The primary outcome was appropriate redosing of intraoperative antimicrobials based on time since previous dose and EBL. Additional comparisons included length of surgical procedure, EBL, and the submission and completion of the antimicrobial portion of the reminder worksheet in the post-implementation group.

Statistical Analysis: The primary outcome was analyzed using Fisher’s exact test. Comparisons of characteristics between groups are reported using descriptive statistics. All mean values are presented as mean ± standard deviation.

Results: A total of 61 patients were included in the pre-implementation (N = 30) and post-implementation (N = 31) groups. The patients averaged 45 ± 16 years of age with a mean creatinine clearance of 84 ± 22 mL/minute. The average length of surgical procedures was comparable between the pre- and post-implementation groups at 349 ± 106 and 345 ± 142 minutes, respectively. EBL met or exceeded 1500 mL in 2 patients (6.7%) in the pre-implementation group and 3 patients (9.7%) in the post-implementation group. A total of 32 and 33 prophylactic antimicrobials were administered in the pre- and post-implementation groups, respectively. Cefazolin, the most frequently utilized antimicrobial, was used in the pre- and post-implementation groups for 80.0% and 90.3% of patients, respectively. The percent of appropriately redosed antimicrobials increased from 56.3% in the pre-implementation group to 96.9% after the implementation of the reminder tool (P<0.001). In the post-implementation group, the reminder worksheet was submitted for 22 procedures (71.1%). Of those submitted, 20 included completed antimicrobial redosing portions (90.9%).
Conclusion: The implementation of a reminder worksheet significantly increased the percent of appropriately redosed intraoperative prophylactic antimicrobials.

ACPE #:0126-9999-13-204-L01-P
Learning Objectives:
- Describe the evidence and recommendations supporting the appropriate redosing of intraoperative prophylactic antimicrobials.
- Describe the effectiveness of a reminder worksheet in improving the appropriate redosing of intraoperative prophylactic antimicrobials.


**195 - INTEGRATION OF CLINICAL PHARMACY SERVICES INTO AN URBAN COUNTY NETWORK OF PATIENT-CENTERED MEDICAL HOMES**

B1. Ambulatory Care

Presented by:

**Sherwit Harieg, PharmD**

University of Southern California School of Pharmacy

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*Presenting on Tuesday, May 14 at 10:00 AM in Royal I*

Background: The inappropriate use of medications is a major cause of poor healthcare quality, medication-related harm, and major avoidable costs. Based on reports, projects, and/or experience from the United States Public Health Service (USPHS), the Centers for Disease Control (CDC), the Health Resources and Services Administration (HRSA) Patient Safety and Clinical Pharmacy Services Collaborative (PSPC), and the Patient-Centered Primary Care Collaborative (PCPCC), clinical pharmacy services drastically improve medication-related outcomes, medication safety, and reduce healthcare costs. The Los Angeles County Department of Health Services (LAC DHS) provides primary care to 240,000 patients through Patient-Centered Medical Homes (PCMHs) that currently do not include clinical pharmacists. The purpose of this study is to develop a proposal for the integration of clinical pharmacy services into an urban county network of patient-centered medical homes.

Methods: Medical records for both primary and urgent care patients receiving care from an LAC DHS Medical Ambulatory Care Centers (MACC) was reviewed to identify potential medication-related problems that reflect gaps in medication-related safety and quality of care. Medication safety information was gathered by collecting the types and numbers of adverse drug events and potential adverse drug events using a tool developed by USC and adopted by HRSA for a national collaborative. The estimation of the number of clinical pharmacists needed was based on local and national ratios of clinical pharmacists to physicians in medical homes. Descriptive statistics were used to analyze results. Multivariate analyses were performed to identify key variables associated with patients presenting with potential medication-related problems.

Results: To be presented.

Conclusion: Preliminary data will be presented.

ACPE #:0126-9999-13-205-L05-P
Learning Objectives:
- Explain the need for the integration of clinical pharmacy services into an urban county network of patient-centered medical homes (PCMHs).
Describe opportunities to improve the safety and efficacy of medication therapy in the LAC DHS system.


196 - EVALUATION OF A PHARMACIST-LED SIX-MONTH WEIGHT LOSS PROGRAM IN OVERWEIGHT PATIENTS
B2. Community Practice

Presented by:

Mark Harmon, PharmD
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Presenting on Tuesday, May 14 at 9:30 AM in Sunset V

Introduction:
On November 29, 2011, the Centers for Medicare and Medicaid Services (CMS) posted the Decision Memo for Intensive Behavioral Therapy for Obesity stating it will cover intensive behavioral weight loss therapy for patients who have a body mass index (BMI) > 30 kg/m². The coverage includes one face-to-face visit every week for the first month, then one face-to-face visit every other week for months 2-6. At the sixth month visit, if the beneficiary has achieved a weight loss reduction of > 3 kg (6.6 lbs), CMS will continue to pay for one face-to-face visit each month for an additional six months. CMS is offering reimbursement to primary care physicians, nurse practitioners, clinical nurse specialists, and physician assistants for the treatment of obese patients. Pharmacists are not mentioned in the decision memo. However, with the growing number of obese patients, pharmacists, being the most accessible health care professionals, can play a major role in the care of obese patients. The purpose of this study is to evaluate the efficacy of a pharmacist led weight loss program designed after the general requirements set forth by the CMS decision memo for intensive behavioral therapy for obesity. The goal is for the patients in the study to meet the 6 month weight loss requirement of > 3 kg.

Methods:
This study is a pilot weight loss program designed and implemented by pharmacists following the CMS guidelines. Twelve patients with a BMI > 30 kg/m² or a BMI > 27 kg/m² with an additional comorbidity including diabetes, hypertension or dyslipidemia were enrolled in the study with a total of 14 face-to-face visits. Patient weights were measured at every visit and a total body composition was performed at the first and last visits. A nutrition history questionnaire was administered at the first and last visits to assess patients’ change in food selection over the course of the study. During the visits, patients were given behavioral, dietary and nutritional education to empower them to make wise diet and exercise decisions. Patients were encouraged to make goals during each visit regarding the provided educational content.

Results & Conclusion:
The outcomes of this study are under investigation, with patient visits currently being conducted. Final results and conclusion will be presented at the Western States Conference.

ACPE #:0126-9999-13-206-L01-P
Learning Objectives:

- Explain why pharmacists are in a unique position to offer intensive behavioral therapy for weight loss.
- Describe the role pharmacists can have in managing overweight or obese patients using intensive behavioral therapy.
**197 - IMPLEMENTATION OF AN INFECTIOUS DISEASE PHARMACIST AT A 366 BED REGIONAL MEDICAL CENTER**

A1. Infectious Disease - Anti-infective Agents

Presented by:

Nathan Harold, PharmD
St. Joseph Medical Center; Tacoma, WA.

nathanharold@fhshealth.org

*Presenting on Tuesday, May 14 at 8:30 AM in Mission Bay*

Introduction:

The careful use of antibiotics is an important strategy in retaining the effectiveness of current treatments for infectious diseases. Health systems have addressed this issue by establishing antimicrobial stewardship committees or infectious disease consult services and by employing infectious disease physicians and pharmacist specialists. This project is designed to pilot an infectious disease pharmacy service with objectives to decrease the overall average days of antimicrobial therapy per patient admission, optimize selection and duration of antimicrobial therapy, and evaluate the total quantity and overall response rate to pharmacists’ clinical interventions.

Methodology:

The project’s primary objective is to design and pilot an infectious disease pharmacist service at St. Joseph Medical Center and evaluate additional clinical services provided to patients requiring antimicrobial therapy. The Infectious Disease pharmacist will identify patients receiving empiric antimicrobial therapy and conduct a thorough review of their infectious disease management, providing recommendations in accordance with our institution’s Antimicrobial Stewardship Committee guidelines. A retrospective cohort of patients, case matched on baseline characteristics, will be used as a control group to evaluate the impact of clinical interventions. Patient cases identified during the project will undergo a prospective review to evaluate the duration of antimicrobial therapy per patient stay. Secondary outcomes measured include; overall use of piperacillin/tazobactam, meropenem, linezolid, and daptomycin; length of stay; and response rate to clinical interventions further stratified by type of intervention. Information collected throughout this project will be used to justify the financial viability and benefit to patient care possible with the addition of an infectious disease clinical pharmacy specialist.

Results and Conclusion:

The findings of this project will be presented upon completion.

ACPE #:0126-9999-13-207-L01-P

Learning Objectives:

- Describe at least three clinical interventions for improving antimicrobial stewardship provided through the implementation of an infectious disease pharmacist service.
- Describe at least three metrics used to validate the utility of an infectious disease pharmacist at a regional medical center.

IMPLEMENTATION OF A PROTOCOL FOR ANALGESIA, SEDATION, AND DELIRIUM IN A SURGICAL INTENSIVE CARE UNIT (SICU): A BEFORE AND AFTER STUDY

Presented by:
Jennifer Hartman, PharmD
Renown Regional Medical Center
jahartman@renown.org

Presenting on Tuesday, May 14 at 11:30 AM in Executive 713

INTRODUCTION: Routine evaluation of analgesia, sedation, and delirium in intensive care unit (ICU) patients has been associated with improved patient outcomes including decreased duration of mechanical ventilation and decreased hospital length of stay. The American College of Critical Care Medicine (ACCM) and Society of Critical Care Medicine (SCCM) practice guidelines for pain, agitation, and delirium in adult patients in the ICU recommend validated assessment scales and a protocol to assist in evaluating patients. A multi-disciplinary team approved analgesia, sedation, and delirium protocol for patients admitted to the SICU was implemented at Renown Regional Medical Center on October 6, 2012. The protocol assesses analgesia, sedation, and delirium through the utilization of the Critical-Care Pain Observation Tool (CPOT), the Riker Sedation-Agitation Scale (SAS), and the Confusion Assessment Method for ICU (CAM-ICU) respectively and also includes a subsidiary protocol for daily sedation interruption trials. Hospital formulary medications are listed for each category in the protocol and include recommended initial dosing and titration goal(s) if appropriate. The purpose of this study is to evaluate patient outcomes before and after implementation of the analgesia, sedation, and delirium protocol for SICU patients.

METHODOLOGY: This study is a controlled before and after study of patients 18 years of age and older admitted to the SICU and requiring mechanical ventilation. Retrospective review prior to protocol implementation will be conducted from April 1, 2012 through September 30, 2012. Following protocol implementation, data will be collected from October 8, 2012 through February 28, 2013. The primary objective is to assess the duration of mechanical ventilation in SICU patients prior to and after protocol implementation. The secondary outcomes will include SICU length of stay, hospital length of stay, and the number of unintentional self-extubations.

RESULTS: Results pending at time of abstract submission

CONCLUSION: Conclusion pending at time of abstract submission

ACPE #:0126-9999-13-208-L01-P

Learning Objectives:
List validated pain, sedation, and delirium assessment tools for ICU patients.
Describe an outcome of implementation of a protocol for analgesia, sedation, and delirium in the SICU.


KIDNEY FUNCTION ESTIMATIONS COMPARED TO MEASURED 24-HOUR URINE COLLECTION

Presented by:
Introduction:
The Cockcroft-Gault creatinine clearance estimation is one of the most widely used calculations for determining estimated kidney function. It is broadly used on almost all patients to determine drug therapy management and dosing. The Cockcroft-Gault equation takes into account general information and may not be accurate in patients that are obese, elderly, or adolescent. In this study we evaluate the impact of various factors including age, body habitus, and serum creatinine (Scr) on the bias and accuracy of the Cockcroft-Gault creatinine clearance (C-G CrCl) equation compared with measured 24-hour urine collection.

Purpose:
The aim of this study is to determine accuracy of the Cockcroft-Gault equation by comparing estimated CrCl compared to actual urine output determined by 24-hour urine collection. Specific areas of comparison include: accuracy in children age 12-18 years, obese patients and the elderly, including an evaluation of adjusted body weight calculations and appropriateness of Scr rounding.

Methods:
This study is a retrospective analysis examining data from a hospital in the Denver area. It is being conducted by accessing data from the electronic medical record for patients that underwent 24-hour urine collection while admitted to the hospital. Information on all urine collection patients is being analyzed and compared to calculated information based on their specific demographic. Analysis of patient’s actual urine output over a 24-hour period is being reviewed and compared to the current standard of practice for calculating estimated kidney function. Patients will be assessed based on their weight, height, and age.
Patient populations reviewed include men and women age 12-18 years, 19 to 64 years, age 65 and older, and patients whose BMI calculation of greater than 30 classify them as obese. The use of standard Scr rounding in the elderly population will also be assessed.

Conclusions and results:
Results will be completed in April of 2013. It is hoped that information from this study will help to standardize CrCl calculations in obese, elderly and adolescent patients and add to the current body of knowledge.

ACPE #:0126-9999-13-209-L01-P

Learning Objectives:
Define Cockcroft-Gault creatinine clearance limitations in the clinical setting.
Explain the importance of standardized calculations in patient populations, including the obese and elderly.


200 - EVALUATION OF A REPORTING TOOL FOR MONITORING AND COMPARING PSYCHOTROPIC PRESCRIBING IN COMMUNITY LIVING CENTERS
B5. Long-Term, Geriatric or Hospice Care

Presented by:
Introduction: The Minimum Data Set (MDS) is part of a mandated clinical assessment of all residents in Centers for Medicare and Medicaid (CMS) certified nursing facilities. Online Survey, Certification and Reporting (OSCAR) is a data network maintained by CMS that compiles all the data collected by surveyors during inspections and MDS assessments. Since the VA is not surveyed by CMS, their data is not included into OSCAR even though community living centers (CLCs) complete MDS assessments. Therefore, as the veteran population is unique when compared to other long term care facilities nationwide in both demographics and prevalence of psychiatric conditions, the current available long-term care comparative data does not represent the VA population.

Additionally, the VA-AITC (Austin Information Technology Center) establishes averages for psychotropic use based on MDS data submission from VA CLCs. However, MDS data is only submitted on residents admitted as short-stay or long-stay, on admission and quarterly, and short-stay MDS data is only submitted if the resident has a change in status as defined by MDS criteria. Therefore, this data is not representative of real-time psychotropic frequency of use nor does it capture the entire CLC population.

Due to this lack of guidance for monitoring and comparing psychotropic drug use, VA CLC pharmacists nationwide track and report prescribing frequency with varying techniques. Our goal is to develop a tool to improve monitoring and assessment of psychotropic use that would also allow for standardization of this data collection. Ultimately, we hope to help develop unique national VA benchmarks.

Methodology: With the help of regional programmers and the use of Microsoft SQL Server, our goal is to create a reporting tool as part of a performance improvement project. Only providers working from behind the VA firewall on facility intranet with VISN-approved access will be able to use this report. This report will display frequency of use of various psychotropic medications in a percentage format. The inclusion criteria for this project are those veterans residing in a VA CLC who are receiving a psychotropic medication as defined by VA medication class codes. Hospice residents will be separately analyzed from non-hospice residents. Residents classified as respite care, i.e. residents temporarily admitted to the CLC to provide relief for their primary caregivers, will be excluded from the analysis. Additionally, providers will be able to break down the data into information on specific veterans, medications, dosages, indications for use, dates of use, and number of administrations. Psychotropic medications will be defined as sedatives/hypnotics, anxiolytics, antidepressants, and antipsychotics used to treat psychiatric disorders, terminal delirium, or aggressive/disturbing behaviors/symptoms related to dementia and/or delirium.

Once this retrospective and observational data has been extracted from electronic charts and distilled down to our desired variables, we will perform inter-facility comparisons as well as comparisons of our veteran-specific data against OSCAR data, VA-AITC data, data compiled from our current method of monitoring, and data collected from other relevant VA studies.

Results/Conclusion: Data collection is currently ongoing and results are not yet available.

ACPE #:0126-9999-13-210-L01-P
Learning Objectives:
- Explain the issues with current monitoring of psychotropic use in the VA CLC population.
- Describe the differences between the various methods described and the benefit of the creation of a standardized assessment.

201 - IMPLEMENTATION OF A PHARMACY DISCHARGE MEDICATION DELIVERY PROGRAM AT AN ACADEMIC MEDICAL CENTER
B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 5:00 PM in Royal III

Introduction: Effective bed capacity in an acute tertiary care facility can be increased by streamlining the discharge process. This may be determined by a number of factors including advanced planning and early decision making on the day of discharge. At Ronald Reagan UCLA Medical Center, the pharmacy department was a targeted area in helping to streamline the patient’s discharge. In the past, prescriptions were faxed to the outpatient pharmacy as the patient was leaving the floor, filled and then picked up by the patient/family member after discharge. In developing a more streamlined approach to discharge, the patient can now leave the hospital without having to stop at the outpatient pharmacy.

Methods: The prescription is now faxed with a face sheet indicating that the patient would like to have their prescriptions brought to bedside. This occurs as soon as the team decides that the patient will be discharged. These prescriptions are put in a specific queue, filled and brought up to the patient’s bedside. The pharmacist counsels the patient on all discharge medications and payment is completed using a mobile payment device. Patients are asked to answer a questionnaire and responses are collected to gather feedback for further service improvement. All deliveries are logged for data collection including fax times and delivery times. Monthly trends in pharmacy discharges and program utilization are tracked. The results and conclusion of this study will be presented.

ACPE #:0126-9999-13-211-L04-P
Learning Objectives:
- Describe features of the medication discharge delivery program in the hospital.
- List the benefits of pharmacist involvement in inpatient discharges that positively impact a patient’s healthcare experience.


202 - ORAL BETA-LACTAMS VERSUS ORAL FLUOROQUINOLONES FOR URINARY TRACT INFECTIONS
A1. Infectious Disease - Anti-infective Agents

Presented by:

Madison Hatch, PharmD
Intermountain Healthcare- McKay-Dee Hospital Center
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Presenting on Tuesday, May 14 at 9:00 AM in Mission Bay
Introduction and Background
Urinary tract infections (UTIs) are one of the most commonly encountered community acquired infections. UTIs include acute cystitis which is an infection of the lower urinary tract or urinary bladder or pyelonephritis which extends the infection to the upper urinary tract into the kidneys. Pathogens that commonly cause UTIs include E. coli, Enterococcus, Klebsiella, Staphylococcus and Proteus, with 75%-95% being caused by E. coli. Often, culture and sensitivity data are not available prior to the initiation of antibiotics in a patient with a UTI; therefore, appropriate empiric antibiotics must be selected. Oral fluoroquinolones including ciprofloxacin and levofloxacin are frequently chosen as empiric antibiotics for UTIs due to their historic coverage of enteric gram negative bacteria. However, many studies have recently shown increasing resistance of urinary tract infections to oral fluoroquinolones. With increasing resistance to oral fluoroquinolones, alternative antibiotics are needed to treat UTIs. McKay-Dee Hospital has frequently used oral cefuroxime for UTIs as an alternative to oral fluoroquinolones due to antibiogram data showing cefuroxime's excellent sensitivity profile to E. Coli. Cefuroxime is a second generation cephalosporin with good Staphylococcus and Streptococcus coverage as well as moderate coverage of enteric gram negative organisms. A few studies have shown that fluoroquinolone resistant E. coli have acceptable susceptibility to β-lactams such as cefuroxime. Other studies have shown that β-lactams are not sufficient for treating a UTI. These studies used a three day treatment period whereas McKay-Dee Hospital usually prescribes β-lactams in 7 day courses to treat UTIs. The main objective of this project was to determine the effectiveness of using oral β-lactams compared to oral fluoroquinolones in the treatment of a UTI.

Methods
A retrospective chart review was done to identify patients that were diagnosed in the McKay-Dee Emergency Department with acute cystitis or pyelonephritis between September 2011 and September 2012. Patients were included if they were 18 years of age and older with a diagnosis of a urinary tract infection or pyelonephritis treated with any of the following oral antibiotics: cefaclor, cefprozil, cefuroxime, amoxicillin/clavulanate, amoxicillin, levofloxacin, or ciprofloxacin. All patients must also have had SelectHealth insurance, Medicaid, or had a follow up note in the Intermountain Healthcare system in order for the data to be gathered. Exclusion criteria included pregnant patients, patients that had cultures with more than one organism growing, and cases that used antibiotics other than those mentioned above. The primary outcome was the number of patients that were switched to another antibiotic due to resistance found during a culture follow up or patients that had another antibiotic prescribed in the four weeks following their initial antibiotic prescription. Secondary outcomes included dosing regimens used in patients that were prescribed β-lactams.

Results and Conclusions
Results and conclusions to be presented.

Learning Objectives:
List 4 antibiotics that would be good empiric choices in a patient with a UTI
Explain the reasoning behind considering a β-lactam antibiotic in the treatment of a UTI


203 - CONCOMITANT VASOPRESSIN AND HYDROCORTISONE THERAPY ON HEMODYNAMIC EFFECTS AND VASOPRESSOR REQUIREMENTS IN SEPTIC SHOCK
B3. Critical Care

Presented by:
Introduction:
Severe sepsis and septic shock remains a significant problem in the critically ill patient population despite recent therapeutic advances. Several therapeutic strategies are currently available in the management of septic shock, such as the use of hydrocortisone and arginine vasopressin, which are viable options for patients with refractory septic shock. Although hydrocortisone and arginine vasopressin have separately shown beneficial effects in septic shock, the concomitant use of both agents remains controversial. The purpose of this study is to evaluate the hemodynamics effects and vasopressor requirements with concomitant arginine vasopressin and hydrocortisone in septic shock patients.

Methods:
This will be a multicenter, retrospective, chart review study of adult septic shock patients receiving either concomitant arginine vasopressin/hydrocortisone therapy or monotherapy of either agent. Pertinent demographic and clinical data will be collected, including specific medications administered at baseline such as insulin infusion, dobutamine, and other vasopressor agents (e.g. norepinephrine, dopamine, epinephrine, and phenylephrine). Hemodynamic data, organ dysfunction, and vasopressor dosage requirements will be assessed prior to and post hydrocortisone and/or vasopressin therapy. Therapy continued beyond 24 hours will have hemodynamic data, organ dysfunction, and vasopressor dosage requirements recorded every 8 hours thereafter until study drug discontinuation. Other data to be collected include death rate, length of stay (overall hospitalization and intensive care unit), and adverse drug events related to vasopressin and hydrocortisone use. The primary endpoint of the study is to identify short-term effects on hemodynamic parameters with concomitant hydrocortisone and arginine vasopressin therapy compared to monotherapy. Secondary analyses will compare the mean wean time to vasoactive agents, mortality rates, length of ICU and hospital stay, organ dysfunction and adverse events observed in each study group.

Results and conclusion will be presented.

ACPE #:0126-9999-13-213-L01-P
Learning Objectives:
Describe current practices for hemodynamic management in patients with septic shock
Describe the role that vasopressin and hydrocortisone have in septic shock

Presenting on Wednesday, May 15 at 11:00 AM in Mission Bay Foyer

Background: The American Association of Clinical Endocrinologists (AACE) and the American Diabetes Association (ADA) recommend basal-bolus insulin regimens to manage inpatient hyperglycemia in non-critically ill patients. To improve glycemic control and encourage the use of basal-bolus insulin dosing, Long Beach Memorial Hospital implemented a new basal-bolus insulin order set, which allows physicians to order basal insulin, mealtime bolus-dose insulin, and/or correction scale insulin. The order set also includes fingerstick blood glucose orders, orders for hypoglycemia management, and specifies when to hold insulin doses or contact the physician.

Methods: This was a single-center, retrospective chart review study conducted at Long Beach Memorial Hospital between September 4, 2012 and February 28, 2013. Patients were included if they were at least 18 years of age, prescribed insulin during hospitalization, and were admitted to the general medicine nursing units. Based on the method through which initial insulin orders were prescribed, patients were placed into the insulin order set group or the custom insulin group. The primary objective of this study was to compare blood glucose control between the two groups. Secondary objectives were to evaluate glycemic control for different insulin regimens utilized and to determine the effect of the order set on the occurrence of insulin errors of omission. The results and conclusions will be presented.

ACPE #:0126-9999-13-214-L01-P
Learning Objectives:
- Describe the effect of an inpatient basal-bolus insulin order set on blood glucose control.
- Describe the effect of an insulin order set on rates of insulin errors of omission.


205 - IMPLEMENTATION AND ASSESSMENT OF PHARMACIST INTERVENTIONS DURING DISCHARGE MEDICATION RECONCILIATION
B4. General Clinical Practice

Presented by:
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Presenting on Tuesday, May 14 at 8:00 AM in Royal IV

Introduction: The National Patient Safety Goal 03.06.01, established by The Joint Commission (TJC), is to "accurately and completely reconcile medication across the continuum of care." Studies performed at various healthcare institutions have shown that many medications errors escape the providers’ notice in the discharge medication reconciliation process. Medication-related readmissions at 30-days are generally due to incorrect therapy, not having medication in-hand, and/or non-adherence. There is evidence to suggest that pharmacists can play an important role in improving patient adherence to the appropriate medications at discharge, preventing adverse drug events, and decreasing readmission rates. The purpose of this study is to evaluate the impact of pharmacist involvement during the discharge medication reconciliation process in decreasing medication errors and 30-day readmission rates.

Methodology: This study was conducted in a 400-bed private, non-profit, acute tertiary medical center and included patients over the age of 18 with the diagnosis of heart failure (HF) or chronic obstructive pulmonary
disease (COPD). In addition, patients had to meet at least one criteria within each of the following three categories: 1) eight or greater scheduled medications at admit OR at least one high-risk-for-error medication (i.e. anticoagulants, diabetic medications, or antibiotic), 2) hospitalization within the past year (11/1/2011 to 2/28/2013) OR new diagnosis of HF or COPD, and 3) length of stay greater than or equal to two days. Exclusion criteria included transfer to another acute care hospital or transition to comfort care. Qualified patients were followed from admission to discharge and interviewed to assess for financial and/or social barriers to medication adherence; social work was consulted if needed. On day of discharge, a pharmacist reviewed the discharge medication orders and contacted the prescriber as appropriate for discrepancies and interventions to optimize therapy. Patients were provided with a customized discharge medication chart with instructions on why and how to take their medications. Counseling on key medications and any changes that were made to the prior-to-admission medication list were also provided. Readmissions were assessed at 31 days after discharge date. Primary endpoints included the total number of pharmacist interventions on discrepancies associated with the discharge medication list and 30-day readmission rates. Secondary endpoints included time for pharmacist to complete discharge review and interventions, rate of intervention acceptance, and estimated cost avoidance associated with the interventions.

Results and Conclusion: to be presented upon project completion

ACPE #:0126-9999-13-215-L01-P

Learning Objectives:
- List the common medication errors that occur during the discharge medication reconciliation process.
- Describe the potential impact of pharmacist interventions on 30-day readmission rates.


**206 - THE EVALUATION OF METHADONE INDUCED QTC PROLONGATION IN A VETERAN POPULATION (EMQIP)**

C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Chelsie Heesch, PharmD
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*Presenting on Tuesday, May 14 at 10:00 AM in Palm II*

INTRODUCTION: This work is supported by the resources of the Southern Arizona Health Care System (SAVAHCS) Tucson, Arizona. The FDA has issued a patient safety warnings regarding QTc prolongation with methadone. The current literature is limited by the lack of large, prospective, randomized controlled studies of the QTc prolonging effects of methadone when used for pain. Additionally, the presence of a dose response relationship with QTc prolongation remains unclear and whether drug interactions play a clinically significant role. The purpose of this study is to evaluate whether methadone prolongs the QTc interval in a Veteran population, whether the drug effects are dose dependent, and whether additional QTc prolongation occurs when methadone is used concurrently with other drugs, which are known to prolong the QTc interval or with drugs which are strong inhibitors of clearance. The findings of this study will help health care institutions and clinicians develop monitoring strategies for the safe use of methadone.

METHODS: This historical prospective cohort study will utilize the electronic medical records of SAVAHCS to compare the QTc interval of patients on stable doses of methadone to the baseline QTc interval. Patients
included in the study will be aged 18-87 years old who were dispensed a new prescription for methadone between January 1, 2006 and July 31, 2010 and were adherent to drug therapy as defined by a mean possession ratio ≥ 0.8. Information that will be obtained are patient demographics (age at the time of the ECG and gender), QTc interval before starting methadone, the initial methadone dose prescribed, the QTc interval recorded while on methadone, time elapsed between QTc interval measurements, time elapsed between starting methadone and the second QTc interval recorded, daily methadone dose at the time of the most recent ECG, highest daily dose of methadone prescribed, and the name of concurrent QTc prolonging medications and medications that inhibit methadone clearance used at the time of the each ECG. Exclusion criteria include patients without a baseline ECG within the 18 months prior to starting methadone and at least one follow-up ECG 7 days to two years after drug initiation, patients with a diagnosis of heart failure, or use of a cardiac device. For the primary endpoint, the mean QTc interval before and during methadone use will be compared. Secondary outcomes are to determine whether methadone induced QTc interval prolongation is dose dependent by comparing the mean QTc interval change from baseline in patients receiving high (>30 mg), medium (>15 mg to ≤30 mg) and low (≤15 mg) daily doses of methadone, to determine the effect of the concurrent use of QTc prolonging medications with methadone, and to determine the effect of concurrent use of inhibitors of drug clearance on the QTc interval. The primary endpoint will be compared using a paired t-test and secondary endpoints will be analyzed using descriptive statistics or McNamara’s test.

RESULTS AND CONCLUSIONS: Will be presented.

ACPE #:0126-9999-13-216-L01-P
Learning Objectives:
- Explain the clinical significance of QTc prolongation.
- Describe the impact of methadone on the QTc interval of patients using methadone for pain.


207 - IMPROVING PATIENT SAFETY THROUGH IMPLEMENTATION OF A HOSPITAL POLICY TO REDUCE THE USE OF HIGH-DOSE IV HYDROMORPHONE
B4. General Clinical Practice

Presented by:
Jillian Hendershot, PharmD
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Presenting on Tuesday, May 14 at 8:30 AM in Royal IV

Introduction: Intravenous (IV) hydromorphone is a common medication used to treat severe, acute pain throughout the inpatient hospital setting. However, it has been identified as a high-risk opioid associated with medication errors that pose risks to patient safety. Dosing errors involving high doses of opioids can have significant consequences, including severe respiratory depression and death. Additionally, many patient-specific factors can increase the risk of opioid-induced respiratory depression. Lack of knowledge and understanding of these risk factors and dosing differences between the opioids may contribute to the prevalence of adverse events associated with use of IV hydromorphone. The goal of this project is to reduce the number of orders for intravenous hydromorphone greater than 1mg in order to improve patient safety.

Methodology: The pharmacy management team at St. Joseph Medical Center composed a formal policy regarding the use of IV hydromorphone which outlines a maximum initial dose limitation. It requires that for all
orders written for hydromorphone IV greater than 1mg, prior to order entry, the pharmacist shall have a
discussion with the provider regarding the appropriateness of the dose.
Prior to policy implementation, the electronic database was queried for all orders entered for IV
hydromorphone greater than 1mg for the previous 90 days. The policy was then implemented. After 60 days of
pharmacist interventions have elapsed, the electronic database will again be queried for all orders for IV
hydromorphone greater than 1mg. The average number of orders per day after the pharmacy-led intervention
will then be compared to the average number of orders per day entered prior to intervention. This project is
exempt from approval by the Institutional Review Board as it has been determined to be a performance
improvement initiative. The results of the data will be presented and discussed.

ACPE #:0126-9999-13-217-L05-P
Learning Objectives:
  Calculate an equi-analgesic dose of intravenous hydromorphone when converting from intravenous
morphine.
  List patient-specific factors that may increase an individual’s risk for respiratory depression when using
opioid analgesics.


208 - REVIEW OF POST RAPID-SEQUENCE-INTUBATION ANALGESIA AND SEDATION
PRACTICES IN INTUBATED PATIENTS IN THE EMERGENCY DEPARTMENT
B3. Critical Care

Presented by:

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Presenting on Wednesday, May 15 at 8:30 AM in Executive 715

Patients requiring endotracheal intubation and mechanical ventilation in the emergency department (ED) are in
critical condition, often with associated pain and distress. Relieving anxiety and pain in these patients can be
difficult, as they may not be able to communicate effectively secondary to their medical condition. Importantly,
if a long-acting paralytic is administered to facilitate intubation, a patient will not be able to gesture or move to
indicate they are suffering. Inadequate anxiolysis and analgesia can result in patient awareness while intubated,
which can be physically and emotionally distressing.
Post-intubation sedation is typically used to prevent awareness, facilitate care, reduce oxygen consumption,
provide analgesia, and manage intracranial pressure in patients with a head injury. Inadequate sedation and
analgesia can lead to adverse outcomes, including unplanned extubation, loss of venous catheters, agitation,
difficulty with ventilation, barotrauma, hypertension, myocardial ischemia, hypermetabolic states, anxiety,
delirium, intracranial hypertension, and hypoxemia, all of which may lead to poor clinical outcomes. Paralyzed
intubated patients who remain awake or inadequately sedated may also experience long-term emotional and
psychiatric disturbances. Previous studies have demonstrated alarming rates of inadequate analgesia and
sedation post-intubation in ED patients, though overall this remains an understudied topic.
The primary objective of this study is to evaluate the frequency of inadequate post-intubation anxiolysis and
analgesia in UCSF emergency department ED patients undergoing endotracheal intubation.
Methods:
This was a single center retrospective chart review of all consecutive adult patients intubated in the ED between January 2008 and January 2012. Intubated patients were identified using hospital’s billing records. The data collected includes ED triage time, induction and paralytic drug choices and doses, sedative and analgesic drug administration times, and ED exit time. The time intervals will be analyzed and compared to pharmacokinetic profiles of administered agents. Time-profiles and dosing will be evaluated using a priori definition of adequate analgesia and sedation. Adequacy of analgesia is defined as a minimum dose of fentanyl of 35 μg/h or equivalent analgesic using standard opioid conversion, whereas adequate sedation is defined as a minimum dose of midazolam of 4.2 mg/h. The study was approved by the institutional review board.

Results:
There were 592 patients who were intubated during the study period. Data collection is on-going, with analysis and conclusions pending.

ACPE #:0126-9999-13-218-L01-P
Learning Objectives:
- Explain the pharmacological management of endotracheal intubation in the ED
- Describe the pharmacokinetics and contraindications of most common post RSI agents


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209 - CLINICAL PHARMACISTS IN THE PATIENT CENTERED MEDICAL HOME: EVALUATION OF POTENTIAL IMPACT AMONG HYPERCHOLESTEROLEMIC AND DIABETIC PATIENTS AT NAVAL HOSPITAL CAMP PENDLETON

Presented by:
Ashley Hetro, PharmD
Naval Hospital Camp Pendleton
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Presenting on Tuesday, May 14 at 10:30 AM in Royal I

BACKGROUND AND OBJECTIVES
Navy Medicine has a model of care referred to as the Medical Home Port, which is synonymous to the Patient Centered Medical Home seen in other areas of practice outside the Department of Defense. In this model, clinical pharmacists are integrated members of the multi-disciplinary team. They are readily available to take immediate questions from providers and nurses, assist with drug selection and dosing, and conduct direct patient counseling and medication therapy management pertaining to complex medical conditions. The current study will evaluate the impact of clinical pharmacists in the Medical Home Port clinics at a military treatment facility, where challenging control of conditions like diabetes is the basis for pharmacist referral. This study will qualify the effects of pharmacists as they have been integrated in this clinical model.

METHODS
A retrospective review of electronic medical records will be conducted of patients who were referred to the clinical pharmacist for support in control of diabetes or hypercholesterolemia and received care between 01 Mar 2012 and 31 Aug 2012 at Naval Hospital Camp Pendleton. We will evaluate changes in low-density lipoprotein cholesterol levels between the point of referral and six months after referral, for all hypercholesterolemic and diabetic patients, and evaluate changes in average glycosylated-hemoglobin (HbA1c) between the point of referral and six months after referral for diabetic patients. The overall changes will be
quantified as well as the proportion of patients meeting the Healthcare Effectiveness Data and Information Set (HEDIS) goals. As a secondary outcome, we will evaluate the amount of time pharmacists spent with patients during clinic visits to see if more time spent with patients is related to the degree of success or change in laboratory values.

RESULTS
A total of 151 patient charts were included for review and consideration of eligibility criteria. Results will be presented upon completion of data collection and analysis.

CONCLUSIONS AND RELEVANCE
Conclusion of this study will also be presented upon completion of the data collection and analysis. Results may be valuable to other healthcare systems that are considering a role for pharmacists in their clinics.

ACPE #:0126-9999-13-219-L01-P
Learning Objectives:
- Explain the role of a clinical pharmacist in the Patient Centered Medical Home.
- Describe the impact pharmacists may have on A1C and LDL control in patients with diabetes and hypercholesterolemia.


210 - COMPARISON OF SHORTENED VERSUS EXTENDED CARBOPLATIN DESENSITIZATION PROTOCOLS
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Tuesday, May 14 at 11:00 AM in Sunset I

PURPOSE: With the increased use of carboplatin in ovarian carcinomas, and other cancers, it is evident that prolonged use of carboplatin increases the risk of hypersensitivity reactions (HR) for patients. Desensitization protocols can be lengthy and dissatisfying for patients and can lead to increased costs for the institution. The primary objective of this study is to assess the HR rate of the previously utilized extended carboplatin desensitization protocol and compare this to the rate of reactions observed with the newly implemented shortened carboplatin desensitization protocol. Secondary objectives include assessing patient time in infusion chair with each protocol; assessing pharmacy time to prepare drug for each protocol; identifying potential institutional cost savings with the new protocol in regards to infusion chair time and pharmacy resources; and assessing amount of pre-medications, specifically corticosteroid doses, administered for each protocol.

METHODS: This study is a retrospective chart review with a prospective observational component for quality improvement purposes. Institutional Review Board approval was obtained prior to initiation of the study. Women older than 18 years of age diagnosed with ovarian cancer, who have undergone carboplatin desensitization with either protocol, will be identified using data from the health system’s electronic medical record (EMR), the institution’s scheduling system, and the pharmacy billing system between January 2002 and May 2013. The data to be collected will include: patient age, sex, height, weight, body surface area, diagnosis (stage of ovarian cancer), co-morbidities, immunologic history, infusion chair time for desensitization, prior platinum therapy, HR reaction (type and severity grade), amount of carboplatin received and number of
carboplatin doses received before HR, number of cycles of carboplatin received after desensitization, premedication doses of corticosteroids and histamine antagonists, and preparation time in pharmacy of carboplatin for both desensitization protocols. All data will be collected from the EMR and recorded into a secure database. Data analysis will be performed by all study investigators. A Student’s t-test will be performed to analyze the primary endpoint. Descriptive statistics will be used to compare baseline characteristics and analyze secondary endpoints. The percentage of patients who had an HR in different sub-categories will also be calculated (i.e. receiving x mg of corticosteroids). The shortened desensitization protocol was implemented on January 1, 2013 with approval from the medical staff. Prior to the implementation, pharmacy and nursing staff, as well as providers, were educated on the new shortened desensitization protocol.

RESULTS/CONCLUSION: Results and conclusions pending completion of data collection.

ACPE #:0126-9999-13-220-L01-P
Learning Objectives:
- Describe the features of the hypersensitivity reactions associated with carboplatin.
- List the differences between the shortened and extended carboplatin desensitization protocols and the potential benefits of utilizing a shortened protocol.


211 - INCIDENCE OF HOSPITALIZATION FOR FEBRILE NEUTROPENIA IN PATIENTS RECEIVING SELECT CHEMOTHERAPEUTIC REGIMENS BEFORE AND AFTER IMPLEMENTATION OF A G-CSF ORDER ALERT

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Tuesday, May 14 at 11:30 AM in Sunset I

Introduction: Prior to 2007, National Comprehensive Cancer Network (NCCN) guideline recommendations for use of growth colony stimulating factors (G-CSF) targeted regimens with a >40% known incidence of febrile neutropenia. Emerging evidence in 2005 showed efficacy for CSFs in reducing febrile neutropenia rates when the risk was as low as 20%. This finding prompted a revised recommendation for CSF prescribing from the American Society of Clinical Oncology (ASCO) in 2006. In 2007, the NCCN guidelines were updated to reflect this by recommending use of CSFs in regimens with a known incidence of febrile neutropenia that was >20%. In response to these changes in guideline recommendations, the VA San Diego Healthcare System (VASDHS) implemented a pop-up alert with chemotherapeutic regimens that had a >20% incidence of febrile neutropenia. These order sets, which included components such as hydration and pre-medications, now also included CSFs when appropriate. The intent of this was to encourage compliance with NCCN guideline recommendations and to reduce the incidence of hospitalization for febrile neutropenia within the VASDHS. This study will assess the impact of this order alert implementation.

Objectives: To determine whether a pharmacy-initiated pop-up for G-CSF use reduces incidence of febrile neutropenia at the VASDHS. Secondarily, this study will assess the incidence of dose reductions, secondary prophylaxis, and death prior to and following implementation of the alert.

Study Design: Retrospective cohort study.
Methods: All cancer patients receiving chemotherapeutic regimens with a known >20% incidence of febrile neutropenia 2 years before (March 2005- February 2007) and 5 years after (April 2007- March 2012) the implementation of a G-CSF order alert will be included in this study (a sample of convenience). Patients will be matched for age, chemotherapy received, and cancer type. Patients will be assessed through chart review for a primary outcome of hospitalization for febrile neutropenia within 28 days of chemotherapy completion. A relative risk reduction will be scored between the two study groups for statistical analysis.

Results and Conclusion: Results may contribute to showing the impact of pharmacist initiated protocols and a reduced incidence of febrile neutropenia in the VASDHS. Will be presented.

ACPE #:0126-9999-13-221-L01-P

Learning Objectives:
1) Describe how guideline adherence can lead to positive patient outcomes
2) Explain the impact of pharmacist initiated protocols


212 - IMPROVING PATIENT SATISFACTION AND HCAHPS SCORES THROUGH MEDICATION EDUCATION DURING HOSPITAL ADMISSION

B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 9:00 AM in Royal IV

Introduction: Hospital reimbursement is moving in a direction that is patient centered. Patient satisfaction is measured through surveys that are filled out after discharge. Within this survey is a section regarding the information patients received about medications that were being administered to them while in the hospital. Evaluation of past survey scores revealed that 57% of patients admitted to our hospital indicated on their survey that they were not told what side effects to expect prior to administration and 30% indicated that they were not told what their medication was treating. The purpose of this project is to improve patient satisfaction by increasing medication use awareness during our patient’s hospital stay. This project will develop, implement and evaluate new techniques and processes aimed at improving patient satisfaction related to medication education.

Methodology: This project was conducted in three phases. Phase one took place from October 8, 2012 through October 26, 2012 on the Cardiology unit and was carried out by a resident. The purpose of this phase was to develop a process for a student to discuss new medications with admitted patients. During this phase, patients were randomly selected for intervention. Current medications were compared to patient reported home medications. Bedside consultation was conducted for each of these patients regarding indication and adverse reactions for new scheduled medications. Patients were also told they had as needed medications available to them and those medications were briefly gone over. Phase two took place from November 5, 2012 through December 15, 2012 for all patients admitted to the Internal Medicine Residency service. During this phase, a medication reconciliation component was added. Also, a patient education sheet was provided to the patient for at least one new medication. Time to conduct bedside consultations was also recorded. A resident performed these tasks for most patients and assigned two to three patients to a pharmacy student who
provided feedback on their ability to perform the assigned tasks in addition to their student workload. Patient reported home medications were printed and verified with the patient’s outpatient pharmacy. Current hospital medications were compared to the reconciled home medication list then bedside consultation was conducted as described in Phase one. Phase three took place from January 7, 2013 through February 8, 2013 on the medical pulmonology unit. The purpose of this phase was to determine sustainability of providing this service to patients by pharmacy students. During this phase, one pharmacy student repeated the steps outlined for phase two for all patients in one patient care unit consisting of 30 beds. During each phase, patients were contacted by phone following discharge and asked to participate in a 2 question survey regarding medication knowledge while they were admitted to Providence Sacred Heart Medical Center.

Results: Details of process followed, time requirements, patient feedback, future plans, and HCAPS scores will be presented.

Conclusion: To be presented.

ACPE #:0126-9999-13-222-L01-P

Learning Objectives:
1. Explain the steps necessary to implement medication education in a large hospital utilizing pharmacy students
2. Describe the challenges that come with bedside medication consultation during hospital admission


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213 - EVALUATION OF A PHARMACY DEVELOPED TETANUS, DIPHTHERIA, AND ACELLULAR PERTUSSIS (TDAP) VACCINATION COCOONING PROGRAM

B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 9:30 AM in Royal IV

Introduction: In an effort to provide newborns protection from pertussis by vaccinating those persons who have or anticipate having close contact with the infant (i.e. cocooning), visitors to the Mom/Baby Unit at Denver Health Medical Center (DHMC) are given a voucher informing them of the opportunity to receive a free or low cost Tdap vaccination at the Denver Public Health (DPH) Immunization Clinic available Monday through Friday. However, this requires after hour visitors to return to DPH during hours of operation, which infrequently occurs. With over 1,000 reported cases of pertussis in Colorado this year, more cases reported than in the previous 3 years combined, the inpatient pharmacy has partnered with nursing to implement a Tdap cocooning program by having pharmacy interns administer Tdap vaccinations to individuals visiting the Mom/Baby Unit when DPH is closed. The purpose of this study is to evaluate the impact of an inpatient pharmacy developed Tdap vaccination program on the rate of immunizations provided to the individuals visiting the Mom/Baby Unit at a large, academic medical center primarily servicing low income and indigent patients in a metropolitan area.

Methods: This is a program evaluation of visitors 10 years of age and older visiting the DHMC Mom/Baby Unit from October 20, 2012 through April 30, 2013 that receive a Tdap vaccination. Baseline demographic
Information will be collected utilizing security check-in logs. Information for the visitors that receive a vaccination by pharmacy will be collected from immunization consent forms. The primary outcome is the number of visitors that are vaccinated compared to the total number of visitors that come to the Mom/Baby Unit. Secondary outcomes include the proportion of visitors who have already received a Tdap vaccination, stratification of Tdap vaccine recipients by age, primary language, female versus male visitors that receive a Tdap vaccination, self-reported relationship to the post-partum mother, results of the program’s quality improvement survey, and the economic impact of the program.

Results/Conclusions: Pending study evaluation. To be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-223-L01-P

Learning Objectives:

- Describe advantages and barriers of a pharmacy developed Tdap vaccination program.
- Describe cocooning and how it is achieved.


**214 - EVALUATION OF CLOPIDOGREL VERSUS PRASUGREL PRESCRIBING HABITS IN REINFARCTION AND BLEEDING RATES IN POST MYOCARDIAL INFARCTION WITH PERCUTANEOUS CORONARY INTERVENTION PATIENTS**

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

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Presenting on Tuesday, May 14 at 3:00 PM in Royal V

Introduction: P2Y12 inhibitors such as prasugrel and clopidogrel are indicated for myocardial infarction patients with percutaneous coronary interventions with stenting for risk reduction of subsequent cardiovascular thrombosis. Studies have shown prasugrel decreased recurrent events compared to clopidogrel in STEMI with PCI patients, but no difference in medically managed NSTEMI patients. Prasugrel, however, is limited by stroke/TIA contraindications and shown to have increased rates of bleeding compared to clopidogrel in certain populations. This study sought to identify bleeding and reinfarction rates between clopidogrel and prasugrel and other potential factors affecting these outcomes including patient demographics, drug interactions, dosing differences, P2Y12 drug swapping, types of myocardial infarctions, and stents used.

Methodology: Primary diagnosis codes representing myocardial infarction with percutaneous coronary interventions was used to identify subjects from 7/1/2010 to 12/31/12. Within the identified population, data including gender, age, weight, past medical history, P2Y12 agent used for loading and maintenance with doses, initial MI date, type of stent, and site of MI was collected. A retrospective chart review was done for identified patients from the time of diagnosis up to the end of 2012 to identify readmissions for any bleeding episodes and/or recurrent MI episodes. Data collected in the recurrent MI and bleeding patients included type of recurrent MI, date and type of bleed, use of PPIs, and anticoagulant, antiplatelet, and other potential bleeding agents used. Gathered data from the two time periods was used to correlate patient readmissions for bleeding and reinfarction. Potential trends and causes affecting outcomes were identified amongst the readmitted patients.

Results: To be presented at the 2013 Western States Conference.
Conclusion: To be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-224-L01-P
Learning Objectives:
  - Describe institution specific rates of bleeding and reinfarction correlated with clopidogrel and prasugrel in post myocardial infarction with percutaneous coronary intervention patients
  - Explain potential causes and trends correlated with bleeding and reinfarction between clopidogrel and prasugrel


215 - THE EFFECT OF A CPOE SYSTEM ON THE APPROPRIATENESS OF VANCOMYCIN DOSING AND TIME TO THERAPEUTIC TROUGH
D1. Medication Safety

Presented by:
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Presenting on Tuesday, May 14 at 3:00 PM in Palm I

Introduction:
Vancomycin is subject to complex pharmacokinetics and pharmacodynamics. It has a narrow therapeutic index, therefore, dosing must be continually evaluated for efficacy versus toxicity. As a result, the complexity of this process has a high potential for errors. Subtherapeutic concentrations are implicated with the emergence of vancomycin resistant organisms, while nephrotoxicity associated with higher trough concentrations remains in debate. Computerized provider-order-entry (CPOE) has the potential to intercept errors at the time vancomycin is ordered. Ordering processes consist of the initiation, adjustment, and monitoring of vancomycin. The benefits of a CPOE system have been well-documented and include decreased medication errors, adverse drug effects, length of stay, and costs. However, little data exist on CPOE’s effect on the management of patients receiving vancomycin.

Objective:
The purpose of this study is to determine the appropriateness of vancomycin level monitoring and time to therapeutic trough before and after implementation of a CPOE system. Secondary endpoints include appropriateness of serum vancomycin levels that are ordered and obtained.

Methodology:
A retrospective, single-center, cohort study comparing pre- and post- CPOE implementation. Patients who received at least four consecutive doses of IV vancomycin during their hospital stay and are at least 18 years of age will be included. Patients who received prophylactic or oral vancomycin, lacked a serum trough concentration, or had no documented height or weight will be excluded. All data will be obtained from our patient data management system (EPIC). The primary endpoint is time to vancomycin trough. Secondary endpoints include appropriateness of serum vancomycin levels ordered and obtained. Continuous data will be analyzed using the t-test for normally distributed data or the Wilcoxon rank-sum test for skewed data. The study is powered to detect a 20% improvement post-CPOE implementation with an anticipated 176 patients per group.

Results:
216 - STRESS ULCER PROPHYLAXIS FOR INTENSIVE CARE UNIT PATIENTS WITH LOW GLASGOW COMA SCALE SCORES

B3. Critical Care

Presented by:
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Presenting on Wednesday, May 15 at 9:00 AM in Executive 715

The 1999 American Society of Health System Pharmacists (ASHP) Guidelines for Stress Ulcer Prophylaxis (SUP) recommend gastric acid suppressants for patients in the intensive care unit with a Glasgow Coma Scale (GCS) less than or equal to 10. No previous studies quantify the association between low GCS scores and risk of stress-induced gastrointestinal bleeding. We conduct a retrospective single center analysis at a 460-bed tertiary care hospital to determine the GCS cutoff below which SUP should be indicated for risk of overt or clinically important bleeding. All subjects admitted to the Neuroscience, Respiratory, and Shock-Trauma Intensive Care Units between January 1, 2009 and September 31, 2012 are evaluated for study enrollment. Subjects with the following criteria are excluded: age < 18, upper gastrointestinal bleeding within 48 hours before or 24 hours after admission, Zollinger-Ellison syndrome, variceal bleeding, or death, discharge, or transfer from the ICU within 24 hours after admission. Overt bleeding is defined as hematemesis, gross blood, or “coffee grounds” material in a nasogastric aspirate, hematochezia, or melena. Clinically important bleeding is defined as overt bleeding complicated by hypotension, tachycardia, or the need for blood transfusion or surgery. A receiver operator characteristic is used to determine the GCS score cutoff which warrants stress ulcer prophylaxis. The odds ratio of GCS, mechanical ventilation, and coagulopathy for clinically important bleeding will be determined using a binomial logistical regression. Results are pending at time of this abstract submission.

ACPE #:0126-9999-13-226-L01-P
Learning Objectives:
1. Identify the Glasgow Coma Scale score cutoff below which stress ulcer prophylaxis should be indicated for risk of overt or clinically important bleeding
2. Compare the odds ratio of Glasgow Coma Scale scores, mechanical ventilation, and coagulopathy on the development of overt bleeding or clinically important bleeding

INTRODUCTION: The Centers for Disease Control and Prevention recommends that all patients greater than the age of six months receive the seasonal influenza vaccine. Due to this recommendation, hospitals are required by The Joint Commission to achieve a vaccination administration rate greater than 90% by 2020. As a result, the Kaiser Permanente Fontana Medical Center modified existing workflow to achieve the requirements established by The Joint Commission. To determine the incremental progress necessary to achieve the 90% goal, this project helped identify opportunities for improvement to ensure our members are being protected from potential influenza infection. A collaborative practice in the inpatient setting has been implemented to increase the rate of influenza vaccine administration in patients who are being discharged from the hospital. The Kaiser Permanente Fontana Inpatient Pharmacy implemented workflow changes in an effort to increase the influenza vaccination rate in the Postpartum Unit. The goal of this study is to evaluate the impact of these changes.

METHODOLOGY: This is a retrospective study that determined the effect of an interdisciplinary workflow on influenza administration to increase the rate of vaccination for postpartum patients prior to hospital discharge. The vaccine rates from the Postpartum Unit from January 1, 2013 to March 31, 2013 were compared to vaccine rates from January 1, 2012 to March 31, 2012. The primary endpoint of this study is the percentage of influenza vaccine given and the secondary endpoint is reviewing the refusal reasons. Inclusion criteria were females age 18 years or older, admitted in the Postpartum Unit, and eligible for influenza vaccine. Patients were excluded from the study if they previously received influenza vaccine for the season, have a severe allergy to chicken eggs, have had a severe reaction to an influenza vaccination, have a moderate-to-severe illness with a fever, and patients with a history of Guillain-Barre Syndrome. A power analysis indicated that for a power of 80%, 94 patients in each arm were necessary to detect a 20% increase in influenza vaccination rate. The data was analyzed using Chi-squared test. A p-value of less than 0.05 is considered statistically significant. The study results and conclusions will be presented.

RESULTS & CONCLUSION: To be presented

ACPE #:0126-9999-13-227-L01-P
Learning Objectives:
- Explain the importance of influenza vaccination prior to hospital discharge.
- Explain the current workflow of influenza vaccination and ways to improve workflow to increase influenza vaccination rate to meet The Joint Commission requirement.

IMPLEMENTATION OF PHARMACIST LED HEART FAILURE DISCHARGE COUNSELING AND MEDICATION THERAPY MANAGEMENT SERVICES

B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 10:30 AM in Royal IV

Background: Hospital readmission rates are receiving increased attention as a measure of the quality of care provided to patients at the hospital. Heart failure is the most frequent reason for readmission to the hospital. Some causes of avoidable readmissions include failure to correctly reconcile medications, lack of communication between the hospital care team and the primary care provider, inadequate patient education regarding their care after discharge, and the patient’s inability to afford the care needed after discharge. Pharmacists are well-suited to address medication discrepancies or problems and resolve them.

Methods: This is a prospective, observational pilot study evaluating the impact of discharge counseling in the hospital and medication therapy management (MTM) after discharge by a pharmacist. The patient population will be heart failure patients stratified as high risk for readmission by the Heart Failure Nurse Navigator using a hospital-approved scorecard. For eligible patients, the pharmacist will provide medication education on all new medications initiated in the hospital by the day of discharge. Within one week after discharge, the patient will be seen in the pharmacist-run medication therapy management clinic for a 60 minute appointment to provide a pharmacotherapy assessment and ensure appropriate medication reconciliation on discharge. The pharmacist will assess the patient’s knowledge about his or her medications and heart failure and provide individualized education on medications and disease states as appropriate. Any medication therapy recommendations or cost savings opportunities will be documented and communicated with the physician. All patients in the study will be followed to see if they are readmitted to the hospital. The study will compare data collected in a retrospective review of similar high risk heart failure patients to data from the patients included in the prospective pilot trial to evaluate the effect of pharmacist services on readmission rates.

Outcomes: The primary outcome is the 30 day readmission rate of patients in the study compared to high risk patients not enrolled in the study. Secondary outcomes are the number and types of medication interventions made in the clinic.

Results: IRB approval has been obtained and data collection is being conducted. Study results and conclusions will be presented.

ACPE #:0126-9999-13-228-L01-P

Learning Objectives:

- Describe the effect of pharmacist interventions at the transition between inpatient and outpatient care on patient readmission and appropriate medication reconciliation.
- List risk factors associated with heart failure readmission.

219 - EVALUATING THE OUTCOMES OF APPENDICITIS PATIENTS IN A PEDIATRIC INSTITUTION TREATED WITH VARYING ANTIBIOTIC REGIMENS
B6. Pediatric or Gender Specific Care

Presented by:

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Presenting on Tuesday, May 14 at 4:30 PM in Sunset II

Introduction: Appendicitis is the most common surgical emergency and abdominal presentation in the pediatric population. At our institution alone, the number of appendicitis cases has consistently increased over the past decade (207 patients in 2004 to 402 cases in 2011). The current best-practice recommendations suggest treating non-perforated appendicitis patients with preoperative, broad-spectrum antibiotics. The same recommendations suggest treating perforated appendicitis patients who undergo appendectomy with both pre-operative and post-operative broad-spectrum single or double agent therapy. Several studies completed in the pediatric population have suggested that monotherapy or dual therapy with antibiotics active against the most common bacterial pathogens have been as effective and less costly compared to more cumbersome antibiotic regimens. In recent literature published by St. Peter, et al., an attractive antibiotic regimen described to be equally effective and less costly has been once daily ceftriaxone and metronidazole. Given this data, our institution’s clinical care guideline was modified from cefoxitin use in non-perforated patients and ertapenem use in perforated patients to once daily ceftriaxone and metronidazole for both non-perforated and perforated appendicitis patients. The specific aims of this study are to (1) assess the effectiveness of ceftriaxone and metronidazole dual therapy in terms of length of stay and fever curve outcomes compared to cefoxitin and ertapenem monotherapy in non-perforated and perforated appendicitis patients, respectively and (2) further determine the cost-effectiveness and clinical outcomes of ceftriaxone and metronidazole dual therapy compared to monotherapy in both non-perforated and perforated patients through monitoring of antibiotic cost and readmissions within 30 days for complications (abscesses, wound infection, Clostridium difficile, line infection, or line complications).

Methodology: This study is a retrospective review evaluating inpatients diagnosed with appendicitis who underwent an appendectomy in November 2010 through November 2012. Patients were included if they (1) underwent an open or laparoscopic appendectomy between November 2010 and November 2012 and received an appendicitis diagnosis based on ICD9 codes, and (2) were treated at the main campus of our institution according to the newly instituted (ceftriaxone/metronidazole) or historic (cefoxitin or ertapenem) appendicitis clinical care guideline. Patients were excluded if they (1) were transferred to an outside facility following appendectomy, (2) had an abscess at presentation, (3) were undergoing an interval appendectomy, (4) had an incidental appendectomy or negative findings for appendicitis, (5) were treated at one of our institution’s network of care sites, (6) were admitted or transferred to an intensive care unit, or (7) had chronic medical conditions that would complicate recovery outcomes.

Results and Conclusion: Data will be collected through chart review and will include patient specific characteristics and clinical data. Descriptive statistics will be performed on all data collected. It is the goal of this study to describe the efficacy and cost differences between the previous and current clinical care guidelines, and ultimately reinforce the use of once daily metronidazole in this patient population.

ACPE #:0126-9999-13-229-L01-P

Learning Objectives:

Describe the pharmacokinetic properties of metronidazole that support once daily dosing.
List two advantages of once daily ceftriaxone and metronidazole for perforated and non-perforated appendicitis patients.


220 - IMPLEMENTATION OF A PHARMACIST-RUN PERTUSSIS VACCINATION CLINIC AT A COMMUNITY HOSPITAL
A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Tuesday, May 14 at 9:30 AM in Mission Bay

Introduction:
Pertussis, also known as whooping cough, is a highly contagious disease that has been steadily increasing nationwide. The state of Utah represents one of eighteen states that have experienced a significant rise in pertussis cases, well above the national incidence. The most serious cases are occurring in young infants under 12 months of age and especially those under 6 months who are too young to be immunized. In many cases, the infant’s own family members (e.g., mother, father, grandparents) or close family contacts are the source of the pertussis infection. Due to the waning of immunity provided by the childhood immunizations, the CDC is now recommending a one-time adult pertussis booster (Tdap) for all adults. In addition, the CDC also recommends that women receive the Tdap booster with every pregnancy or immediately postpartum in order to pass the protective antibodies on to the baby. The purpose of this study is to increase awareness of pertussis immunizations and improve pertussis vaccine acceptance rates among mothers, fathers, and close family contacts of infants.

Methodology:
A pharmacist-run pertussis vaccination clinic was implemented within the Mother/Baby unit at Utah Valley Regional Medical Center, a 395 bed community hospital in the Intermountain Healthcare system with over 4,000 deliveries each year. A series of meetings were held over a period of approximately four months in order to establish the new clinic service. An initial meeting was held with the medical director of the local health department in order to better understand the impact of the pertussis outbreak in the community. Nursing management within the Mother/Baby unit was consulted in order to ensure appropriate incorporation of the clinic service into the current workflow. Meeting with financial representatives and billing staff were then carried out to establish appropriate processes for enrolling and billing patients in the clinic. The clinic ultimately received approval from the regional Infection Prevention Committee, the hospital’s Administrative Council, and the local Pharmacy and Therapeutics Committee to operate as an independent clinic. Pharmacists practicing in this unit obtained immunization certification to participate in a vaccine collaborative practice agreement in accordance with the Utah State Pharmacy Practice Act. The collaborative practice agreement with the hospital’s pediatric infectious disease physician allows pharmacists to independently round on patients and family members/visitors and administer Tdap to eligible individuals. Individuals not eligible to receive Tdap were excluded from this prospective study. Education via in-service presentations, posters, and handouts were provided to all parties involved. All Tdap immunizations administered in the clinic were documented on the Utah Statewide Immunization Information System (USIIS), the state’s online immunization recording system for...
Utah residents of all ages. After approximately three months of operation, a retrospective component will be introduced in order to measure the impact of the clinic.

Results and Conclusion: To be presented.

ACPE #:0126-9999-13-230-L01-P

Learning Objectives:

- Explain the importance of the Tdap booster to “cocoon” infants and protect them against pertussis.
- Discuss how pharmacists can improve Tdap vaccination rates among mothers, family members, and close family contacts of infants in the hospital setting.


221 - COMPARISON OF THE COMORBIDITY-POLYPHARMACY SCORE (CPS) IN PREDICTING MORTALITY WITH OTHER SCORING SYSTEMS IN ELDERLY TRAUMA PATIENTS AT HARBORVIEW MEDICAL CENTER

B3. Critical Care

Presented by:

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Presenting on Wednesday, May 15 at 10:30 AM in Executive 715

BACKGROUND

Harborview Medical Center is a 413 bed, level 1 regional trauma center in Seattle. Previous studies have shown an association between comorbidity and polypharmacy with trauma triage in patients >45 years old. The CPS assigns a point to each chronic health condition and each medication that a patient takes for that condition. For instance, if a patient takes two medications for hypertension and three medications for diabetes they would have a CPS of seven. The Charlson score was developed in 1987 and assigns weights between one and six to 22 different medical conditions, with six being the most severe. It has been validated in predicting mortality in patients with those conditions, but not specifically in trauma. The Injury Severity Score (ISS) assigns between one and six point to each injury in a body system, with six being the most severe. The top three injuries are squared and the points are added together. The ISS ranges from zero to 75, with 75 being the most critical. It has been used to predict mortality in trauma patients and has been validated in this setting.

OBJECTIVE

To determine whether the CPS predicts one-year mortality more accurately than the Charlson score. The secondary objective is to evaluate if combining and the CPS the ISS is a better predictor of one-year mortality than ISS alone.

METHODS

The Harborview Trauma Registry was searched for patients who were residents of Washington State, >55 years old, and admitted to the ICU in 2010 due to trauma. Patients were excluded if their injury was >48 hours before admission. Chart review was completed on all patients meeting inclusion criteria for home medications and past medical history at the time of admission. CPS and Charlson score were calculated based on information collected during chart review and the ISS was obtained from the trauma registry. Mortality data was obtained from the Washington State Department of Health for 2010 and 2011. These lists were cross-checked with the list of
patients obtained from the trauma registry to determine how many patients expired within one year of their trauma. This study has approval from the UW Medicine institutional review board.

RESULTS AND CONCLUSION
The findings of this study will be presented.

ACPE #:0126-9999-13-231-L01-P
Learning Objectives:
1. Define the comorbidity-polypharmacy score.
2. Identify which score best predicts one-year mortality in trauma patients >55.


222 - HOW SMART CAN WE BE? MAXIMIZING THE USE OF SMART PUMP INFUSION DATA TO PROMOTE SAFER PUMP SETTINGS
D1. Medication Safety

Presented by:
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Presenting on Tuesday, May 14 at 4:00 PM in Palm I

Purpose: The intravenous (IV) route is the most common method of medication delivery in the hospitalized patient. It is also one of the most dangerous routes of administration with 60% of life-threatening errors occurring during the administration process. The Institute for Safe Medication Practices (ISMP) recommends a defined process be in place when programming or making changes to any smart pump technology. Despite these recommendations, no defined process for programming or adjusting smart pump libraries has been established. Smart pumps hold a robust amount of data that can help guide quality improvement efforts to adjust program settings, educate hospital staff on drug-specific or unit-specific issues, and optimize the information programmed into drug libraries. This project establishes a process for formal review of ALARIS® pump profiles and utilizes pump specific summaries in a more meaningful way to optimize patient care. University of Utah Hospitals and Clinics (UUHC) strives to apply information technology to its full potential to provide the highest level of patient care across its 3 hospitals, specialty clinics, and infusion centers. This is a single-center, descriptive study with the primary objective to develop a standard approach for programming ALARIS® smart pump Guardrails®. Secondary objectives assess if Guardrails® already set in ALARIS® smart pumps reflect what is done in clinical practice and to properly adjust these settings if needed using the standardized approach.

Methodology: An algorithm was developed to proactively identify potential changes to existing products in the ALARIS® pump libraries and critically evaluate new medications being added to the formulary. Information from the 7 different ALARIS® pump profiles used at UUHC were assessed. The project was narrowed by utilizing reports provided by CareFusion to establish what medications should be evaluated more closely (eg, top 10 overrides). Additional assessment was made to determine if current Guardrails® were set correctly to reflect the needs of specific patient care areas. The data was used to help develop a systematic approach for programming Guardrails® for newly added formulary medications and for evaluating medications already programmed in ALARIS® pump drug libraries.

Results/Conclusion: Final conclusions are pending based on evaluation of collected data.
ACPE #:0126-9999-13-232-L01-P

Learning Objectives:
- Identify potential variations in the medication acquisition process that can impact current smart pump settings.
- Explain how a proactive process for evaluating smart pump settings can create a more meaningful alert system to reduce medication administration errors.


223 - RISK FACTORS ASSOCIATED WITH VANCOMYCIN NEPHROTOXICITY ACROSS DIFFERENT ACUITY LEVELS OF CARE

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Tuesday, May 14 at 10:00 AM in Mission Bay

Vancomycin (VAN) has long been accepted as the standard of therapy for methicillin-resistant Staphylococcus aureus (MRSA) infections despite reported treatment failures in invasive infections caused by MRSA isolates demonstrating tolerance, and those with minimum inhibitory concentrations at the upper end of the susceptibility range. Higher therapeutic VAN troughs of 15-20 µg/mL have been advocated for various invasive infections. However, this change in practice has come with a cost of increased adverse effects, specifically, nephrotoxicity. Previous studies have identified various risk factors for vancomycin-associated nephrotoxicity, but are confounded by the acuity of illness and concomitant administration of nephrotoxic agents. Thus, we set out to compare the incidence of nephrotoxicity associated with vancomycin use across different acuity levels of care (inpatient intensive care unit, inpatient non-intensive care unit, outpatient infusion) and determine the risk factors associated with vancomycin nephrotoxicity in those respective settings.

A retrospective chart review is being conducted at St. Joseph Hospital of Orange for qualified patients admitted from January 2012 through December 2012. Inclusion criteria: 1) >17 years old, 2) infection caused by MRSA, 3) received intravenous vancomycin for 3 or more days, and 4) at least one vancomycin trough available prior to onset of nephrotoxicity. Exclusion criteria: end-stage renal disease prior to receipt of vancomycin. The primary outcome measure is the incidence of nephrotoxicity using the traditional definition previously reported in literature and the Acute Kidney Injury Network definition.

Continuous data will be reported as mean +/- standard deviation or median values with interquartile range. Frequency and percentages will be used to describe discrete data. Test for normality will be performed using the Shapiro-Wilk’s test for continuous data. Two-group comparisons of continuous data will be performed using Student’s t-test and Mann-Whitney U test where appropriate. Two group comparisons of discrete data will be performed using Pearson’s chi-squared test and Fisher’s exact test where appropriate. Univariate analysis will be performed to identify variables to include into a logistic regression analysis for the primary clinical outcomes. Mutivariate regression models will be constructed to identify baseline variables predictive of the outcomes of interest while controlling for other factors beyond our control. Independent variables with a p<0.10 will be considered for inclusion. Two-tailed statistical significance will be defined a priori as p<0.05. All statistical analysis will be performed using SPSS v 15.0.
Results and conclusions will be presented.

ACPE #:0126-9999-13-233-L01-P

Learning Objectives:
- Describe the incidence of nephrotoxicity across different acuity levels of care.
- Describe risk factors associated with vancomycin nephrotoxicity across different acuity levels of care.


224 - IMPROVING VIRGINIA MASON MEDICAL CENTER’S DRUG RECALL PROCESS UTILIZING LEAN METHODOLOGY
D1. Medication Safety

Presented by:
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Presenting on Tuesday, May 14 at 3:30 PM in Palm I

Introduction: On April 25, 2012, Congress passed the Drug Safety and Accountability Act, which increased FDA’s oversight on pharmaceutical industry’s safe and effective manufacturing as a measure to decrease defects. With decreased defects, a subsequent benefit is a reduction in drug recalls. However, hundreds of drug lots are continually recalled on an annual basis by the FDA and/or manufacturers. Recalls are stratified into different risk and response categories, but all require some level of assessment in a timely manner.

Recently, media worthy attention as well as internal events have shed light on the complicated system of drug recalls and the potential for errors, risks and confusion to patients. In the last year, VMMC did not address a typhoid drug recall in a timely manner which prompted an internal patient safety alert. While patients were not harmed by this error, it does reveal the urgency to address our drug recall process. While this issue is being addressed on a national level, there is ambiguity regarding how health systems should approach recalls. The goal for this project is to create reliable standardized work allowing multiple employees efficiently manage drug recalls, create accountability for the key parties involved and to incorporate technology for ease of record keeping.

Methodology: A background literature and information search was performed to gather regulatory requirements and identify best practice examples. Assessment of the current process includes gathering information from the pharmacy purchasing team, discussions with the wholesaler and investigating current tools and technology available. Target groups will include inpatient pharmacy, outpatient infusion center, ambulatory pharmacies and satellite clinics. Multiple defects have been identified including lack of a formal process in managing drug recalls, unclear communication to providers, and a nonstandard method of documenting drug recalls. Specific targets have been identified for improvement, including the percentage of drug recalls documented as well as the length of time required to address a drug recall. The project will incorporate lean management tools and will conduct a formal process improvement event to further identify wastes within the drug recall process for the inpatient pharmacy and to generate ideas in efficiently handling a drug recall. After the event, the new process will be put into action and targets will be reevaluated.

Results and Conclusion: To be presented and discussed

ACPE #:0126-9999-13-234-L01-P

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Learning Objectives:
   - Identify defects in a drug recall process within a health care system.
   - Explain how lean management tools can be utilized to create an efficient and standardized drug recall process.


225 - SAFETY AND EFFICACY OF IV BISPHOSPHONATES IN THE PREVENTION OF SKELETAL RELATED EVENT IN PATIENTS WITH MALIGNANCY
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Wednesday, May 15 at 2:30 PM in Sunset I

Introduction: Bone metastases are closely linked to skeletal-related events (SRE) and are common in patients with metastatic breast, prostate and multiple myeloma and can increase overall morbidity and mortality. Use of IV bisphosphonates has shown to significantly reduce both the frequency and severity of developing a SRE. A common toxicity with IV bisphosphonate use is nephrotoxicity, therefore dose adjustments are warranted for patients with impaired renal function, with routine monitoring of serum creatinine as well as electrolytes recommended. A rare, but serious adverse event of bisphosphonates is osteonecrosis of the jaw. It is recommended that all patients receive a comprehensive dental examination prior to initiating treatment.

Purpose: This study is designed to evaluate the efficacy of IV bisphosphonates in prevention of skeletal-related events (SRE) in SAVAHCS patients with malignancy, as well as assess the safety of use in these patients.

Methodology: This study is retrospective chart review designed to evaluate the efficacy of IV bisphosphonates in the prevention of skeletal-related events (SRE) in patients with metastatic breast, prostate and multiple myeloma, as well as assess the safety of use in these patients. Charts were reviewed to examine the incidence of skeletal-related events (SRE) in patients with breast cancer, prostate cancer and multiple myeloma that were given at least 2 consecutive monthly doses of IV bisphosphonates between July 1, 2006- June 30, 2011. Charts were reviewed for documentation of a SRE during the study time frame. The primary efficacy endpoint will be development of a SRE defined as; pathologic fracture, spinal cord compression, radiation therapy to bone, and surgery to bone. Subset analysis will examine incidence based on type of malignancy and time to first SRE. Safety analyses will include information regarding proper dosing based on renal function, and that laboratory monitoring and baseline dental examinations were performed. Results and conclusions will be presented. This material is a result of work supported with resources and the use of the facilities of SAVAHCS in Tucson, AZ.

Results/Conclusions: Pending

ACPE #:0126-9999-13-235-L01-P
Learning Objectives:
   - Explain the role of IV bisphosphonates in the prevention of skeletal related events in patients with breast cancer, prostate cancer and multiple myeloma.
   - Describe the incidence of skeletal related events in the study population

Electronic Health Record Systems (EHRS) such as Epic and Cerner are being implemented in different medical centers across the nation. The Clinical Decision Support (CDS) tools within the EHRS are increasingly being relied upon to prevent adverse drug events. Many EHRS have the capability to provide extensive screening for drug dosage, drug-drug interaction, duplicate medication order, and drug allergy check through the CDS tools in EHRS. While this is a potentially useful feature, if users are faced with too many alerts in one setting, they may end up overriding both important and unimportant alerts. In addition, if alerts are often inappropriate or insignificant, users may become accustomed to override alerts and overlook significant warnings.

The primary aim of this study is to improve the clinical relevance of medication alerts by filtering out alerts that are deemed to have minimal clinically significance. EHRS users at UC San Diego Health System currently override 85% of medication alerts that are displayed during the ordering process. We hypothesize that if clinically irrelevant alerts are filtered from the current system, the override rate will improve significantly. During the study, we will also explore current system limitations surrounding medication alerts and provided suggestions for development to the EHRS vendor (Epic).

This will be a pre-post retrospective analysis of medication alerts generated during the medication ordering process in the EHRS. In the pre-intervention phase of the study, we will collect medication alert data through Epic EHRS for a 30 day period. In the intervention phase, data collected from preliminary phase will be used to refine and filter out alerts with minimal clinical significance with over-sight from the Safe Medication Practice Committee. In the post intervention phase, a 30 day medication alert data will be collected to compare and contrast the difference between pre and post interventions.

Result and Conclusion: to be presented.

ACPE #:0126-9999-13-236-L05-P

Learning Objectives:
- Lists the steps necessary to refine and eliminate clinically insignificant medication alerts in an academic teaching health system
- Describe how the electronic medication alerts affect medication ordering process, and patient safety

227 - JUSTIFYING AN EMERGENCY DEPARTMENT PHARMACIST POSITION IN A LARGE COMMUNITY HOSPITAL
B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 11:00 AM in Royal IV

The emergency department (ED) is considered to be a high-risk area due to acute patient condition, high patient volume and frequent interruptions. Several publications have shown that incorporating a clinical pharmacist into the ED can achieve positive results such as reduction in medication errors and significant cost savings. Tucson Medical Center is a 629 bed community hospital located in southern Arizona. Currently there is no designated clinical pharmacist working in the ED. The purpose of this project is to define the role of the ED pharmacist for the pilot project, assess the acceptance of pharmacist, and develop a business plan to justify a future ED pharmacist position for this institution. A pilot program was implemented for 4 weeks where 1-2 clinical pharmacist(s) made interventions in the ED 8 hours/day on weekdays. Data were collected on a daily basis using the electronic records. Data collected included number of interventions, types of interventions and acceptance rate of the recommendations made during the pilot period. The amount of time spent on each intervention was also collected. In addition, pre and post-pilot surveys were electronically distributed to assess the ED staff’s views on the clinical pharmacist presence. Calculation of the cost avoidance will be attempted based on the number and types of pharmacist interventions. A business proposal will be developed, including a description of clinical pharmacist’s role and duties in ED, and justification for a future ED pharmacist position. Results and conclusion will be presented.

ACPE #:0126-9999-13-237-L04-P
Learning Objectives:
- List potential areas of pharmacist interventions in the emergency department.
- Describe emergency department staff’s views on the clinical pharmacist presence on-site.


228 - A UTILIZATION REVIEW OF RECOMBINANT FACTOR VIIA AT UCSF MEDICAL CENTER
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Nancy Hung, PharmD
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Presenting on Wednesday, May 15 at 1:30 PM in Sunset III
Background:
Recombinant factor VIIa (rFVIIa, NovoSeven®) was originally approved by the FDA in 1999 for the management of bleeding in patients with hemophilia A or B with inhibitors to factor VIII or IX. Since receiving FDA approval, off-label use of rFVIIa has far surpassed the original FDA-approved indications. Strong evidence behind many of the unapproved indications is lacking, and a mortality benefit has not been demonstrated in trials evaluating rFVIIa for off-label indications.

Objective:
The purpose of this utilization review is to identify and characterize areas of high rFVIIa utilization at University of California, San Francisco Medical Center (UCSFMC) and to propose evidence-based guidelines for rFVIIa usage within such areas.

Methods:
The University HealthSystem Consortium (UHC) Clinical Data Base/Resource Manager (CDB/RM) tool will be queried to quantify rFVIIa usage at UCSFMC from January 2012 to December 2012. rFVIIa use will be stratified by Medicare Severity Diagnosis Related Group (MS-DRG) to identify the MS-DRGs associated with the highest use of rFVIIa. In order to assess whether these MS-DRGs represent possible overutilization, we will compare rFVIIa use at UCSFMC within these MS-DRGs to similar institutions. Using UCSFMC’s electronic medical record, we plan to further characterize rFVIIa prescribing practices within these MS-DRGs, with an emphasis on identifying dosing patterns. A literature search will then be performed to evaluate the evidence behind off-label usage of rFVIIa within these MS-DRGs. Based on the findings, an evidence-based guideline for rFVIIa use within these MS-DRGs will be proposed.

Results:
Preliminary results show that MS-DRGs 219 and 220 were associated with the highest usage of rFVIIa at UCSFMC between January 2012 and December 2012. These two MS-DRGs represent cardiac valve and other major cardiothoracic operating room procedures with major and non-major complications or comorbidities. Even though 64 MS-DRGs were associated with rFVIIa use, rFVIIa usage within MS-DRGs 219 and 220 made up approximately 20% of all rFVIIa inpatient usage during this time period. Further results are pending.

Conclusion:
Conclusions are pending.

ACPE #:0126-9999-13-238-L01-P
Learning Objectives:
   Summarize the steps involved in using the UHC Clinical Data Base/Resource Manager to identify areas of possible drug overutilization within an institution.
   Describe the evidence for rFVIIa use in the setting of cardiac valve surgery.


229 - STERILITY ANALYSIS OF CYSTIC FIBROSIS LIQUID MULTIVITAMINS

A1. Infectious Disease - Anti-infective Agents

Presented by:

Travis Hunt, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Mission Bay
Background: Malabsorption of fat soluble vitamins (A, D, E, and K) is likely in most patients with cystic fibrosis (CF). The CF Foundation has established recommendations for the supplementation of these vitamins. Commercially available vitamin products exist, which attempt to provide all of these fat-soluble vitamins in one supplemental product to be taken on a daily basis. The products are Source CF®, AQUADEKS®, and Vitamax®. These products contain different amounts of the fat-soluble vitamins, and are available as liquid, capsule, and tablet dosage forms.

CF patients are prone to bacterial infections. Environmental sources are likely causes of bacterial colonization of CF patients. One of these sources may be from the plastic dropper or the plastic inside of the bottle of liquid fat-soluble multivitamin supplements. The inside plastic of the bottle or the dropper from the bottle may be sources since bacteria, such as P. aeruginosa, Klebsiella pneumonia, and S. aureus have been shown to be able to adhere to plastic and rubber surfaces inside liquid formulations and are able to survive for long periods of time in these formulations due to this adhesion ability. There is a concern that the plastic dropper or bottle used to deliver liquid fat-soluble multivitamins to CF patients could be a possible source for infection.

Objectives: Determine if an association exists between liquid fat-soluble multivitamins and bacterial colonization of pediatric cystic fibrosis (CF) patients by culturing the bottles, droppers, and multivitamin. Methods: The study design is a prospective data collection study of 18 patients that use liquid fat-soluble multivitamins. Upon entry into the study, the patients will be given an envelope and asked to send a near-empty bottle of liquid fat-soluble multivitamins for testing. The tests that will be performed include a micro-broth test, pH, and visual clarity of the remaining liquid. Micro-broth test for bacterial growth will be done by swabbing the plastic dispensing dropper, the inside of the bottle near the opening, and in the liquid vitamin itself, and placing the swab in the micro-broth. If the micro-broth test becomes positive indicating bacterial contamination, the micro-broth will be sent for microbiology cultures. The results of these cultures will be compared against the patients most recent CF sputum culture obtained at each clinic visit. If the liquid multivitamins and/or the dropper or inside of the bottle test positive for bacterial growth, and if these results match the CF respiratory sputum culture results, then this may show an association between liquid multivitamins and bacterial contamination of sputum for pediatric CF patients.

Results: To be presented

ACPE #:0126-9999-13-239-L01-P
Learning Objectives:
- Describe the potential risk of infection for CF patients using a liquid fat-soluble multivitamin.
- Describe why infection control is important for CF patients.


230 - EVALUATION OF GENTAMICIN DOSING IN A PEDIATRIC POPULATION AND IMPACT OF A PHARMACIST MANAGED GENTAMICIN DOSING PROTOCOL

B6. Pediatric or Gender Specific Care

Presented by:

Paul Huynh, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Sunset II
Gentamicin is the most commonly used antibiotic for treating aerobic, Gram-negative infections in neonatal and pediatric patients. Using current, evidence-based practices, we developed and implemented a pharmacist managed gentamicin dosing and therapeutic monitoring protocol. The goal was to improve dosing patterns and achieve therapeutic levels in a pediatric population. Retrospective data was gathered for patients newborn up to 18 years of age for a one year period, and was compared to prospective data for a 10-week period after protocol implementation. The primary objective of this study is to determine if appropriate levels are achieved for the dosing regimen, both before and after implementation of a pharmacist managed dosing protocol. Results and conclusions will be presented.

ACPE #:0126-9999-13-240-L01-P
Learning Objectives:
- Explain key points of the evidence from primary literature that exists used to devise Swedish’s gentamicin protocol, particularly in regard to dosing and monitoring levels.
- Describe the utility of having a pharmacist managed protocol for gentamicin dosing and monitoring.


231 - COMPARISON OF WEIGHT-BASED VERSUS NON-WEIGHT-BASED SEDATION PROTOCOLS IN THE ADULT INTENSIVE CARE UNIT

B3. Critical Care

Presented by:
Lucia Huynh, PharmD
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*Presenting on Wednesday, May 15 at 10:00 AM in Executive 715*

Introduction: A majority of critically ill patients experience distress while in intensive care units (ICU). Many factors contribute to this distress, including pain, anxiety, and sleep deprivation. Appropriate sedation and pain management is crucial. Inadequate sedation may cause agitation, anxiety, hypoxia, and pain-related compromise of the immune system. Excessive sedation may cause altered mental status, skin breakdown, and increased need for mechanical ventilator support. In an effort to improve care in mechanically-ventilated patients, sedation protocols have been implemented in many ICUs to provide healthcare providers with standardized guidance on how to titrate medications to meet patients’ individual sedative and pain needs. The adult ICU at Long Beach Memorial Medical Center (LBMMC) currently utilizes weight-based dosing of midazolam and fentanyl and daily RASS assessments in its current analgesia-sedation protocol. A newly proposed analgesia-sedation protocol incorporates non-weight-based dosing of midazolam and fentanyl, clearer instructions for titrating and interrupting sedation, and increased frequency of RASS monitoring. The purpose of this project is to compare the effectiveness of two sedation protocols.

Methodology: A retrospective chart review of mechanically-ventilated patients who had ≥72 hours of continuous sedation in the adult ICU was conducted. Patients meeting the following criteria were excluded: pregnancy, severe neurologic disease, psychiatric condition that potentially interfered with delirium assessment, spinal cord injury, acute brain injury, use of neuromuscular blockers aside from use during rapid sequence intubation, presence of tracheostomy prior to ICU admission. The primary endpoint was percent of time within goal Richmond Agitation Sedation Scale (RASS). Secondary endpoints included time to goal RASS, total
midazolam and fentanyl use, duration of mechanical ventilation, length of hospital stay, length of ICU stay, delirium, and all-cause mortality. Results and conclusions will be presented.

ACPE #:0126-9999-13-241-L01-P

Learning Objectives:
- Describe the benefits of utilizing sedation protocols in critically ill patients.
- Identify validated scales used to measure pain, agitation, delirium in critically ill patients.


**232 - THE USE OF PERSONAL HEALTH RECORDS IN PHARMACY PRACTICE TO IMPROVE COORDINATION OF CARE**

C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
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*Presenting on Tuesday, May 14 at 3:00 PM in Palm II*

Introduction/Background:
The adoption of health information technology (HIT) is changing at an accelerated rate due to substantial federal funding through the Health Information Technology for Economic and Clinical Health (HITECH) Act, a provision of the American Recovery and Reinvestment Act (ARRA) of 2009. Modernization of HIT infrastructure is critical in the transformation of US healthcare from a fee-for-service based system to an accountable care model that incentivizes better clinical outcomes and cost-effectiveness. Widespread adoption and meaningful use of electronic health records (EHR) has led to improving clinical outcomes with a stronger focus on patient-centered care, as not only doctors – but also patients – now have greater access to detailed health information through electronic personal health records (PHR).

As medication and disease management experts, pharmacists have great potential to support patient utilization of and coordination of care through PHRs. Pharmacists should encourage and assist PHR use in patients with chronic diseases, who can particularly benefit from common PHR applications such as medication history profiles and refill requests, monitoring lab values, and electronic messaging with provider(s). Similarly, pharmacists can improve coordination of care in hospital discharge settings by helping patients use PHR applications to manage new, discontinued, or high-alert medications and follow-up with providers.

While previous studies have focused on the benefits and barriers to PHR adoption and utilization by patients and providers, there is minimal research involving the pharmacist participation in this process. This study focuses on pharmacists in various practice settings to assess their familiarity with PHRs and their attitudes on the benefits and practicality of applying PHRs to improve coordination of care in their particular practice settings.

Methods:
A survey regarding PHRs will be distributed to a random sample of community, ambulatory care, hospital/critical care, and managed care pharmacists throughout California. The survey will be pre-tested among professionals and non-professionals for clarity and ease of use. The survey will be conducted in-person, over telephone, and by email depending on participant preference. Surveys conducted over telephone will be completed in a standardized manner, using a pre-formatted dialogue with the same set of survey questions.

Results/Conclusions: Will be presented and discussed.
ACPE #:0126-9999-13-242-L01-P
Learning Objectives:
Describe how the use of personal health records can improve coordination of care within hospital discharge, ambulatory care, and community pharmacy practices.
Describe several common applications of personal health records as they relate to pharmacy practice.


233 - SEIZURE PROPHYLAXIS IN TRAUMATIC BRAIN INJURY PATIENTS
B3. Critical Care

Presented by:
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Presenting on Wednesday, May 15 at 9:30 AM in Executive 715

The Brain Trauma Foundation (BTF) guidelines do not provide clear recommendations regarding seizure prophylaxis following traumatic brain injury (TBI). Prophylaxis is recommended to prevent early seizures (those occurring within 7 days of injury), however, early seizures have not been associated with negative long-term outcomes. As a result, there is an inconsistent standard of care within our hospital. The primary objective of this study is to determine the incidence of early seizures in TBI patients who received seizure prophylaxis compared with those who did not. Secondary endpoints will include length of hospital/ICU stay, the incidence of late seizure, and mortality. Subjects will also be analyzed according to age, gender, mechanism of injury, and which antiseizure medication (if any) was administered. The healthcare system’s enterprise data warehouse and medical record system will be used to retrospectively identify all patients who were admitted with a TBI between 10/2007 – 5/2012. Patients will be excluded from the study if they are under 14 years old, have a history of a seizure disorder, were taking any antiseizure medications at the time of injury, or underwent decompressive craniotomy. Descriptive statistics and logistic regression will be presented. Based on outcomes determined by this study, an evidence-based protocol will be developed to help guide our practitioners.

ACPE #:0126-9999-13-243-L01-P
Learning Objectives:
1. Explain the controversy surrounding the administration of prophylactic antiseizure medications in patients with traumatic brain injury
2. Describe the clinical outcomes associated with the administration of seizure prophylaxis compared with no seizure prophylaxis


234 - EVALUATION OF SAFETY AND EFFICACY OF AN INPATIENT PHARMACIST-MANAGED WARFARIN PROTOCOL AT AN ACADEMIC MEDICAL CENTER
B4. General Clinical Practice
Presented by:

Sara Jacobs, PharmD
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Presenting on Tuesday, May 14 at 11:30 AM in Royal IV

The pharmacist-managed warfarin protocol at Banner Good Samaritan Medical Center was implemented in 2009 in accordance to the National Patient Safety Goals to reduce the likelihood of patient harm associated with the use of anticoagulation therapy. Upon receiving a physician order for “Pharmacist-Managed Warfarin Protocol,” clinical pharmacists evaluate patient-specific characteristics and concomitant disease states that may potentially impact response to warfarin, assess concurrent interacting medications, and order daily International Normalized Ratios (INRs). Under the approved protocol, pharmacist responsibilities include monitoring and adjusting warfarin dosing on a daily basis. The objective of this study was to evaluate the safety and efficacy of clinical pharmacist-managed warfarin therapy as compared to conventional physician management.

Two hundred inpatients over the age of 18 years who received at least three days of warfarin therapy during a single hospitalization were included in this retrospective chart review. One-hundred patients who received physician-managed warfarin prior to implementation of the pharmacist-managed protocol were compared to 100 patients who received clinical pharmacist-managed warfarin. A query of the electronic medical record and detailed chart reviews were conducted to collect pertinent demographic, efficacy, and safety data for each group. Demographic data included patients' age, gender, and history of diabetes, heart failure, liver disease, and recent bleeding events. Additional information regarding anticoagulation therapy included warfarin indication, goal INR range, baseline INR, new versus ongoing therapy, and number of days on warfarin therapy during hospitalization. Parameters to evaluate efficacy included time to achieve therapeutic INR, percent of INRs in therapeutic range, number of days on concurrent systemic steroids, interacting antibiotics, non-antibiotic interacting medications, length of stay after initial consult, and INR upon discharge. Safety and adverse drug events were assessed by identifying minor bleeding events, major bleeding events, thrombotic events, vitamin K administration, INR values greater than 3, and percent of days with held warfarin therapy. Results will be presented.

ACPE #:0126-9999-13-244-L01-P
Learning Objectives:
- List the differences between pharmacist-managed and physician-managed warfarin.
- Identify areas for improvement in current warfarin management practices at Banner Good Samaritan Medical Center.


235 - GETTING PREPARED: OBTAINING AND DOCUMENTING MEDICATION HISTORIES AT HOSPITAL ADMISSION

D1. Medication Safety

Presented by:

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Presenting on Tuesday, May 14 at 4:30 PM in Palm I

Introduction: The Institute for Healthcare Improvement (IHI) reports that inaccurate medication lists are responsible for approximately 50% of medication errors and 20% of adverse drug events in the hospital setting. Medication discrepancies at the time of hospital admission are common, and often due to insufficient communication or inaccurate and incomplete information in patients’ medical records. Medication reconciliation is crucial to preventing errors and is a National Patient Safety Goal recommended by the Joint Commission. IHI defines medication reconciliation as “the process of creating and maintaining the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and using that list to guide therapy at all transition points of care”. However, successful completion of medication reconciliation is dependent on various factors at the level of the system, provider and patient, and often requires a great deal of time.

Methodology: Survey of providers to understand challenges and barriers to medication reconciliation processes in the pre-surgical (PREPARE) clinic at UCSF. Based on these findings, a medication history guide and quick tips tool will be developed and implemented to help providers obtain and document patients’ pre-admission medications in the electronic medical record (EMR). The ultimate goal of this project is to improve the completeness and accuracy of medication information in the EMR during hospital admission and improve patient care.

Results and Conclusion: To be presented at Western States

ACPE #:0126-9999-13-245-L05-P

Learning Objectives:
1. Discuss challenges and barriers to obtaining and documenting patient medication histories prior-to-admission for surgery.
2. Describe the development and implementation of a medication history guide and quick tips tool for providers.


236 - RETROSPECTIVE REVIEW OF PROFILNINE DOSE RESPONSE AND EFFICACY AT AN ACADEMIC MEDICAL CENTER

B3. Critical Care

Presented by:

Daniel Jarrell, PharmD
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Presenting on Wednesday, May 15 at 11:30 AM in Executive 715

Introduction: Coagulopathy from trauma or use of anticoagulants may impact clinical outcomes, especially patients with active hemorrhage. A variety of reversal and hemostatic agents have been employed including prothrombin complex concentrate (PCC). The optimal PCC dose has yet to be elucidated for INR reversal or hemostasis. Purpose: To determine the dose response of Profilnine (3-factor PCC) for INR reversal and hemostasis. Methodology: Patients were retrospectively evaluated from June 1st, 2007 through October 31st, 2012 and identified by orders for PCC. Patients were stratified to low-dose (25u/kg) and high-dose (50u/kg) PCC
for first dose administration. INR response and other clinical outcomes were compared between the two dosing methods. Results: To be presented at Western States 2013 Meeting. Conclusion: To be presented at Western States 2013 Meeting.

ACPE #:0126-9999-13-246-L01-P
Learning Objectives:
List 3 factors or treatments that may contribute to an elevated INR and 3 factors or treatments that may contribute to lowering INR.
Describe if high-dose Profilnine is more effective than low-dose Profilnine for INR reversal.


237 - EVALUATION OF CHEMOTHERAPY USE AT THE END OF LIFE IN CANCER PATIENTS AT AN ACADEMIC MEDICAL CENTER
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Tuesday, May 14 at 2:30 PM in Sunset I

Chemotherapy within the last 14 days of life has become a focus of many quality care initiatives, including the National Quality Forum (NQF). The Dartmouth Atlas Project for Medicare patients reported data on end-of-life chemotherapy use in cancer patients with poor prognosis who died between 2003 and 2007. In addition, the American Society of Clinical Oncology (ASCO) in 2012 highlighted a “Top Five” list of common yet costly oncology procedures and treatments that are not evidence-based. Number 1 is the use of chemotherapy in solid tumor patients with characteristics of a low performance status (ECOG 3 or 4), no benefit from previous evidence-based treatment, ineligibility for a clinical trial, and no strong evidence supporting the use of further anti-cancer interventions.

Data from the Dartmouth Atlas report revealed an overuse of chemotherapy at the end-of-life among several large institutions across the nation. Cedars-Sinai Medical Center (CSMC), a large academic medical center in Los Angeles, CA, identified this as an area of opportunity. A survey among oncology pharmacists from other institutions showed that all 17 respondents indicated that their institution had no policies or procedures in place to identify and limit inappropriate use of chemotherapy.

The objective of this study is to characterize clinical indicators for cancer patients who died and received chemotherapy within the last 14 days at CSMC. We hope to develop guidelines for pharmacists to identify patients either receiving or going to receive oral and intravenous chemotherapy to determine if they are appropriate candidates for chemotherapy and defer to a physician group for evaluation.

This is a retrospective review of all cancer patients who received chemotherapy within the last 14 days of life and died during hospitalization at our organization in 2012. Subjects were identified from a mortality review conducted by the Cancer Quality Committee. Chemotherapy was defined using Dartmouth Atlas criteria. We gathered information to determine any influential patient characteristics, such as age, cancer diagnosis, use of oral chemotherapy as an outpatient, code status, and recent prior hospitalizations. We evaluated when chemotherapy was given in relation to the timing of death, as well as if the patient was in the ICU during
hospitalization. We examined the presence and timing of palliative care consultation, and looked for documentation or any predictors of performance status. Data collection and analysis is currently in progress, and results and conclusions will be presented.

ACPE #:0126-9999-13-247-L01-P
Learning Objectives:
1. Describe the issues surrounding the use of chemotherapy at the end-of-life
2. Evaluate the pharmacist’s role in end-of-life care


238 - EVALUATION OF A NEWLY IMPLEMENTED PHARMACY-TO-DOSE VANCOMYCIN PROTOCOL
B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 2:00 PM in Royal IV

Improvement attempts to address the increasing resistance rates, adverse effects, and sub-optimal dosing of vancomycin by physicians, have led to pharmacists becoming more involved in the management of patients receiving this medication. Denver Health Medical Center (DHMC) is a 477-bed hospital, serving as Colorado’s primary safety net institution. With the large variability in current physician prescribing patterns at DHMC, pharmacists have the potential to improve vancomycin utilization and associated health outcomes.

DHMC has developed a pharmacist-managed vancomycin protocol and aims to evaluate its effectiveness. This retrospective program evaluation will compare pharmacist-managed vancomycin therapy to that of traditional physician dosing of vancomycin, following the implementation of a pharmacy-to-dose vancomycin protocol. Patients prescribed vancomycin for healthcare-associated pneumonia (HCAP) or cellulitis, will be included in this study. The primary outcome measured will be the time to goal therapeutic trough range, measured in hours from first vancomycin dose. Secondary outcomes include appropriateness of vancomycin trough levels (timing and percent in range), total daily dose of vancomycin, number of pharmacist interventions, hospital length of stay, and vancomycin usage in number of days.

Results to be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-248-L01-P
Learning Objectives:
- Describe the challenges associated with implementing a pharmacy-to-dose protocol.
- Explain ways a pharmacist-managed protocol can improve patient outcomes.

239 - EVALUATION OF THE IMPACT OF A PHARMACIST-LED CORONARY ARTERY DISEASE MANAGEMENT PROGRAM

B1. Ambulatory Care

Presented by:

Jennifer Johnson, PharmD
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Presenting on Tuesday, May 14 at 11:00 AM in Royal I

Introduction:
Recent data evaluating a hospital transitional care program identified readmission issues related to medications and cardiology complications. The study further implicated that two thirds of acute care hospitals would be negatively impacted financially by Centers for Medicare and Medicaid Services (CMS) Hospital Readmission Reduction Programs by exceeding national measures for 30 day readmission rates for acute myocardial infarction (AMI). Additional reports evaluating data from Medicare beneficiaries from July 2008 through June 2011, demonstrated myocardial infarction as among the top three causes for such penalties related to excess 30-day readmissions. The pharmacist directed medication management diabetes management program at Desert Oasis Healthcare (DOHC) demonstrates statistically significant improvements in patient outcomes as well as a reduction in hospital utilization. Expansion of collaborative programs to address population based chronic disease opportunities led us to develop and implement a CAD program to obtain similar quality outcomes.

Methodology:
This is a prospective study examining the role of a pharmacist to reduce hospital readmissions in an ambulatory care setting within an integrated managed healthcare organization (IMHO). Patients who were recently discharged from the hospital with Coronary Artery Disease (CAD) were referred to medication management for follow-up with a pharmacist to intensely manage their medications relating to their CAD, dyslipidemia, hypertension, and diabetes. Patients will initially be seen for intensive medication reconciliation within 48 hours of discharge. Following this, medications will be initiated and titrated to reach goals for diabetes, HTN, and hyperlipidemia while ensuring adherence with those medications used to control CAD. This will be accomplished through both face-to-face and telephonic interactions with the pharmacist. This study includes all patients who will be managed by MMCAD between February 21, 2013 and May 1, 2013. The primary endpoint will be the reduction of hospital readmission rates or encounters within 30 days of post-stent, CABG and revascularization. Secondary endpoints include: medication adherence target laboratory parameter improvement relating to their disease state(s).

This study directly addresses the issue that chest pain in cardiac patients contributes to the highest number of readmissions in our IMHO. The goal is to optimize patient care, medication reconciliation, and medication compliance using evidence based medicine (EBM) as outlined in the MMCAD protocol.

Results:
Patients are scheduled to be seen starting February 21, 2013; thus, results are pending are not available at this time.

Conclusion:
MMCAD expects to help increase medication compliance and reduce unnecessary/avoidable hospital readmissions within 30 days.

ACPE #:0126-9999-13-249-L01-P

Learning Objectives:
Identify roles for pharmacists in the management of coronary artery disease.
Describe the outcomes of Medication Management Coronary Artery Disease (MMCAD) patients who are post percutaneous coronary intervention with stenting (PCI), Coronary Artery Bypass Grafting (CABG).


240 - THE ROLE OF A PHARMACIST CO-MANAGED CLINIC IN THE TREATMENT OF CHRONIC HEPATITIS C VIRUS IN A VETERAN POPULATION
B1. Ambulatory Care

Presented by:
Jessica A. Johnson, PharmD
VA Roseburg Healthcare System
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Presenting on Tuesday, May 14 at 11:30 AM in Royal I

Introduction:
The Veterans Health Administration is the largest single provider of hepatitis C (HCV) care in the United States with about 3% of Veterans diagnosed with chronic HCV.1 In 2011, the U.S. Food and Drug Administration approved two new direct-acting antivirals (DAA), telaprevir and boceprevir, for the treatment of genotype 1 chronic HCV in conjunction with peg-interferon and ribavirin. Although revolutionizing treatment and becoming part of the standard of care, DAAs increase the complexity, costs, and adverse events that accompany treatment. These reasons make close monitoring of viral response, drug interactions, and patient tolerance vital to the success of treatment. HCV viral loads, lab tests, and patient tolerance must be obtained and monitored frequently throughout treatment to ensure adequate viral load suppression and to monitor for adverse events. A pharmacist co-managed hepatitis C clinic was started to aid in monitoring patient response, discuss therapy issues, serve as a resource to answer questions, and to provide intensive patient education. The purpose of this review is to gain insight into the role and duties of the pharmacist in managing a hepatitis C clinic.

Methodology:
All patients selected for HCV treatment from September 2012 – March 2013 were included. Prior to the patient starting therapy, drug interactions were identified and recommendations made. Patients were also provided education on complete medication use, adverse effects and how to manage them, and the importance of medication compliance. Throughout treatment, patients were contacted and compliance and tolerance were assessed. Clinic details and conclusions will be presented.

ACPE #:0126-9999-13-250-L01-P
Learning Objectives:
Describe the potential role for pharmacists in the management of chronic hepatitis C.
List possible common side effects with triple therapy treatment.


241 - ONE-STOP SHOPPING: INTEGRATING MEDICATION USE INFORMATION INTO THE ONLINE FORMULARY AT THE UNIVERSITY OF UTAH HOSPITALS AND CLINICS
C2. Technology Management (Comp/InfoSys/Drug Dist)
Presented by:

Kiersten Johnston, PharmD
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Presenting on Tuesday, May 14 at 3:30 PM in Palm II

Hospital medication use policies and guidelines help ensure the appropriate use of medications, which helps increase drug safety and minimize drug costs. University of Utah Hospitals and Clinics (UUHC) medication use policies are currently accessed individually through the University of Utah Drug Information Service webpage. The institution’s formulary is accessed online through LexiComp™ and the drug monographs do not include specific medication use policy information. The separate formulary and medication use policies may limit the ability of clinicians to access the appropriate policies due to time constraints or lack of knowledge about how to access the medication use policies.

The main objective of this project is to integrate medication use information into the UUHC online formulary. The long-term goal is to increase medication use information accessibility for hospital staff, which may increase compliance with the policies and satisfaction with the formulary. This is a descriptive quality-improvement project that consists of surveys to other institutions and to pharmacy personnel at UUHC. The information obtained from these surveys determined which medication use policies were integrated into the online formulary. The primary outcome is integration of medication use information into the formulary. The secondary outcome is comparing UUHC pharmacy personnel utility of and satisfaction with the policies and online formulary before and after integration.

The primary outcome is complete. Information from our system’s standard concentration policy, formulary restrictions policy, and parenteral drug policy has been incorporated into the online formulary. Education to pharmacy personnel regarding these changes is underway. Secondary outcomes remain under investigation, with data collection and evaluation currently being conducted. Study results to be presented at Western States Conference.

ACPE #:0126-9999-13-251-L01-P
Learning Objectives:
- Describe a strategy for increasing clinician compliance to fundamental medication use policies
- List techniques for assuring successful implementation and maintenance of an integrated medication use information system


242 - APPROPRIATE USE OF RITUXIMAB: EVALUATIONS OF CD20 AND HEPATITIS B TESTING PRIOR TO RITUXIMAB ADMINISTRATION
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Jennifer Joo, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Sunset I
Introduction:
Rituximab is a chimeric monoclonal antibody against the protein CD20 that is found on the B lymphocyte. Rituximab has a FDA indication for treatment of Non-Hodgkin Lymphoma (NHL). Candidates for rituximab therapy should have their CD20 receptor status tested prior to initiating therapy. In rare cases, patients treated with rituximab may have increased risks for hepatitis B virus (HBV) reactivation. Center for Disease Control and National Comprehensive Cancer Network recommend testing for evidence of HBV in patients receiving immunosuppressive therapy. The purpose of this study is to evaluate the rates of CD20 receptor and HBV testing in patients with NHL undergoing rituximab therapy.

Methodology
Institutional review board approval was obtained for a retrospective chart review of patients who received rituximab for NHL. This study is a single center, single arm, and retrospective chart review. Men and women greater than 18 years of age who received rituximab for treatment of NHL at Loma Linda University Medical Center (LLUMC) from January 2010 to December 2011 were included in the study. Each qualified patient’s medical records were reviewed for the CD 20 and hepatitis B tests obtained prior to the rituximab administration at LLUMC. CD 20 status was confirmed by bone marrow and or mass biopsies via Fluorescent In Situ Hybridization or immunohistochemical tests. HBV tests consisted of core and surface HBV antibodies and surface antigen tests.

Results and conclusions to be presented

ACPE #:0126-9999-13-252-L01-P
Learning Objectives:
1. Explain the rationale for CD20 receptor testing prior to rituximab therapy
2. Explain the rationale for HBV testing


243 - COMPARISON OF THE EFFECTIVENESS OF TWO METHODS OF ANTIBIOTIC FORMULARY RESTRICTION: FRONT-END VERSUS BACK-END APPROVAL
A1. Infectious Disease - Anti-infective Agents

Presented by:
Stephen Jung, PharmD
VA Long Beach Healthcare System
Stephen.Jung@va.gov

Presenting on Tuesday, May 14 at 11:00 AM in Mission Bay

INTRODUCTION: With increasing antibiotic resistance and disproportionately fewer antibiotics in development, preserving antimicrobial utility has become increasingly important. To address this growing concern, antimicrobial stewardship programs have been implemented in hospitals nationwide as recommended by various bodies such as the Centers for Disease Control (CDC) and The Joint Commission (TJC). Commonly used stewardship methods include formulary restriction and preauthorization, prospective audit with intervention and feedback, guidelines and clinical pathways, streamlining/de-escalation of antibiotics, IV-PO switch, computerized physician order entry and clinical decision support, and antimicrobial cycling. VA Long Beach Healthcare System has always used a “front-end approval” process: formulary restriction that requires Infectious
Diseases approval (by the ID fellow) before piperacillin-tazobactam can be given. However, even with this system in place, piperacillin-tazobactam continues to be the second most commonly prescribed antibiotic at this institution. Generally, once piperacillin-tazobactam has been approved, physicians tend not to streamline therapy to narrow-spectrum agents, with the majority of patients continuing treatment on piperacillin-tazobactam. The Antimicrobial Stewardship Committee proposed changing this restriction policy to a “back-end approval” process, whereby any provider can prescribe piperacillin-tazobactam up to 72 hours but requires Infectious Diseases approval thereafter to continue piperacillin-tazobactam therapy. The primary objective of this study is to compare the effectiveness of back-end approval versus front-end approval in decreasing the use of piperacillin-tazobactam at VA Long Beach. Outcome measures will include antibiotic usage (days of therapy), antibiotic costs, length of hospital stay, clinical & microbiological cure/failure rates, 30-day mortality rates, and C. difficile rates.

METHODOLOGY: Subjects who had a course of piperacillin-tazobactam for ≥72 hours at VA Long Beach from October 1, 2011 to September 30, 2013 will be included in the study. Data collected from CPRS and IV statistical data will include the following: patient age, gender, ward location, infection diagnosis, severity of illness, comorbidities, 30-day mortality, length-of-stay, length of piperacillin-tazobactam course, modification of antibiotic therapy, C. difficile infection rates, and antibiotic costs. Descriptive statistics as well as paired t-test, chi-square/Fisher exact test, Mann-Whitney rank sum test, and other non-parametric tests will be performed as necessary.

RESULTS & CONCLUSION: Will be discussed at presentation.

ACPE #:0126-9999-13-253-L01-P

Learning Objectives:

Explain the advantages and disadvantages of front-end approval and back-end approval for antibiotic stewardship.
Describe the effectiveness of each approach in reducing use of piperacillin-tazobactam.


244 - IMPLEMENTATION AND EVALUATION OF A PROTOCOL FOR COLONY-STIMULATING FACTOR USE AT A COMMUNITY HOSPITAL

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Joseph Kalis, PharmD
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Presenting on Tuesday, May 14 at 3:30 PM in Sunset I

Introduction: Filgrastim and pegfilgrastim are colony-stimulating factors (CSF) utilized for prevention and treatment of chemotherapy-induced neutropenia and febrile neutropenia. However, their use is often not in compliance with established guidelines. In an endeavor to promote effective CSF use, a guideline-based protocol will be implemented. To further promote positive patient outcomes, the goal of this study is to implement a standardized protocol for CSF use and assess its efficacy from clinical and pharmacoeconomic perspectives.

Methodology: The hypothesis of this study is that the implementation of a screening tool and protocol encouraging appropriate usage of CSFs for prevention of febrile neutropenia will increase rates of compliance with the National Comprehensive Cancer Network (NCCN) Myeloid Growth Factor guidelines. The first phase of
the study is a retrospective analysis of CSF usage to determine compliance rates with the NCCN Myeloid Growth Factor guidelines. The second phase is implementation of the screening tool and protocol and education regarding the guidelines. Compliance rates with the guidelines and appropriateness of CSF use will be determined. Data collected from the pre and post-implementation stages will be used as comparators to determine the effectiveness of the protocol. The hospital’s electronic medical record system will be used to identify patients who have received CSFs and those who have been admitted to Memorial Hospital with a diagnosis of febrile neutropenia (FN) for two years preceding protocol implementation (retrospective group) and for 2 months following protocol implementation. Patients younger than 18 years of age will be excluded from the study. Data collection includes the number of FN admissions, patient age, gender, CSF agent used, CSF dose, and FN risk classification per the NCCN Myeloid Growth Factor Guidelines. Primary outcomes are rate of compliance with these guidelines, with subgroup analyses of the number of FN admissions and the percent of patients with varying degrees of FN risk (high, intermediate, low) receiving CSF prophylaxis. The secondary outcome is a pharmacoeconomic analysis based upon the acquisition cost of CSF agents used. Statistical analysis will be done using the \( \chi^2 \) test to compare endpoints between groups. Forty-one patients per group are needed to detect an effect size of 0.3 with 80% power and an \( \alpha = 0.05 \) level of significance. This study was approved by Memorial Hospital's Institutional Review Board.

Results: Data is currently being collected. Results will be available during the presentation.

Conclusion: Data and conclusions from this study will be presented.

ACPE #:0126-9999-13-254-L01-P

Learning Objectives:
- Describe the use of colony-stimulating factors for prevention of febrile neutropenia.
- Explain the recommendations from evidence-based guidelines for the appropriate use of colony-stimulating factors for prevention of febrile neutropenia.


245 - DEVELOPMENT AND IMPLEMENTATION OF A PHARMACIST SERVICE TO REDUCE READMISSIONS FOR HYPERGLYCEMIC CRISIS

A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Lisa Kallas, PharmD
PeaceHealth Southwest Medical Center
lkallas@swmedicalcenter.org

Presenting on Wednesday, May 15 at 10:30 AM in Mission Bay Foyer

Background
PeaceHealth Southwest (PHSW) is a 450 bed community hospital located in Vancouver, WA. The inpatient glycemic control service at PHSW is an ASHP (American Society of Health-System Pharmacists) Best Practice Award winning program recognized for providing excellent inpatient glycemic control and diabetes education. The Glycemic Control Team consists of a pharmacist who manages insulin regimens for specified patients and a diabetes educator who provides education to patients with diabetes who meet specified criteria. Diabetic ketoacidosis (DKA) and hyperglycemic hyperosmolar state (HHS) are considered hyperglycemic crises and are the two most serious acute metabolic complications of diabetes. Hospital admissions for DKA and HHS
are costly and often preventable. The purpose of this project is to determine if post discharge education provided by a pharmacist can reduce hospital readmissions for DKA and HHS.

Methods
This project consists of three phases. Phase one is a retrospective chart review to determine the number of admissions and 30 day readmissions for DKA or HHS at PHSW from August 2011 through August 2012. Phase two is the development and implementation of a pharmacist service to provide post discharge education for patients who are admitted with DKA or HHS. Education is provided in three follow up telephone calls made at two days, ten days, and thirty days post discharge. Men and women age 18 and older admitted to PHSW with DKA or HHS and who consent to participate are included in the project. Phase three is a retrospective chart review to determine the number of admissions and 30 day readmissions for DKA or HHS during the service implementation period. Phase three also includes a comparative analysis of admission and 30 day readmission data from phases one and three to evaluate the impact of this pharmacist provided service on DKA and HHS readmissions.

Results
Phase one: Inpatient admissions where DKA or HHS is a primary or secondary diagnosis at PHSW from September 2011- August 2012 numbered 206 admissions for 160 patients. Readmission at PHSW within 30 days of a previous encounter where DKA or HHS is a primary or secondary diagnosis numbered 34 readmissions for 23 patients.


Phase three: Results are pending and will be presented.

ACPE #:0126-9999-13-255-L01-P

Learning Objectives:
1. List two common precipitating causes of DKA and HHS in patients with diabetes
2. Describe two strategies for preventing the occurrence of DKA and HHS


246 - EVALUATION OF PHARMACIST-DIRECTED COUNSELING TO ENHANCE ANTIDEPRESSANT ADHERENCE AND PHQ-9 SCORES

A5. Neuro-Psych or Pain Management Agents

Presented by:

Marisa Kaluhiokalani, PharmD
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Presenting on Tuesday, May 14 at 4:00 PM in Palm III

Background:
Approximately 1 in 5 adults in the United States have at least one episode of major depression in their lifetime. According to the findings of the Sequenced Treatment Alternatives to Relieve Depression (STAR*D) trial, depressive disorders can be challenging to treat. After exposure to four different treatment levels or intervention options, approximately one-third of patients in this trial never achieved remission and treatment failure was associated with a number of aspects including medication adherence. In a recent study it was found that antidepressant non-adherence rates range from 13% (at the onset of prescription) to 55.7% (at 6 months). Poor adherence results from both patient-related (e.g. side effects, misperceptions about the medication) and
clinician-related (e.g. poor instruction by the clinician about the medication, poor follow-up care) causes. The primary objective of this study was to determine the efficacy of pharmacist-directed counseling in improving antidepressant medication adherence.

Methods:
This trial received both IRB and Kaiser Permanente (KP) Hawaii P & T approval in December 2012, whereupon 130 patients with an acute diagnosis of depression (diagnosis within the past 3 months) were identified by Kaiser Permanente’s Panel Support Tool (chronic disease registry) and randomized into a treatment or control arm. Patients were additionally required to have filled a new/re-initiated oral antidepressant prescription, be at least 18 years of age, and use a KP network pharmacy. Those with a diagnosis of psychosis or dementia, possessing limited command of the English language (both patient and primary caregiver), residing in a long term care facility or care home, or unable to be contacted by telephone were excluded from this trial. Patients in the control arm received usual care defined as depression-related care provided by physicians and other ancillary providers, whereas those in the treatment arm received additional pharmacist-directed counseling which utilized the KP B-SMART (Barriers, Solutions, Motivation, Adherence tools, Relationship, Triage) and motivational interviewing methods. Patients were contacted via telephone call at 1, 2, and 3 months to assess understanding of antidepressant therapy and address any medication adherence issues. Follow-up data was collected at the end of months 1, 2, and 3. The primary outcome of this trial was medication adherence defined as pick-up of antidepressant within 1 week of due date. Secondary outcomes included: change in Patient Health Questionnaire-9 (PHQ-9) scores from baseline to the end of month 3, primary non-adherence, defined as failure to obtain a new prescription within 30 days after it had been prescribed, and prescription abandonment, defined as failure to obtain a new prescription within the three month study duration or failure to pick-up a refill within 1 month of due date.

The results and conclusion will be presented.

ACPE #:0126-9999-13-256-L01-P
Learning Objectives:
- Identify potential causes for antidepressant non-adherence in patients with depression.
- Describe the impact pharmacist-directed adherence counseling can have on antidepressant adherence in patients with depression.


247 - TWO YEAR UPDATE ON EVALUATION OF PATIENTS, SAFETY, AND EFFICACY OF SIPULEUCEL-T FOR TREATMENT OF PROSTATE CANCER AT USC
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Evan Kam, PharmD
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Presenting on Wednesday, May 15 at 10:00 AM in Sunset I

Sipuleucel-T is an immunotherapy approved for the treatment of asymptomatic or minimally symptomatic metastatic castrate-resistant prostate cancer (mCRPC) based on the IMPACT trial. There is limited long-term data regarding the use of sipuleucel-T in patients outside of clinical trials and those with history of chemotherapy, opioid use or visceral metastases. The study objective was to evaluate baseline patient...
characteristics, safety, and efficacy of sipuleucel-T use at the USC/Norris Cancer Center and Hospital. A retrospective chart review was performed on patients who received at least one sipuleucel-T infusion between June 2010 and February 2013 at USC/Norris Cancer Hospital. A prospective log was used to track patients with electronic medical records to correlate clinical variables for all patients. Safety was assessed by measuring the incidence of infusion-related reactions and whether patients received all three doses of sipuleucel-T. Efficacy was evaluated by measuring time to progression requiring further treatment. A descriptive analysis will be performed to evaluate patients, safety, and efficacy of sipuleucel-T use. Results and conclusion will be presented upon the completion of data collection and analysis.

ACPE #:0126-9999-13-257-L01-P
Learning Objectives:
- Describe the characteristics of patients with metastatic castrate-resistant prostate cancer receiving sipuleucel-T.
- Describe the safety and efficacy of sipuleucel-T in patients with metastatic castrate-resistant prostate cancer.


248 - IMPLEMENTATION OF DIABETES FOCUSED COMPREHENSIVE DRUG THERAPY MANAGEMENT SERVICES FOR MEDICARE BENEFICIARIES IN A PRIMARY CARE CLINIC

B1. Ambulatory Care

Presented by:
Tara Kamprath, PharmD
Yakima Valley Memorial Hospital
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Presenting on Tuesday, May 14 at 2:00 PM in Royal I

Introduction & Purpose: Current American Diabetes Association (ADA) guidelines recognize the need for a patient centered approach for optimal management of diabetes. Yakima Valley Memorial Hospital is participating in the national Patient Safety Clinical Pharmacy Collaborative (PSPC) in partnership with Health Resources and Services Administration (HRSA) and Qualis Health in order to facilitate change and the implementation of novel interventions to improve patient care. The objective of this study is to evaluate the impact of pharmacist-directed, diabetes focused, comprehensive drug therapy management services for Medicare beneficiaries in a primary care clinic.

Methods: This project was granted exempt status by Institutional Review Board. Through the PSPC collaborative, a pharmacist -directed, diabetes focused, Comprehensive Drug Therapy Management (CDTM) service for Medicare beneficiaries was developed. A retrospective chart review was conducted to identify primary care patients from November 2011 to November 2012 who were not meeting ADA standards for diabetes management. Identified patients were invited by the pharmacy staff to receive CDTM services in addition to their usual care. Core CDTM services include: diabetes knowledge assessment, disease and medication focused education, medication therapy review, completion of personal medication records, and development of medication-related self-management action plans. Documentation of encounter findings in addition to therapy or referral recommendations was communicated to the primary care provider utilizing a warm hand-off approach or through the electronic health record system. Follow-up phone calls and or appointments were made by the pharmacist as needed.
Outcome measures to be evaluated include: disease state knowledge, and adverse drug events, patient and prescriber participation, actual and potential adverse drug events, patient and prescriber satisfaction, the number and type of pharmacist-directed interventions implemented, medication compliance, and correlation between disease state knowledge assessment score and Hgb A1C.

Results: Pending
Conclusion: Pending

ACPE #:0126-9999-13-258-L01-P
Learning Objectives:
1. Describe the benefits of CDTM services within a primary care clinic.
2. List barriers to initiation of CDTM services within a primary care clinic.


249 - DATA ENVELOPMENT ANALYSIS (DEA) IS A METHOD OF BENCHMARKING PRODUCTIVITY AT CHA HOLLYWOOD PRESBYTERIAN MEDICAL CENTER (HPMC)
C1. Pharmaco economics, Admin or Financial Mgmt

Presented by:
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CHA Hollywood Presbyterian Medical Center
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Presenting on Wednesday, May 15 at 2:00 PM in Sunset III

Background:
Measuring productivity in an acute care setting has been one of the challenges for pharmacy profession. There is no universal method that could be employed by the hospital and pharmacy administrators that effectively measure departmental productivity. The most common measure of productivity employed by hospitals is the full time equivalent (FTE) per number of doses dispensed or FTE per adjusted patient days. Today, the hospital pharmacy departments engage in academic and clinical activities, and those common traditional productivity measures fail to take into account the time and resources spent on the non-distribution activities. DEA addresses the limitations associated with these traditional methods since it considers multiple outputs and inputs of the pharmacy department.

Objective:
The objective of the research is to determine whether using DEA is a more accurate and comprehensive productivity measure than the methods used at HPMC.

Methods:
Productivity is measured by taking the ratio of output per unit of input. The retrospective observational study compares the productivity of the department of pharmacy at CHA HPMC from 2010 to 2012 using three different methods. The three different methods included the FTEs per adjusted patient days, FTEs per units of doses dispensed, and the DEA method. DEA is a linear programming technique that compares a set of organization’s actual inputs used to produce their actual output levels during a common time period. FTEs were used as the input and clinical workload, distribution workload, teaching workload, and quality of the work were chosen to be the outputs for the DEA in this study. The data was gathered from the organization’s financial records and regression analysis was performed to compare the three methods.
Results:
The results of the study will be discussed during the presentation.

ACPE #:0126-9999-13-259-L04-P
Learning Objectives:
- List the common methods of measuring productivity in the hospital pharmacy
- Describe the current challenges in using the DEA as a method to measure productivity


250 - DEVELOPMENT OF A CLINICAL PHARMACIST INTEGRATED PAIN MANAGEMENT PROGRAM FOR A SAFETY NET POPULATION
B1. Ambulatory Care

Presented by:

Priti Kaneria, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Royal I

Introduction: Managing patients with chronic pain syndromes is often an unappealing task for many primary care providers (PCPs) due to the potential for opioid abuse and diversion as well as other safety concerns. Clinical pharmacists have successfully integrated pain management services in many healthcare organizations, relieving some of the burden of this patient population on PCPs as well as improving outcomes and safety. However, limited reports are available demonstrating benefits of integrated clinical pharmacy services in pain management programs within a safety-net clinic setting.

Objective: To determine the pain management needs among a network of community clinics within a large safety net organization, which will assist in the development of a clinical pharmacist integrated pain management service.

Methods: The pain management needs across a network of 6 urban safety net clinics will be determined by demographic analysis of patients with chronic pain as well as via an electronic needs assessment survey of providers. The demographic information will be obtained by retrospective chart review through an IT data extraction from an electronic health record (NextGen). A data query will be generated by a Medical Informatics Report Analyst to collect various elements, and additional data elements will be obtained through manual chart review of the extracted records. The population of interest will consist of patients > 13 years of age with chronic pain and excluding cancer patients, those who are pregnant, patients residing in a skilled nursing facility (SNF)/long-term care (LTC) facility or receiving hospice/palliative care, patients with a terminal illness, acute pain, and patients with < 2 pain related visits. The needs assessment survey consists of a mix of 14 free response and Likert Scale questions which will be given to providers in order to identify the greatest needs and challenges of managing patients with chronic pain, as perceived by the providers that are currently treating these patients. Results and conclusions will be presented.

ACPE #:0126-9999-13-260-L01-P
Learning Objectives:
- Describe the population of patients suffering from chronic pain in terms of the 3 most common chronic pain diagnoses, and the most common class of analgesic used.
Explain what providers perceive to be the biggest challenges associated with pain management.


251 - RISK OF INJURY IN ELDERLY PATIENTS USING GASTROINTESTINAL ANTISPASMODIC/ANTICHOLINERGIC DRUGS
B5. Long-Term, Geriatric or Hospice Care

Presented by:
Fatima Karim, PharmD
Specialty Residency in Drug Information, Kaiser Permanente
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Presenting on Tuesday, May 14 at 10:00 AM in Sunset IV

Introduction: Gastrointestinal (GI) antispasmodics/anticholinergics are commonly used to manage GI pain and related symptoms (diarrhea, gas, constipation), as well as symptoms associated with irritable bowel syndrome. The updated Beers Criteria and Medicare recommend that these drugs generally be avoided in the elderly. In response to these and other directives, a Kaiser Permanente interregional initiative, Drugs to Avoid in the Elderly, was implemented, recommending the limited use of GI antispasmodics/anticholinergics based on their strong anticholinergic side effects which may precipitate falls and fractures. Literature assessing the actual risk associated with these agents, however, is limited. The objective of this study is to determine the risk of injury associated with the use of GI antispasmodic/anticholinergic agents in elderly patients and to describe which subgroups may be at especially increased risk for GI antispasmodic/anticholinergic–associated injury.

Methodology: This retrospective case-control study evaluated Kaiser Permanente patients in the California regions ages 65 years and older, with cases being identified as those with a documented new injury resulting in a hospitalization, emergency room or urgent care visit (index date) from January 2009 through December 2010. Cases and controls were matched in a 1:4 ratio based on age and gender, and all patients had to have continuous Kaiser Permanente enrollment and a drug benefit for at least six months before the index date. GI antispasmodic/anticholinergic exposure for all cases and controls was evaluated within 60 days prior to the index date. A descriptive analysis was first conducted to compare baseline characteristics for cases and controls. The unadjusted rates of injury were compared using chi-squared tests, and conditional logistic regression adjusted for covariates was performed with risk estimates presented as odds ratios with 95% confidence intervals.

Results: We identified 54,359 cases with an injury and matched 206,637 controls. Further results to be discussed.

Conclusions: To be discussed.

ACPE #:0126-9999-13-261-L01-P

Learning Objectives:
- Explain the risk of injury associated with the use of GI antispasmodic/anticholinergic agents in elderly patients
- Describe which subgroups may be at especially increased risk for GI antispasmodic/anticholinergic–associated injury

252 - BARRIERS TO INSULIN THERAPY INITIATION AMONG PRIMARY CARE PROVIDERS & PATIENTS IN SAFETY NET CLINICS

B1. Ambulatory Care

Presented by:
Ilana Katz, PharmD
USC Ambulatory Care
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Presenting on Tuesday, May 14 at 3:00 PM in Royal I

Purpose: Poor control of diabetes mellitus is a major cause of cardiovascular disease, kidney disease, blindness, amputations, and nerve damage. While oral medications are available for patients with Type 2 diabetes, the majority of these patients eventually require insulin therapy as the disease progresses. Current treatment guidelines recommend that patients with an A1C (measure of average blood glucose control over 90 days) greater than 9.0% should receive insulin therapy. However, many patients with A1C levels above 9.0% remain on oral medications only, particularly in the safety net environment. It is unclear what the reasons for this are, nor whether the barriers are associated with providers, patients or both. The purpose of this study is to describe the patient and physician perceived barriers to the initiation of insulin therapy in uncontrolled diabetes patients receiving care from safety net clinics. Misperceptions among patients and physicians contribute to the underuse of insulin in poorly-controlled diabetes patients receiving care from safety net clinics.

Methodology: This retrospective study utilized existing data from the medical records of patients that were treated at QueensCare Family Clinics. Patient inclusion criteria included: patients seen by a provider at least 3 times between October 31, 2011 and November 1, 2012, and patients with a last A1C of at least 9%. In order to analyze patient and provider perceived barriers to insulin initiation, an anonymous survey utilizing a Likert scale and derived from validated surveys was administered to those patients that fell into the inclusion criteria. The primary care providers for these patients received a similar survey with questions derived from validated sources, but specific to healthcare professionals.

ACPE #:0126-9999-13-262-L01-P
Learning Objectives:
- Explain how physician perceived barriers may play a role in insulin inertia
- Explain how patient perceived barriers may play a role in insulin inertia


253 - METABOLIC MONITORING IN MANAGED CARE PEDIATRIC PATIENTS WHO RECEIVED SECOND GENERATION ANTIPSYCHOTICS

B6. Pediatric or Gender Specific Care

Presented by:
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Introduction: Second generation antipsychotics (SGAs) increasingly are being prescribed in the pediatric patient population and are associated with metabolic adverse effects such as weight gain, hyperlipidemia, and glucose abnormalities. Metabolic monitoring is essential for early detection and intervention to prevent poor health outcomes; however, monitoring practices have not been well studied in pediatric populations. The purpose of this study is to describe a managed care pediatric population newly initiated on an SGA and identify percentages of patients who 1) received recommended monitoring at baseline and follow-up, 2) developed a metabolic effect subsequent to SGA initiation and 3) received a pharmacologic or behavioral intervention for the metabolic effect.

Methods: This study was a retrospective cohort analysis at Kaiser Permanente of Colorado (KPCO). Patients <18 years of age, who purchased a newly initiated SGA between January 1, 2002 and June 30, 2011 at a KPCO outpatient pharmacy, were included. The primary study outcome was the percentage of patients who received all metabolic monitoring at baseline and follow-up after SGA initiation. Metabolic monitoring was defined as lipid, fasting blood glucose, blood pressure, and weight measurements. Metabolic effects at follow-up were defined as weight gain of >7%, blood pressure ≥95th percentile based on age and weight, LDL ≥110 mg/dL, and fasting blood glucose >100 mg/dL. Pharmacologic and behavioral interventions for patients who experienced a metabolic effect were examined. Patient characteristics and outcomes will be compared using t-tests and chi-square tests for continuous and categorical data, respectively.

Results/Conclusion: A total of 1023 patients, mean age 13 years, initiated an SGA during the study. Of these, 63% initiated risperidone, 19% quetiapine, 12% aripiprazole, 5% olanzapine, and 1% ziprasidone. The most common diagnoses were mood disorder (31%) and depression (20%). Five percent of patients received all recommended baseline monitoring and 3% received all recommended follow-up monitoring. The percentage of patients with monitoring for each parameter at baseline and follow-up, respectively: lipids (15% and 10%), glucose (8% and 12%), blood pressure (58% and 45%), and weight (55% and 43%). Metabolic effects and clinical interventions are being evaluated, and results will be presented.

ACPE #:0126-9999-13-263-L01-P
Learning Objectives:
   - Describe the importance of metabolic monitoring in a pediatric patient population taking antipsychotics.
   - Describe potential metabolic effects and recommended clinical interventions for pediatric patients taking antipsychotics.


254 - DEVELOPMENT AND IMPLEMENTATION OF AN ELECTRONIC INPATIENT ANTIBIOTIC REPORT IN VETERANS AFFAIRS MEDICAL CENTERS

Presented by:

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Presenting on Tuesday, May 14 at 4:00 PM in Palm II
Introduction: The inappropriate utilization of antimicrobials is a major problem in the medical community, with studies demonstrating that up to 50% of all antimicrobial use is inappropriate. Many studies have demonstrated the benefits of antimicrobial stewardship efforts, which include decreased resistance rates, healthcare costs, hospital length of stay, and infection-related mortality, along with increased appropriate utilization of antimicrobials and cure rates. A frequent opportunity for stewardship efforts occurs approximately 48 hours after initiation of broad spectrum antibiotics. At this critical time, microbiology results often become available, and the safety and efficacy of antibiotic therapy may be assessed. To encourage appropriate management of antimicrobial therapy during this pivotal time, we implemented a multifaceted approach, which incorporates provider education and the development of informatics tools, including an antibiotic ordering template and a computer generated antibiotic rounding report that will inform and guide decisions to continue, modify, or discontinue antimicrobial therapy. This presentation will focus specifically on the development and implementation of the antibiotic rounding report.

Methods: The computer generated antibiotic rounding report will be implemented at the VA Greater Los Angeles Medical Center on March 11, 2013, with expansion to the rest of the country throughout the next year. Data for the report will be collected from the VHA corporate data warehouse (CDW) and refreshed daily, providing a clinical health summary of inpatients receiving antimicrobial therapy. This summary is divided into four categories of data: patient information, antibiotics, vitals/labs, and microbiology. The data presented in the report will aid clinicians in clinical decisions regarding patients’ antimicrobial therapy. To allow clinicians to focus on specific patients of interest, the report will allow the user to include or exclude specific patients and filter the patients based on location and duration of antimicrobial therapy.

Results: Will be presented. Measured outcomes will include number of admissions, percent of admitted patients that receive at least one dose of antibiotic, and percent of admitted patients that receive a course of at least three days of antimicrobial therapy.

Conclusion: Will be presented.

ACPE #:0126-9999-13-264-L01-P
Learning Objectives:
Describe how the use of an electronic clinical report can facilitate the appropriate management of antimicrobial therapy in an integrated medical region.
List the ways in which this clinical report can contribute to improved outcomes for patients receiving inpatient antimicrobial therapy.


255 - AN ANTIMICROBIAL STEWARDSHIP PILOT IN AN OUTPATIENT RENAL DIALYSIS UNIT
A1. Infectious Disease - Anti-infective Agents

Presented by:
Lehua Kay, PharmD
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Presenting on Tuesday, May 14 at 11:30 AM in Mission Bay

BACKGROUND: Infection is a leading cause of illness and the second leading cause of death in patients undergoing chronic dialysis treatment. Antimicrobial stewardship is an emerging field defined by a series of
strategies and interventions aimed at improving appropriate use of antibiotics, combating antimicrobial resistance, improving patient outcomes, and reducing cost in various healthcare settings. The process of prospective review and feedback represents a key tenant in numerous antimicrobial stewardship programs and has shown to be an effective strategy in reducing inappropriate use of antimicrobials. The role of the clinical pharmacist acting as an antimicrobial steward performing prospective reviews and feedback has been documented in various healthcare settings such as hospital-inpatient, pediatrics, intensive care units, and long term care facilities. There is scarce documentation of clinical pharmacists performing antimicrobial stewardship prospective review and feedback in the outpatient renal dialysis setting.

METHODOLOGY: Daily print outs of microbiology culture reports were developed to facilitate antimicrobial stewardship prospective review and feedback for four outpatient renal dialysis units within the Franciscan Health System. Pharmacist driven recommendations to add, continue, adjust, change or discontinue antimicrobial therapy were communicated via a faxed document to the provider. Urgent interventions were communicated directly to the provider via phone. The number of interventions made, type of intervention made, and intervention acceptance rate were assessed during the evaluation time period.

RESULTS: Data unavailable at time of abstract submission.

CONCLUSION: A pharmacist performing prospective review and feedback to providers regarding antimicrobial treatment for outpatient renal dialysis patients promotes antimicrobial stewardship, enhances provider/pharmacist relationships, and facilitates positive continuum of care in this patient population. Implementation of an antimicrobial management tool designed to report real-time microbiology cultures will allow the pharmacist to provide evidence based timely recommendations to add, continue, adjust, change, or discontinue antimicrobial therapy in outpatient renal dialysis patients.

ACPE #: 0126-9999-13-265-L01-P

Learning Objectives:
- Identify strategies for antimicrobial stewardship in an outpatient renal dialysis unit.
- Explain challenges and opportunities for pharmacists performing antimicrobial stewardship prospective review and feedback in the outpatient renal dialysis setting.


256 - CLINICAL DECISION SUPPORT DRUG-DRUG INTERACTION ALERT OVERRIDES: A COMPARISON OF INTENSIVE CARE UNITS AND GENERAL WARDS

B3. Critical Care

Presented by:

Nadine Kazem, PharmD
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Presenting on Wednesday, May 15 at 11:00 AM in Executive 715

Objectives: The intensive care unit (ICU) population is at an increased risk for medication errors over general ward patients as a result of increased severity of illness, more medications administered per patient, and exposure to high-risk drugs. Although medication errors in the ICU can occur throughout any stage of the medication use process, the prescribing phase has been associated with a higher proportion and increased severity of potential adverse drug events (ADEs). This study was designed to investigate the rate and
characteristics of override alerts of potential drug-drug interactions (DDIs) in the ICU compared to non-ICU patients.  

Methods: This study is a retrospective, chart review in adult ICU and general ward patients conducted at two major academic medical centers. Study subjects were identified through the electronic medical record database. Inclusion criteria consisted of the following: (1) subjects ≥18 years of age; (2) admitted to an ICU or general ward floor; and (3) ≥1 Clinical Decision Support Software (CDSS) DDI alert generated. Data collection occurred over the course of 3 months consisting of a 1-day period for a total of 3 days. Data collection consists of the patient’s age, location, gender, creatinine clearance, medications involved in the DDI alert(s), override reason(s), and severity of DDI alert(s). The target sample size is 400 subjects to be included in the analysis (200 subjects at each institution). The primary endpoint will be to compare the incidence of DDI override rates between ICU and general ward beds. Secondary analysis will evaluate the override reasons and potential severity. 

Results: Data collection and analysis are still in progress and will be complete by April 2013. 

Conclusion: Study conclusions will be made after final analysis of the data.

ACPE #:0126-9999-13-266-L01-P 
Learning Objectives: 
- Identify factors associated with overriding drug-drug interaction alerts in the intensive care unit population. 
- Explain strategies to improve provider compliance rates with drug-drug interaction alerts in the intensive care unit population. 


257 - POSACONAZOLE SERUM LEVELS FOR TREATMENT AND PROPHYLAXIS OF INVASIVE FUNGAL INFECTIONS IN IMMUNOCOMPROMISED PATIENTS 

A1. Infectious Disease - Anti-infective Agents 

Presented by: 
Aimee Keegan, PharmD 
City of Hope 
akeegan@coh.org 

Presenting on Tuesday, May 14 at 2:30 PM in Mission Bay 

Introduction: Posaconazole is a triazole antifungal agent used for salvage treatment and prophylaxis of invasive fungal infections in immunocompromised patients. Due to its variable absorption and pharmacokinetic profile, a wide range of steady state plasma concentrations following posaconazole administration have been observed. Currently, data on therapeutic drug monitoring for posaconazole and clinical correlation is limited. The aim of this study is to evaluate posaconazole levels associated with treatment response and breakthrough prevention with invasive fungal infections in immunocompromised patients. 

Methodology: A retrospective chart review was performed on all patients aged 18 years or older with reported posaconazole drug levels at City of Hope between January 1, 2008 and December 31, 2011. Data was collected on baseline characteristics, patient-specific factors that could affect posaconazole serum levels, the use of previous or concomitant antifungals, and adverse reactions to posaconazole. Response to treatment at 90 days was assessed for patients receiving posaconazole salvage therapy, and the presence of breakthrough infection was documented for patients receiving posaconazole prophylaxis. 

Results: Results will be presented upon completion of the study.
Conclusions: Full analysis and conclusions will be presented upon completion of the study.

ACPE #:0126-9999-13-267-L01-P

Learning Objectives:
- List therapeutic drug levels that correlate with clinical response to posaconazole salvage treatment.
- Describe serum concentrations that are associated with the prevention of invasive fungal infection breakthrough in immunocompromised patients receiving posaconazole prophylaxis.


**258 - DEVELOPMENT OF A POST-GRADUATE YEAR TWO (PGY2) HEALTH-SYSTEM ADMINISTRATION RESIDENCY**

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Logan Kelly, PharmD
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Presenting on Wednesday, May 15 at 2:30 PM in Sunset III

There is a national shortage of pharmacists trained and willing to fill necessary leadership roles. Increasing the number and diversity of accredited administrative pharmacy residency programs can help bridge this pharmacy leadership gap. PeaceHealth Southwest Medical Center is a 450 bed community teaching hospital with over 26,000 inpatient visits each year. A proposed partnership with the Catholic Health Initiatives (CHI) would combine nine PeaceHealth hospitals with seven CHI hospitals, creating the 2nd largest health system in the Northwest US. With the management headquarters of this new health system based in Vancouver, WA, our facility is in a position to provide a robust and unique training to future pharmacy leaders. The objective of this project was to develop and successfully implement an American Society of Health-System Pharmacists (ASHP) accredited post-graduate year two (PGY2) health-system administration residency for our institution.

To develop and implement a residency program that satisfies the ASHP PGY2 accreditation standard for health-system administration, several strategies were used to create the residency content. First, a literature search was conducted and accreditation standards were reviewed to set up the outline for program development. A review of 10 comparable PGY2 programs was conducted to provide background on other residency formats and curricula. A GAP analysis was performed to identify strengths and areas of improvement for the development of our program. Residency structure and content was developed using the Residency Learning System (RLS) model. Content developed includes: Purpose and mission statements of the residency, residency curriculum, preceptor credentialing, continuous quality improvement measures, and residency logistics. A site survey checklist was developed that corresponded to the ASHP accreditation requirements, and a mock accreditation survey was conducted to ensure our site was prepared for the ASHP accreditation process. Results and conclusions to be presented at the Western States Conference in May 2013.

ACPE #:0126-9999-13-268-L01-P

Learning Objectives:
- List the factors contributing to the pharmacy leadership shortage.
- Describe strategies to develop a health-system administration residency program.
259 - MEDICATION RECONCILIATION IN THE HOME HEALTH SETTING: USING A 5- POINT MEDICATION RECONCILIATION TOOL AND REFERRAL TO PHARMACIST

B1. Ambulatory Care

Presented by:

Artak Kerimian, PharmD
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Presenting on Tuesday, May 14 at 3:30 PM in Royal I

Background: Approximately 20% of all adverse drug events have been attributed to poor communication at the transitions and interfaces of care. Medication reconciliation has been recognized by The Joint Commission as an important process in care transitions to prevent adverse health outcomes related to medications. Most patients referred to home health, whether upon hospital discharge, from a skilled nursing facility, after surgery, or from a physician’s office have complicated medication regimens that require proper medication reconciliation. Home health nurses and physical therapists are critically positioned to conduct medication reconciliation at the home where a patient takes his/her medication. The introduction of a “5-point medication reconciliation tool” for utilization by home health nurses and physical therapists may improve the transitions of care process by increasing the detection of medication discrepancies and potentially decrease medication errors. The “5-point medication reconciliation tool” is designed to detect medication discrepancies in the following five categories: duplications, omissions, medication adherence, affordability and drug interactions. Home health staff can also utilize the services of a clinical pharmacist as support to conduct a comprehensive medication reconciliation for patients discharged from Kaiser Permanente Panorama City hospital and contracted skilled nursing facilities.

Methods: A retrospective chart review of home health provider notes was conducted using Kaiser Permanente’s electronic medical record, looking specifically at documented medication discrepancies. The rates of documented medication discrepancies were compared before and after implementation of the “5-point medication reconciliation tool” for the home health staff. Discrepancies were categorized into one of the following: medication omissions, duplications, drug interactions, adherence or affordability. In addition, data was collected on patient characteristics associated with more complicated medication reconciliations requiring a clinical pharmacist intervention.

Results and Conclusion: Will be discussed.

ACPE #:0126-9999-13-269-L01-P

Learning Objectives:

Describe the 5-point medication reconciliation tool and its components.

List patient characteristics requiring more in depth medication reconciliation.


260 - EVALUATION OF A PHARMACIST-MANAGED CONGESTIVE HEART FAILURE (CHF) CLINIC AS COMPARED TO NATIONAL GUIDELINES AND STANDARDS OF CARE

A3. Cardiovascular Care - Cardiovascular Agents
INTRODUCTION: Congestive Heart Failure (CHF) is associated with significant morbidity and mortality. Various studies have demonstrated that multidisciplinary disease-management programs improve clinical outcomes including re-hospitalization, emergency room visits, patient functional status, and appropriate use of medications. Clinical pharmacists need to play an active role in accomplishing these interventions and improving overall heart failure patient quality-of-life. We wish to evaluate the treatment of heart failure patients seen in a pharmacist-managed CHF clinic as compared to national guidelines and standards of care. The primary outcome for our research is the proportion of clinic patients taking ace-inhibitors, beta-blockers, aldosterone antagonists, and antiplatelet agents, documentation of patient education, adherence rate of patients with an indication for an ICD and/or CRT, and CHF emergency room and readmission rates. Secondary outcomes include the number of patients whom have achieved target dosages or maximum tolerated dosages.

METHODOLOGY: Retrospective chart reviews were performed on patients seen in the Pharmacy Congestive Heart Failure Clinic. This study was performed at Claremore Indian Hospital (CIH) in Northeastern Oklahoma with an American Indian population of approximately 63,000. Inclusion criteria were a diagnosis of congestive heart failure, a completed echocardiogram with a documented ejection fraction, and being seen by a primary care provider whom completed a referral to the CHF clinic. Exclusion criteria included patients whom did not show up for initial CHF clinic visit or failure to comply with follow-up clinic visits. Each patient will serve as his/her own control. Statistical analysis will include the Wilcox signed rank test to measure change from baseline to follow-up given the small sample sizes and the nature of the variables. McNemar’s test will be performed to assess whether patients met their goals.

RESULTS & CONCLUSION: We are still in the process of gathering data and examining results. Analysis of research and outcomes will be presented at conference.

ACPE #:0126-9999-13-270-L01-P
Learning Objectives:  
- Describe the results of a pharmacist-managed CHF clinic compared to national guidelines and standard of care  
- Explain how a pharmacist-managed clinic affected emergency room visits and hospital readmission rates


261 - VANCOMYCIN CLEARANCE RELATIVE TO CREATININE CLEARANCE IN PATIENTS RECEIVING AN EXTENDED COURSE OF VANCOMYCIN THERAPY  
B7. Pharmacokinetics

Presented by:  
Hana Kim, PharmD  
Veterans Affairs San Francisco Medical Center  
hana.kim3@va.gov
Presenting on Tuesday, May 14 at 9:00 AM in Sunset III

Vancomycin is commonly used to treat gram-positive infections including methicillin-resistant Staphylococcus aureus (MRSA) and has been studied in various patient populations to optimize dosing. Current guidelines at the San Francisco VA Medical Center (SFVAMC) indicate weekly monitoring of serum vancomycin concentrations (SVCs) in patients treated with an extended course of vancomycin therapy even when renal function appears to be unaltered. There are limited studies evaluating whether or not vancomycin pharmacokinetics change with duration of therapy with stable or altered renal function. The objective of this study is to determine if the ratio of vancomycin clearance (CLv) to creatinine clearance (CLcr) changes in patients receiving an extended course of vancomycin therapy. This retrospective study includes inpatients on vancomycin at SFVAMC with 2 SVCs at least 7 days apart. SVCs drawn between July 1, 2002 and June 30, 2012 will be evaluated starting with 2012 and going back until 100 eligible patients have been identified. Patients 18 years or older, first SVC within the first 7 days of treatment, second SVC at least 7 days later, and SVCs reflecting vancomycin regimen of at least 2 revised half-lives will be included. Patients will be excluded from the study if they are receiving dialysis, have unstable renal function, or have received vancomycin within the past 6 months. Uncertainty in dosing history or sampling times, undetectable SVCs or those drawn during the distribution phase will be excluded. In addition, patients with serum creatinine (SCr) less than 0.3 mg/dL, have a change of greater than 10% in body weight without a documented explanation, history of spinal cord injury, or are receiving a neuromuscular blocker will be excluded. Vancomycin dosing history, SVCs, expected vancomycin clearance and volume (V) will be entered into TDMS (Therapeutic Drug Monitoring System, Healthware, Inc), a pharmacokinetics computer program to determine patient specific half-life, CLv, V and their confidence intervals using Bayesian analysis. Patient characteristics and pharmacokinetic parameters will be compared for the 2 SVCs including the ratio of CLv to CLcr. Results and conclusions will be presented.

ACPE #:0126-9999-13-271-L01-P
Learning Objectives:
- Describe the relationship between vancomycin clearance (CLv) and creatinine clearance (CLcr) in patients who received an extended course of vancomycin therapy.
- Describe patients who would require ongoing vancomycin plasma concentration monitoring.


262 - EVALUATION OF GLYCEMIC CONTROL OUTCOMES AND PERFORMANCE IMPROVEMENT IN NON-CRITICALLY ILL PATIENTS INITIATED ON A BASAL-BOLUS INSULIN REGIMEN.
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Jeannie Kim, PharmD
Glendale Adventist Medical Center
kimj16@ah.org

Presenting on Wednesday, May 15 at 10:00 AM in Mission Bay Foyer

BACKGROUND:
Glycemic control in hospitalized patients has become an area of major therapeutic focus, where higher blood glucose levels in hospitalized patients are independently associated with increased morbidity and mortality. Historically, correctional scale insulin therapy has been the mainstay of glycemic management for hospitalized general medical ward patients. However, recent randomized control trials, such as the RABBIT 2 Trial, have proven that basal-bolus insulin regimens produce an overall lower mean blood glucose level in hospitalized patients and produce safer, faster, and better results when compared with historical sliding scale insulin. The preferred, more proactive method for achieving and maintaining glucose control in non-critically ill patients with diabetes or stress hyperglycemia is with a basal, nutritional, and supplemental correctional scale insulin therapy.

**OBJECTIVE:**
To assess efficacy and improvements in point-of-care blood glucose of basal-bolus insulin as compared with prior regimen changes in physician prescribing habits, and overall acceptance of basal-bolus recommendation

**METHODS:**
Potential patients are identified through GAMC’s Microblog glycemic alert program. Patients are eligible for basal-bolus insulin therapy if they have had two consecutive point-of-care blood glucose (POC BG) readings greater than 180mg/dl over 48 hours on their current glycemic regimen. Diabetes type, nutritional status, home regimens, and objective data are all assessed and considered prior to determining patient-specific basal-bolus regimens. Once tailored regimens are calculated, recommendations are made to the primary physicians. Patients were excluded if endocrinology had already been consulted and on the case. Outcomes measured were those of clinical success including physician acceptance of overall recommendation and POC BG improvement or at goal of less than 180mg/dl. The results and conclusions are to be discussed.

**ACPE #:0126-9999-13-272-L01-P**
Learning Objectives:
- Explain the basal-bolus principle and its advantages over correctional scale insulin therapies as supported by the RABBIT-2 trial.
- Describe how to calculate a basal-bolus insulin regimen for a non-critically ill hospitalized patient.


**263 - EFFICACY OF FLUCONAZOLE THERAPY FOR FUNGAL URINARY TRACT INFECTIONS DUE TO CANDIDA IN THE SETTING OF RENAL FAILURE**
A1. Infectious Disease - Anti-infective Agents

Presented by:

**Brian Kim, PharmD**
University of Southern California School of Pharmacy - Acute Care
kimbrick@usc.edu

*Presenting on Tuesday, May 14 at 2:00 PM in Mission Bay*

**Introduction:**
Fluconazole is an effective therapy for fungal urinary tract infections (UTI), as it demonstrates marked activity against susceptible species of Candida, excretion in the urine is primarily in the form of unchanged drug, and it is available as both oral and intravenous preparations with nearly equivalent bioavailability. However, patients who are unable to produce adequate urine may not achieve sufficient urinary tract concentrations of fluconazole to successfully treat such infections. At the Keck Medical Center of USC, Candida urinary tract infections in patients with renal failure are often treated with locally administered antifungal therapy, using
amphotericin B bladder irrigation strategies. Assessing for the potential utility of fluconazole is important, as the efficacy of amphotericin B bladder irrigation remains controversial, in addition to an absence of standardized use, and tolerability is limited by numerous adverse reactions. The purpose of this study is to evaluate for the potential efficacy of fluconazole used to treat Candida UTI in the setting of renal failure, and to assess the current practice for treating Candiduria at the Keck Medical Center of USC.

Methodology:
A retrospective study will be conducted at the Keck Medical Center of USC, evaluating patients with renal failure, defined as a creatinine clearance of less than 15 mL/min or receipt of renal replacement therapy, who have received fluconazole therapy to treat Candida urinary tract infections. All patients who were admitted between March 2011 and November 2012 with a positive fungal urine culture will be screened for inclusion and exclusion criteria. The primary endpoint of the study is the microbiologic clearance of Candida from the urinary tract, as assessed per follow-up fungal urine cultures. A secondary endpoint will be the resolution of Candida urinary tract infections, as evaluated by follow-up urinalysis.

Results:
To be presented after completion of data collection.

Conclusion:
To be presented after completion of data collection.

ACPE #:0126-9999-13-273-L01-P
Learning Objectives:
- Describe pharmacologic properties of fluconazole as an effective therapeutic modality in treating fungal urinary tract infections.
- List potential pharmacologic options for treating fungal urinary tract infections.


264 - EFFECTIVENESS OF A GROUP VISIT MODEL IN POPULATION MANAGEMENT OF HEART FAILURE PATIENTS

B1. Ambulatory Care

Presented by:
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Kaiser Permanente Central Valley Area - Managed Care Pharmacy Residency Program
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Presenting on Tuesday, May 14 at 4:30 PM in Royal I

Introduction
There are approximately 2400 patients in the Kaiser Permanente Central Valley Area (CVA) Heart Failure Registry. The Heart Failure (HF) Program managed about 5-10% of the CVA HF patients using a care management model. This model required a referral by the provider and then intensive management by the HF care manager with frequent follow-ups. The Medical Directors and Management Team of the Chronic Conditions Management (CCM) department of the CVA decided to incorporate a new strategy of population management into the HF Program and not rely on referrals only. One component of this strategy is to contact and manage a greater percentage of these patients by modifying the existing HF classes to HF group visits. Patients are contacted to attend a 2 hour group visit for an educational counseling session about heart failure and an opportunity for an individualized medication evaluation by a HF care manager. The group visit is an opportunity
for patients to learn about their heart failure condition, lifestyle changes, and heart failure medications. The HF care managers will be able to target more patients and maximize their time and resources through these group visits.

Methodology
The HF group visit was launched as a pilot project from December 2012 to February 2013. Retrospective data analysis was done after the conclusion of the pilot period.

The study included patients (1) in CVA’s heart failure registry, (2) ages > 17 years old, (3) who had at least one hospital or emergency room admission with a heart failure related diagnosis within the last 12 months (from September 1, 2011 to August 30, 2012), and (4) who attended a group visit during the pilot period.

Patients were excluded if they were (1) already managed by HF care managers, (2) SNF patients, (3) hospice patients, or (4) ESRD patients.

The primary objective was to evaluate the effectiveness of a group visit in optimizing HF medications and increasing patient’s knowledge of HF. The types of interventions by care managers were assessed. Patients’ knowledge about HF and ability to self-manage their HF condition was evaluated with an anonymous pre-visit and post-visit assessment with questions about the disease state, lifestyle changes, and medications. The secondary objective was to determine patient’s satisfaction with the group visit through the administration of an anonymous group visit evaluation survey form.

Results
Descriptive statistics was used to analyze the collected data. Results of the study will be presented.

Conclusion
The data gathered from this pilot study will be used by the CCM Leadership to identify strengths and areas for improvement of the group visit model for population management of HF patients in the CVA.

ACPE #:0126-9999-13-274-L01-P

Learning Objectives:
Explain if population management by group visit for heart failure patients is an effective strategy.
Describe the change in patient understanding of heart failure before and after a group visit.


265 - MANAGEMENT OF MEDICATION-RELATED PROBLEMS AT TRANSITIONS OF CARE BY MEDICAL HOME PHARMACISTS FOR A SAFETY NET POPULATION

B1. Ambulatory Care

Presented by:
Grace Kim, PharmD
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Presenting on Tuesday, May 14 at 4:00 PM in Royal I

INTRODUCTION: Approximately one-fifth of adults suffers an adverse event after hospital discharge, and up to two-thirds of these events is attributed to medication-related problems (MRPs). Most adverse drug events resulting in hospitalization are preventable, and the cost of these admissions amounts to $100 billion each year. A large body of evidence points to the utility of medication reconciliation in reducing MRPs, and the Joint Commission strongly endorses medication reconciliation at care transitions as a means to reduce medication discrepancies and preventable adverse drug events. With expertise in medication therapy and safe, cost-
effective medication use, pharmacists are well suited to identify and resolve MRPs. Several studies have demonstrated the benefits of pharmacist interventions, such as reduced adverse drug events post-discharge as well as medication-related ED visits and hospital readmissions. However, few studies have been conducted among patients receiving post-discharge medication reconciliation services from pharmacists in safety net clinics, which face numerous challenges such as limited resources, limited information technology systems, and literacy and cultural barriers. This study aims to explore the effect of safety net medical home pharmacist interventions at transitions of care on reducing MRPs and readmissions to the ED or hospital.

METHODOLOGY: A retrospective review of the medical records of patients served at five safety net clinics will be performed to identify post-discharge MRPs as well as any 30-, 60-, and 90-day readmissions to the ED or hospital. A process will also be developed to refer patients for an appointment with a clinical pharmacist in the safety net clinic within 24-48 hours after discharge to receive timely medication reconciliation and counseling.

RESULTS AND CONCLUSION: Data evaluating the impact of pharmacist interventions on the quality and safety of medication therapy and readmissions will be presented.

ACPE #:0126-9999-13-275-L01-P
Learning Objectives:
- List common medication-related quality and safety gaps among post-discharge safety net patients.
- Describe how post-discharge patients can receive pharmacist-conducted medication reconciliations that lead to the resolution of important medication-related problems and a reduction in ED or hospital readmissions.


266 - CONTINUED ASSESSMENT ON THE EFFICACY OF USING TREATMENT PRACTICE GUIDELINES AT VERIFICATION FOR PNEUMONIA & C. DIFFICILE

B4. General Clinical Practice

Presented by:
Paul S Kim, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Royal IV

This study is a continuation of an earlier research project which focused on the implementation of Treatment Practice Guidelines for pneumonia and Clostridium difficile into the pharmacist workflow as a proactive strategy to improve the Antibiotic Stewardship Program at Kaiser Permanente South Sacramento and to improve quality of care. The major limitation of the previous study was the short assessment time period. This study seeks to address the limitation by extending the assessment periods to 8 months prior to implementation and 8 months after implementation and re-evaluating the outcomes of the previous study which found an increase in antibiotic utilization and duration. Methodology: This study is a single-centered, retrospective, cohort study that will review data 8 months prior to implementation, and 8 months after implementation. The intervention was implemented in a previous study by Carly Auch, Pharm.D. titled “The impact of implementation of Treatment Practice Guidelines for pneumonia and Clostridium difficile into the pharmacist workflow.” The study population will be selected by medical chart review of patients with an active diagnosis at discharge of pneumonia or Clostridium difficile within the Kaiser Permanente electronic medical records. Inclusion criteria include 1) patients greater or equal to 18 years of age, 2) time period 11/1/2010 to 6/30/2011 for pre-implementation
data, 3) time period 11/1/2011 to 6/30/2012 for post-implementation data, 4) admissions to South SACRAMENTO for greater or equal to 24 hours, 5) patients with active hospital problem at discharge of pneumonia or Clostridium difficile, and 6) patients re-admitted within 30 days of a previous discharge from a hospital. Exclusion criteria includes 1) patient less than 18 years of age, 2) admissions outside the designated time period, 3) admissions to South Sacramento for less than 24 hours, 4) patients diagnosed with fungal or viral pneumonia, 5) patients not receiving antibiotic treatment, 6) patients re-admitted within 30 days of previous discharge from a hospital for reasons other than pneumonia or Clostridium difficile, 7) pregnancy, 8) terminally ill and 9) developmentally disabled. The primary objective is to compare the pre and the post implementation data on the following: 1) length of hospitalization, 2) re-admission for the same diagnosis, 3) inpatient days on antimicrobials, 4) Clostridium difficile cases, 5) total antibiotic utilization, and 6) multiple days on antimicrobials. The results and conclusions will be presented.

ACPE #:0126-9999-13-276-L01-P
Learning Objectives:

- Describe the impact of incorporating treatment practice guidelines into the pharmacy workflow at verification
- Explain the advantages and disadvantages of using treatment practice guidelines within the pharmacy workflow


267 - EVALUATION OF METHODS TO ESTIMATE GLOMERULAR FILTRATION RATE VERSUS ACTUAL DRUG CLEARANCE IN PATIENTS WITH CHRONIC SPINAL CORD INJURY
B7. Pharmacokinetics

Presented by:

Christine Kim, PharmD
Veterans Affairs Long Beach Health Care System
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Presenting on Tuesday, May 14 at 8:30 AM in Sunset III

Introduction: Patients with chronic spinal cord injury (SCI) frequently suffer from complicated infections requiring high doses of renally eliminated antibiotics such as vancomycin and aminoglycosides (AG). The current standard to empirically dose these antibiotics utilizes the Cockcroft-Gault formula to estimate renal function. However, literature has shown that the Cockcroft-Gault equation often overestimates the renal function in these immobile patients who commonly have significant muscle wasting, leading to improper dosing of these antibiotics and increased risk of adverse drug events or toxicity. In a recent retrospective study, Evaluation of Methods to Estimate Glomerular Filtration Rate versus Actual Drug Clearance in Patients with Chronic Spinal Cord Injury by Lee and Dang from Veterans Affairs Long Beach Health Care System (VALBHCS), the investigators developed a new equation to more accurately estimate the glomerular filtration rate (GFR) in SCI patients to optimize dosing for vancomycin and AG. A prospective study began in September 2011 at VALBHCS to confirm and validate this new study equation.

Methodology: Our study is a continuation of a prospective chart review observing patients with chronic SCI from September 2011 to April 2013 who received antibiotic dose based on the new study equation. The primary objective of this study is to test and validate the new study equation by determining the percentage of patients
achieving therapeutic drug level targets defined by specific indication. The secondary objective is to evaluate the difference between patients’ actual drug clearance and creatinine clearance determined by the new study equation. This study will also assess if there is a difference in accuracy of the study equation between anatomical degrees of SCI when compared to patients’ actual drug clearance. The study includes subjects from VALBHCS who have a diagnosis of SCI for at least one year and have received vancomycin or an aminoglycoside with at least one drug level drawn at steady state. Data collected includes antibiotic use and administration records, drug levels, patient demographics, and serum creatinine levels at time of antibiotic use and at time of 24 hour endogenous creatinine clearance. Pharmacokinetic calculations will be performed via drug level analysis to obtain pharmacokinetic parameters including drug clearance, K elimination constant, and volume of distribution. Statistical analyses such as two-tailed paired t-test, chi-squared, and other non-parametric tests will be used to analyze the data as appropriate. The final results and conclusions will be reported after all data collection and analysis have been performed.

ACPE #:0126-9999-13-277-L01-P
Learning Objectives:
- List reasons that predispose SCI patients to increased risks of adverse events from overdosing of renally cleared antibiotics
- Describe currently available methods used to estimate glomerular filtration rates in relation to the SCI population


268 - IMPACT OF PHARMACIST DRIVEN INTERVENTIONS ON ADVERSE EVENTS RELATED TO OPIOID ANALGESIC USE
B4. General Clinical Practice

Presented by:
Min Jeung Kim, PharmD
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Presenting on Tuesday, May 14 at 2:30 PM in Royal IV

Introduction:
Opioid analgesics are a well known cause of adverse drug events. The Joint Commission released a Sentinel Event Alert last year cautioning the health care community about the adverse events related to opioid analgesic use in hospital settings. The objective of this study is to evaluate the role of pharmacist interventions in decreasing the adverse events related to opioid analgesic use in an acute care community hospital.

Methodology:
Pharmacist interventions will be implemented to increase the safety of patients from the potential adverse effects of opioid analgesics, compatible with the recommendations of the Joint Commission. A rule-based computer program will be used to screen for patients on opioid analgesics meeting criteria that may increase their risk for adverse events. The following criteria will be used to screen patients for further clinical evaluation: patients greater than 70 years of age, patients on concurrent CNS depressant medications, respiratory comorbidities, and patients on multiple opioid analgesics. Each patient will be evaluated and monitored for appropriateness and safety of therapy. Education to nursing and medical staff will be implemented concurrently.
The rate and pattern of adverse events related to opioid analgesics will be compared to the baseline adverse drug event rates prior to the implementation. Results and conclusion will be discussed.

ACPE #:0126-9999-13-278-L01-P

Learning Objectives:
- Describe patient populations with increased risk factors for adverse events related to opioid analgesics
- Describe strategies that can be implemented in an acute care community hospital to minimize adverse events due to opioid analgesics


269 - EVALUATION OF THE ROLE OF THE PHARMACIST IN TRANSITIONS OF CARE FOR CYSTIC FIBROSIS PATIENTS AT A PEDIATRIC HOSPITAL

B6. Pediatric or Gender Specific Care

Presented by:

**Jin Kim, PharmD**

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Presenting on Wednesday, May 15 at 8:30 AM in Sunset II

BACKGROUND: The treatment of cystic fibrosis (CF) is complex and involves multiple medications. Studies have shown that CF patients have multiple drug related problems including potential drug-drug/drug-food interactions, complicated dosing regimens, and poor adherence to medications, especially in the pediatric population where adherence rates can drop below 50%. Each year, one in three patients with CF is hospitalized, mostly due to pulmonary exacerbations. Of these patients, over 10% are readmitted to the hospital within 30 days of discharge. In an effort to reduce readmission rates of patients with chronic diseases, many hospitals have adopted pharmacist-led discharge counseling programs. Counseling sessions and medication reconciliation conducted by pharmacists at transitions of care have been studied and evaluated to be effective in potentially reducing healthcare associated costs and readmission rates. Studies have also shown that pharmacists play a vital role as part of an interdisciplinary team to reduce hospitalization rates and decrease costs associated with chronic diseases. The potential impact of a pharmacist in reducing readmission rates at a pediatric hospital through medication reconciliation at discharge has not yet been evaluated in recent studies. Pharmacists are part of Children’s Hospital Los Angeles (CHLA) CF multidisciplinary team to provide complete medication reviews and to counsel patients on how to properly use their medications, to identify potential drug/food interactions, and to assist in medication scheduling at each clinic visit. At CHLA, a PGY-1 pharmacy resident also conducts comprehensive medication counseling for CF patients who are being discharged home.

OBJECTIVES:
1. Evaluate the clinical impact of pharmacist interventions and discharge counseling in transitions of care by comparing 30-day readmission rates before and after the addition of a pharmacist to the multidisciplinary CF team.
2. Analyze and categorize pharmacist interventions at the outpatient CF clinic.

METHODS: Using retrospective chart review, readmission rates within 30 days of discharge for CF patients were analyzed prior to and after the addition of a pharmacist to the CHLA CF Clinic. Pharmacist interventions were recorded at each clinic visit and categorized based on the types of interventions made. These categories
included dosing adjustments, addition or discontinuation of medications, medication formulation changes, drug-drug interaction identifications, and appropriate medication usage counseling.

RESULTS AND CONCLUSIONS: To be presented.

ACPE #:0126-9999-13-279-L01-P

Learning Objectives:
- Describe the potential role of a clinical pharmacist in reducing hospital readmissions.
- Describe the impact of a clinical pharmacist at Children’s Hospital Los Angeles Cystic Fibrosis Clinic.


270 - CHARACTERIZATION OF DIABETES RISK FACTORS IN NON-DIABETIC PATIENTS ON CHRONIC STATIN THERAPY

B1. Ambulatory Care

Presented by:

William King, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Sunset V

Introduction

Individual trials and meta-analyses have demonstrated an association between statin use and the development of type 2 diabetes. The JUPITER trial was a randomized, double-blind, placebo-controlled trial evaluating the use of rosuvastatin for primary prevention of cardiovascular events in 17,802 patients with elevated high-sensitivity C-reactive protein (hs-CRP). In addition to the primary outcome, JUPITER reported new type 2 diabetes diagnoses. This secondary analysis compared the incidence of new type 2 diabetes diagnoses in patients randomized to placebo and rosuvastatin and further stratified patients based on four major risk factors for the development of type 2 diabetes: impaired fasting glucose, BMI ≥ 30 kg/m2, A1C > 6%, and metabolic syndrome. Patients were categorized as zero (n=6,095) or ≥ 1 (n=11,508) major risk factor(s) for type 2 diabetes. When rosuvastatin was compared with placebo, patients with ≥ 1 major risk factor(s) experienced a 39% reduction in the primary endpoint, but a 28% increase in incidence of new type 2 diabetes diagnoses whereas those with zero risk factors experienced a 52% reduction in the primary endpoint with no difference in new diagnoses of type 2 diabetes.

The mechanism by which statins are associated with new onset type 2 diabetes remains unclear. The JUPITER trial included patients with elevated hs-CRP, which may be an independent risk marker for incident type 2 diabetes. Furthermore, JUPITER evaluated a single statin at a single dose, rosuvastatin 20mg. The prevalence of major risk factors for type 2 diabetes among real-world patients, with or without elevated hs-CRP, who are receiving available statins at various doses is unknown.

Methodology

This is a retrospective observational study that will describe the prevalence of type 2 diabetes risk factors over time in patients without diabetes who are receiving chronic statin therapy. All available statins at all doses will be considered. Major risk factors include: impaired fasting glucose (100 – 125 mg/dL), BMI ≥ 30 kg/m2, A1C > 6%, and metabolic syndrome.
Risk factors will be determined for each patient at baseline and throughout the study period to describe how their prevalence changes after beginning statin therapy. Descriptive statistics will be used to analyze the diabetes risk factors.

Results
Data collection is currently underway; results will be presented.

Conclusion
Data collection is currently underway; conclusion to be determined upon analysis of results.

ACPE #:0126-9999-13-280-L01-P

Learning Objectives:
1) Explain the differences between the population evaluated in the JUPITER trial and the population in this study
2) Describe the incidence of diabetes risk factors in patients taking chronic statin therapy in this study


271 - DESIGN AND IMPLEMENTATION OF A PHARMACIST-DRIVEN DEPRESSION CLINIC IN THE VETERAN AFFAIRS PATIENT ALIGNED CARE TEAMS
B1. Ambulatory Care

Presented by:

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Presenting on Tuesday, May 14 at 5:00 PM in Royal I

Over the past several decades, the Veteran Affairs (VA) hospitals have been a leading example of how a clinical pharmacist can work at the top of his/her license to bring excellent healthcare to the veteran population. Within this system, Clinical Pharmacy Specialists (CPS) have shown their worth in the management of various chronic disease states: diabetes mellitus, hypertension, dyslipidemia, gout, hyperthyroidism, HIV, Hepatitis C, etc. One very large sub-population, that of behavioral health disorders, has been chronically under-served due to insufficient recognition, lack of funding/resources, and a limited supply of qualified healthcare professionals. Whereas many of our troops are now returning from service in Iraq and Afghanistan, the capacity to care for these veterans is limited by available resources and personnel. As with veterans of past wars and foreign conflicts, many of our troops bring home various unwanted reminders of their time in active duty: Post Traumatic Stress Disorder (PTSD), anxiety, depression, pain (physical and emotional), and acquired drug addictions. Many in this population simply cannot cope with these new burdens and resort to physical harm of themselves or others. Yet even with the gravity of this present situation, a veteran must often wait 3 or more months to be seen by a healthcare professional for proper assessment and treatment. For this reason, the role of a CPS has been dramatically expanded to include an advanced scope of practice to help manage many of the above behavioral health disorders via initiation and monitoring of medications used in their treatment. The Spokane VA Medical Center, as with many other VAs, is not quite the size to yet justify the additional expense of hiring a Board Certified Psychiatric Pharmacist (BCPP) to manage the above mentioned growing population. New and innovative ideas are now being implemented to provide more patient access for behavioral healthcare. One such model involves the creation of a pilot ambulatory care clinic, driven by a CPS
and resident pharmacist, to manage mild to moderate depression within the Patient Aligned Care Teams (PACT). The primary objective of this pilot program was to design and implement a clinic to manage the complex regimens of patients with mild to moderate depression. This in turn will alleviate burden from the primary care physicians and prevent unnecessary patients from being shunted to the already overburdened behavioral health specialists. The secondary objectives were to show benefit in time, finance, and efficacy for depression management to allow for the future potential of hiring a full-time BCPP to manage various other aspects of behavior health. The process of designing and implementing, as well as avoiding many potential pitfalls, will be presented.

ACPE #:0126-9999-13-281-L01-P
Learning Objectives:
Explain the process of designing, implementing, and executing a pharmacist-driven depression clinic in the VA PACT setting.
Describe the characteristics of depressed patients that would be most appropriately managed within the VA PACT ambulatory setting.


272 - INITIATION OF A PHARMACIST-RUN DIABETES AND CARDIOVASCULAR PREVENTION PROGRAM AT A RURAL INDIAN HEALTH SERVICE HOSPITAL
B1. Ambulatory Care

Presented by:

Anna Kit, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Sunset V

Purpose:
Nine-hundred and twelve patients are currently on the prediabetes registry at this rural hospital, but the only service available to them is an appointment with a diabetes educator. Over 10 percent of these patients are diagnosed with diabetes each year. The primary objective of this project is to create and implement the Patient Empowered Prevention Program (PEPP), a pharmacist-run patient education initiative that will help manage risks and prevent complications associated with diabetes and cardiovascular disease.

Methods:
Participants will be recruited for this program through the hospital prediabetes registry and referrals received by primary care providers (PCPs). One pharmacist will deliver the 12 course curriculum via weekly one on one and group education sessions. Weight, waist circumference, blood pressure, and direct LDL will be taken at baseline and periodically. Goals for cholesterol and blood pressure will mirror the recommendations for diabetics. Progression to diabetes, HgbA1c and patient satisfaction will be taken at baseline and upon completion. All patients who qualify will be offered metformin and titrated as ordered by the PCP. Patients unable to reach blood pressure and cholesterol goals after six weeks will be evaluated for additional pharmacotherapy intervention. Any change in drug therapy will be discussed with the PCPs prior to initiation or adjustment. Adjustments to blood pressure and cholesterol medications will be tracked as secondary measures. Approval is not required from the institutional board review because it is designed to evaluate the benefit of this service program.
Results/Conclusion:
To be presented upon completion of the program and data collection.

ACPE #:0126-9999-13-282-L01-P
Learning Objectives:
- Describe the implementation of a pharmacist-run diabetes and cardiovascular prevention program.
- Summarize recommended goals for patients with prediabetes.


273 - 24 HOUR VS. 48 HOUR ANTIBIOTIC PROPHYLAXIS OF WOUND INFECTION IN KIDNEY TRANSPLANT PATIENTS
B4. General Clinical Practice

Presented by:
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Presenting on Tuesday, May 14 at 3:30 PM in Royal IV

Post-operative infection rates after kidney transplantation have been reported to range from 10%-56%. This could have a negative impact on patients resulting in graft loss or increase in mortality. Prevention of post-operative infection may help to reduce duration of hospitalization and cost of health care. Since October 1, 2012, Medicare payment has become determined by hospital performance on seven of the Surgical Care Improvement Project (SCIP) measures. SCIP-3 focuses on prophylactic antibiotic discontinued within 24 hours of surgery end time.

The purpose of this retrospective study is to determine whether patients undergoing kidney transplant at Loma Linda University Medical Center had a higher incidence of wound infection if they received prophylactic antibiotics for a duration of 24- versus 48-hours post-surgery. Data will be collected from patient charts for subjects with the following inclusion criteria: (1) Kidney transplant recipients from January 2009 through November 2012 and (2) Kidney transplant recipients greater than 18 years old.

Results and conclusions will be presented.

ACPE #:0126-9999-13-283-L01-P
Learning Objectives:
- Describe wound infection rates in kidney transplant patients receiving 24 hour vs. 48 hour antibiotic prophylaxis.
- Explain the importance of appropriate antibiotic prophylaxis duration post-surgery.


274 - IMPACT OF HIGH INTENSITY DIABETES MELLITUS (HIDM) CLINIC IN PATIENTS WITH POORLY CONTROLLED TYPE 2 DIABETES MELLITUS
A6. Diabetes Care - Diabetes Agents and Devices
Objectives: The primary objective of this study is to determine whether self-efficacy scores are positively correlated with diabetes control in a Veteran population. The secondary objective is to determine whether systolic blood pressure and low-density lipoprotein (LDL) cholesterol are independently correlated with the Veterans’ self-efficacy scores.

Introduction: Diabetes is a complex metabolic disease state that requires involvement from a variety of healthcare professionals as well as intensive self-care from patients. Although diabetes mellitus is diagnosed based on glucose readings, managing the disease is far more complex than simply responding to one’s laboratory values. Traditionally, diabetes has been viewed as a physical illness in which problems and solutions are solved entirely by the provider. More recently, this model has been challenged, with diabetes being viewed as a biopsychosocial illness in which problems and solutions are a shared responsibility between providers and patients. This approach allows Veterans to be proactively engaged in their healthcare while gaining the knowledge and self-efficacy skills needed to self-drive their care. This model of empowerment allows for identifying, reducing, and removing barriers to care while transferring daily diabetes self-care and control to the patient. Self-efficacy—patients’ confidence in being able to manage their diabetes on their own—may be another tool for providers to assess in managing Veterans with diabetes. The purpose of this study is to determine whether self-efficacy scores are associated with better diabetes control as measured by objective markers, and therefore, whether self-efficacy should be assessed as part of routine diabetes management.

Study Design: This is a retrospective, chart based review.

Methodology: Veteran patients invited to participate in the multidisciplinary High Intensity Diabetes Mellitus clinic at the Phoenix VA Health Care System from September 1, 2009 to February 1, 2012 were considered for inclusion. Each visit consisted of appointments with a nurse diabetes educator, nutritionist, pharmacist, nurse practitioner/endocrinologist, and a psychologist. Patients with poorly controlled diabetes were eligible to be enrolled in the clinic if they had a diagnosis of type 2 diabetes mellitus, hemoglobin A1C >9%, and on insulin therapy. Patients answered a two-question survey to assess their perceived ability to self-manage their diabetes. Estimates suggest approximately 200 patients may meet inclusion criteria. Descriptive statistics including frequencies, means and standard deviations, where appropriate, will be used to describe the demographic data. Continuous variables will be evaluated using student’s t-test for paired samples. Primary and secondary endpoints will be evaluated using a Pearson correlation.

Results and conclusion will be presented.

Disclaimer: This study is supported by the Department of Veterans Affairs and is the result of work supported with resources and the use of facilities at the Phoenix VA Health Care System. The investigators are employed through the Phoenix VA Health Care System in Phoenix, AZ. The contents of this study do not represent the views of the Department of Veterans Affairs or the United States Government.

ACPE #:0126-9999-13-284-L01-P

Learning Objectives:

- Describe outcomes following the implementation of the High Intensity Diabetes Mellitus (HIDM) clinic
- Explain a correlation between self-efficacy scores and diabetes mellitus control

Introduction: Diabetes mellitus (DM) is the seventh leading cause of mortality in the United States and increases morbidity up to 6-fold. This is primarily the result of macrovascular and microvascular complications, particularly when the disease is not well-controlled. Combination therapy with oral anti-hyperglycemic agents and/or insulin analogs is often required to achieve the desired HbA1c reduction. The most commonly used oral medications are biguanides and sulfonylureas. Despite optimizing oral combination therapy, only about 58% of patients are able to achieve and maintain adequate blood glucose control. The VA/Department of Defense guidelines for the management of type 2 DM recommend that pioglitazone be considered in patients who are unable to take metformin or a sulfonylurea, but do not provide guidance regarding the addition of pioglitazone to failing metformin-sulfonylurea regimens. Rather, the use of a long-acting insulin analog is suggested when the desired HbA1c is not likely to be achieved with combination oral therapy alone.

Objective: The purpose of this study is to evaluate whether the addition of pioglitazone to dual therapy with maximally tolerated doses of metformin and a sulfonylurea in Veterans with type 2 DM provides a significant HbA1c reduction, and to determine the length of time to initiation of permanent insulin use in this population. Methodology: This research is the result of work supported with resources and the use of the facilities of SAVAHCS, Tucson, AZ. The study is retrospective chart review utilizing the health system’s electronic medical records database for patient identification and data collection. Included in the study are Veteran patients aged 18 to 89 years with a diagnosis of type 2 DM on stable combination therapy of metformin and a sulfonylurea (glyburide, glipizide, or glimepiride) in whom pioglitazone was initiated as add-on treatment. Stable combination therapy is defined as dual therapy with metformin and a sulfonylurea at unchanged doses for at least 6 months prior to receiving pioglitazone. Between August 1, 1999 and July 31, 2009, 229 charts were identified for review. Data to be collected include baseline demographics; HbA1c at initiation, approximately 6 months following initiation and at discontinuation of pioglitazone; average HbA1c per each 12 month period the patient receives pioglitazone; HbA1c at initiation of insulin; adherence to and duration of pioglitazone use; and reasons for pioglitazone discontinuation and/or insulin initiation (i.e. treatment failure, adverse effects). The primary outcome is to determine if the addition of pioglitazone results in at least a 1% HbA1c reduction. Secondary outcomes will evaluate the time to permanent insulin use after addition of pioglitazone, total duration of pioglitazone therapy, adherence to pioglitazone, proportion of patients who achieved HbA1c of < 7%, and safety. The paired t-test will be used for the primary outcome. Descriptive statistics will be used to analyze secondary outcomes.

Results: To be presented.

ACPE #:0126-9999-13-285-L01-P
Learning Objectives:
- Define the magnitude of pioglitazone’s HbA1c-lowering effects in the Veteran population.
- Describe the length of time pioglitazone delays permanent insulin use in the Veteran population.
Introduction:
The VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress recommends selective serotonin reuptake inhibitors (SSRI) or serotonin-norepinephrine reuptake inhibitors (SNRI) as first-line pharmacologic therapy for the treatment of post-traumatic stress disorder (PTSD). They state that there is insufficient evidence for or against the use of a second-generation antipsychotic (SGA) as adjunctive therapy and do not recommend its use as monotherapy for PTSD treatment. Despite this recommendation, many patients are treated with an SGA for the management of PTSD. The guidelines also state that benzodiazepines, commonly used in this patient population, should be avoided because there is a lack of evidence that they provide any benefit. The primary objective of this study is to determine if Veterans diagnosed with PTSD who are currently on an SGA have been treated with an SSRI or SNRI in accordance with the VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress at VA Southern Nevada Healthcare System (VASNHS). The secondary objective of this study is to determine the percentage of this population with current or past history of benzodiazepine use.

Methodology:
To evaluate if patients diagnosed with PTSD and currently taking an SGA have been treated in accordance with the VA/DoD clinical practice guidelines, investigators will retrieve and review data available on the VISN 22 Academic Detailing Portal which comes from the VISN 22 Regional Data Warehouse. The patients in this database consist of those being treated with an SGA solely for PTSD; these patients do not have any co-morbid psychiatric conditions such as schizophrenia, psychosis, or bipolar disorder. All patients in this database at the time of data retrieval will be evaluated. Investigators will review each patient’s chart to determine if they were treated with an SSRI or SNRI prior to initiation of the SGA. Data collection will include: patient name, social security number, SGA use (medication name, average dose, prescriber, date of initiation), SSRI/SNRI use (medication name, average dose, date of initiation, duration of therapy, and adherence rate) prior to initiation of the SGA, as well as current or past history of benzodiazepine use. Appropriate, simple mathematical calculations will be performed to present the results of the data as the average number of SSRI/SNRI(s) trialed prior to the SGA, the percent of patients trialed on two SSRI/SNRIs prior to the SGA, the average dose, duration of therapy, and adherence rate to the SSRI/SNRI, and the proportion of patients treated with a benzodiazepine for PTSD. The data will be collected and analyzed to address the hypothesis that SSRI/SNRI(s) are underutilized for treatment of PTSD at VASNHS.

Results and Conclusion:
Will be presented.
Introduction
Proton pump inhibitors (PPIs) such as omeprazole and pantoprazole are frequently prescribed for gastroesophageal reflux disease, stress ulcer prophylaxis, and as treatment for gastrointestinal bleeds. At Exempla Lutheran Medical Center, about one-third of inpatients are prescribed acid suppressive therapy, which includes PPIs and histamine-2 receptor blockers (H2RBs), such as famotidine and ranitidine. Until recently, PPIs have been regarded as very safe medications with minimal serious adverse effects or health risks. Recent studies have linked the use of PPIs with an increased risk for Clostridium difficile infections and aspiration pneumonia. A study published in JAMA concluded that acid-suppression therapy, particularly PPI therapy, is associated with 30% increased odds of hospital-acquired pneumonia when compared to patients not receiving acid-suppression therapy. In a recent study by Stevens et al (2011), PPI use was found to be an independent risk factor for developing Clostridium difficile infections. Another study by Linsky et al (2010) demonstrated that proton pump inhibitor use during active Clostridium difficile infections resulted in a 42% increase risk of recurrence of infection. Additionally, a recent chart review by Kim et al (2010) identified PPI use as a significant risk for Clostridium difficile recurrence, along with advanced age and low serum albumin. On 2/8/2012, the FDA released a safety communication based on reports from the Adverse Event Reporting System (AERS) and 28 observational studies stating that PPI use may be associated with Clostridium difficile associated diarrhea. The FDA recommended that “patients should use the lowest dose and shortest duration of PPI therapy appropriate to the condition being treated.” In light of this data and FDA recommendations, it is crucial to limit the use of PPIs to patients with an appropriate indication for treatment.

Methodology
This study is a before and after retrospective chart review of adult patients receiving acid-suppression therapy at Exempla Lutheran Medical Center. Pharmacy-generated reports were utilized to identify 250 patients who received acid-suppression therapy (including pantoprazole and famotidine) during February 2012. The indication for therapy, medication administered, duration of therapy, home AST regimen and incidence of Clostridium difficile infections were recorded for each patient. After completion of the initial data collection, the pharmacy department provided the medical staff with education regarding appropriate prescribing and safety concerns of acid-suppression therapy via newsletters, informational posters, formal presentations, and one-on-one conversations. One month after the implementation of education, pharmacy-generated reports will be utilized.
again to identify 250 additional patients who received acid-suppression therapy. The two patient samplings will be compared for rates of appropriate acid-suppression therapy prescribing.

Results
End points that will be evaluated in this study include percentage of patients with appropriate indication for acid suppression therapy, percentage of patients on PPI therapy, percentage of patients on H2RB therapy, and percentage of patients discharged on acid suppression therapy.

Conclusions
To be presented at Western States Conference.

ACPE #:0126-9999-13-287-L01-P
Learning Objectives:
- Describe the risks associated with proton pump inhibitor therapy.
- List techniques for providing educational material to the medical staff.


278 - EXTENDED-INFUSION ZOSYN: AN INVESTIGATION INTO A NOVEL CLINICAL OUTCOME
A1. Infectious Disease - Anti-infective Agents

Presented by:

Ben Kong, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Mission Bay

Introduction
Increasing resistance in gram-negative organisms including Pseudomonas spp., Acinetobacter spp., and extended-spectrum beta-lactamase producing organisms is associated with increased cost, prolonged hospital stay, and decreased survival. Extending the infusion time of beta-lactams can maximize the time above the MIC (PK/PD parameter correlated with efficacy). Limited retrospective studies have shown beneficial effects of extended infusion Zosyn (EI-Zosyn) on length of stay overall and mortality in targeted patient populations with Pseudomonas infections. We will compare EI-Zosyn vs. traditional Zosyn therapy and assess impact on infectious biomarkers if EI-Zosyn is associated with enhanced clinical improvement. In addition, we will compare this novel strategy to traditional dosing and identify potential cost-savings-opportunities.

Methodology
Single center, retrospective chart review from June 2011-2012. Inclusion criteria includes age>18 yo and received Zosyn for ≥48 hrs. Exclusion criteria includes estimated CrCl <20 ml/min, hemodialysis or CVVHD, cystic fibrosis, received extended infusion >24 hrs followed by conversion to traditional dosing, or received traditional dosing >24 hrs followed by conversion to extended infusion (unless failure to traditional Zosyn therapy). Clinical Improvement is assess via biomarkers at treatment Day 3 and Day 5 and Clinical Outcome is assess at the end of Zosyn therapy or patient discharge.

Results (if applicable- if not, please make the appropriate notation) & Conclusion
Collected biomarkers associated with clinical improvement (WBC, 24 hours Tmax, respiratory status, serum creatinine, lactate, vasopressors, and procalcitonin). Secondary outcomes will include length of stay in ICU and
overall hospital stay, cost of Zosyn therapy, days of Zosyn therapy, and days of concomitant and cumulative antibiotic therapy. Results and conclusions will be presented at Western States Conference.

ACPE #:0126-9999-13-288-L01-P
Learning Objectives:
- Describe the pharmacological benefits of extending the infusion of beta-lactams
- Explain the advantages and disadvantages between extended-infusion and traditional dosing of Zosyn


279 - EFFECT OF BUNDLED USE OF SYSTEMATIC BEHAVIORAL PAIN SCORES, INDIVIDUALIZED DOSING AND STANDARDIZED OPIOID DELIVERY, AND CONTINUOUS END-TIDAL CO2 MONITORING ON PROCEDURAL PAIN AND SEDATION IN BURNS PATIENTS
B3. Critical Care

Presented by:
Angela Koo, PharmD
UC Davis Medical Center
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Presenting on Wednesday, May 15 at 1:00 PM in Executive 715

Introduction: Burns patients commonly require frequent procedural interventions that may result in severe pain. Pain management for these patients continuously balances opioid requirements and sedative effects. There are few validated tools to monitor and assess pain, deliver analgesia, and monitor sedative effects in this population/setting. The current practice for the management of analgesia for burn wound dressing changes at UC Davis Medical Center (UCDMC) is to administer fentanyl push via a syringe. Further, there is no standardized dosing regimen or method used to assess a patient’s level of pain throughout these procedures. The objective of this study is to evaluate the effects of systematic behavioral pain assessment (CPOT), clinician-controlled standardized and individualized analgesic dosing, end-tidal monitoring on procedural pain in burns patients.

Methodology: Subjects will be identified based on their admission to the Burns Intensive Care Unit (ICU). Subjects will be excluded for the following: the estimated drug requirement between dressing varies greater than 25%; a surgical procedure is planned between dressing changes; less than 72 hours has passed since a surgical procedure; and a period of greater than 96 hours lapses between dressing changes. Each subject will serve as his/her own control in a cross-over design. Subjects will first be observed by a pharmacist during a dressing change without any intervention other than end-tidal CO2 monitoring (without RN education). In a subsequent procedure the bundled interventions (i.e. systematic CPOT, individualized dosing and standardized opioid delivery, and end-tidal CO2 monitoring) will be employed. Each subject’s level of pain will be assessed with the CPOT for both methods. Secondary outcome measures include burn-specific pain anxiety scale scores, numeric pain rating scale, systolic blood pressure, respiratory rate, heart rate, and end-tidal CO2 (in non-ventilated subjects). Demographic and burn wound data will also be collected.

Results and conclusions will be presented.

ACPE #:0126-9999-13-289-L01-P
Learning Objectives:
Describe the Critical-Care Pain Observation Tool and its utility in assessing pain in critically ill patients. Explain the benefits of using a clinician-controlled device vs. intermittent push dosing for procedural analgesia in the setting of burn wound dressing changes.


280 - PHARMACIST-DRIVEN SCREENING PROCESS FOR THE IDENTIFICATION OF CORONARY HEART DISEASE AND INITIATION OF LIPID MANAGEMENT

B1. Ambulatory Care

Presented by:

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Presenting on Wednesday, May 15 at 9:30 AM in Sunset V

Purpose: Pharmacist-managed lipid clinics have been developed to effectively manage lipid-lowering therapy; however, the pharmacist’s ability to identify patients with coronary heart disease (CHD) risk and initiate therapy has not been examined. Current National Cholesterol Education Program (NCEP) Adult Treatment Panel III guidelines recommend utilizing CHD risk factors such as age, hypertension, family history and tobacco use to estimate a patient’s CHD risk. If a patient has two or more CHD risk factors then it is recommended to use the Framingham risk calculation to determine a 10-year risk equivalent. The purpose of this project is to implement and describe a pharmacist-driven screening process at Harborview Family Medicine Clinic (HFMC) to identify a patient’s risk for CHD and to recommend optimal initiation of statins.

Methods: The current study is an observational, single-center, non-randomized study describing a pharmacist-driven screening process for the identification of patients with high risk for CHD and recommendations for statin therapy within the HFMC. All patients between the ages of 20 to 80 with a scheduled appointment in the HFMC from November 1, 2012 to February 28, 2013 will be screened to identify those with 2 or more CHD risk factors and to determine a Framingham 10-year risk score. Screening by the pharmacist will occur prior to the patient’s scheduled appointment and recommendations for lipid monitoring or statin initiation will be provided to the patient’s physician. Patient data necessary for screening will be obtained from electronic medical records. The primary outcome measures are the identification of high 10-year CHD risk, pharmacist recommendations for statin therapy initiation, and pharmacist recommendations for lipid panel monitoring.

Results: The results of this investigation are currently pending. IRB approval has been obtained and data collection is currently being conducted

Conclusion: The role of primary care clinical pharmacists leading this process can emphasize the importance of utilizing CHD risk factors and Framingham risk scores prior to implementing pharmacological therapy.

ACPE #:0126-9999-13-290-L01-P
Learning Objectives:

- Describe the impact of a pharmacist-driven screening process for the identification of coronary heart disease within a primary care clinic.
- Explain the use of CHD risk factors and Framingham risk scores for initiating lipid management.

281 - USE OF PARENTERAL ANTICOAGULATION FOR THE TREATMENT OF ACUTE VENOUS THROMBOEMBOLISM, A DESCRIPTIVE STUDY; THE PAVE STUDY

B1. Ambulatory Care

Presented by:

Emily Kosirog, PharmD
Kaiser Permanente Colorado PGY2 Ambulatory Care
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Presenting on Wednesday, May 15 at 10:00 AM in Sunset V

Introduction: While the American College of Chest Physicians (ACCP) guideline provides recommendations for the use of anticoagulation in the treatment of acute venous thromboembolism (VTE), controversy still remains regarding the use of injectable anticoagulants in the setting of obesity, severe renal insufficiency, and dose rounding. Limited studies describe real-world adherence to these guidelines, or how these special populations are addressed in clinical practice. Our study aims to describe the quality of anticoagulation therapy management by the Clinical Pharmacy Anticoagulation and Anemia Service (CPAAS) at Kaiser Permanente Colorado (KPCO) with adherence to ACCP recommendations. By further defining the use of parenteral anticoagulants in clinical practice, we ultimately hope to improve the safety and efficacy for all future patients receiving therapy.

Methodology: This retrospective cohort study examines patients receiving anticoagulation for a new diagnosis of VTE between 01/01/2010 and 12/31/2011. Chart review will be performed to verify the type and dose of the parenteral anticoagulant administered, duration of overlap with warfarin therapy (where applicable), renal function, weight, and concomitant use of antiplatelet agents. Incidence of recurrent VTE or clinically relevant hemorrhage within 90 days of VTE diagnosis will be reviewed. These results will be compared to the 2008 ACCP Venous Thromboembolism Guidelines.

Results/Conclusion: Preliminary results will be presented at conference.

ACPE #:0126-9999-13-291-L01-P

Learning Objectives:
- Describe the quality of anticoagulation therapy management in the treatment of acute VTE by the Clinical Pharmacy Anticoagulation and Anemia Service (CPAAS) at KPCO with adherence to the ACCP Venous Thromboembolism Guidelines.
- Describe the use and outcomes of parenteral anticoagulants for the treatment of acute VTE in patients with obesity, severe renal insufficiency, or where dose rounding may be considered in a real-world clinical setting.


282 - DESCRIPTION OF LONG-TERM BISPHOSPHONATE THERAPY IN POSTMENOPAUSAL WOMEN IN A PRIMARY CARE SETTING

B1. Ambulatory Care

Presented by:
Introduction:
Bisphosphonates are widely prescribed for the treatment and prevention of osteoporosis. Due to the potential for adverse effects with bisphosphonate therapy, some have advocated for a period of time off of therapy or a "drug holiday" for certain patients. This recommendation has been supported by the finding that bisphosphonates can accumulate in the bone leading to a reservoir of medication that is released for months or years after the discontinuation of therapy. As a result, appropriate treatment duration and implementation of a drug holiday continues to be a topic of uncertainty. Guidelines do not provide a clear recommendation on drug holidays and point to an evaluation of the patient’s risk of fracture. Current literature provides a limited description of fracture risk for patients receiving long-term bisphosphonate therapy. The primary outcome of this study is to determine the prevalence of postmenopausal women on long-term bisphosphonate therapy that fall into one of four fracture risk categories (low, mild, moderate, high). The secondary outcomes include the prevalence of women that may be eligible for a drug holiday, estimated cost savings when eligible for a drug holiday, and the rate of accurate documentation for calcium and vitamin D supplementation.

Methodology:
This is a retrospective, observational medical record review evaluating postmenopausal women prescribed long-term bisphosphonate therapy at University of Colorado Hospital Outpatient Clinics between 10/1/2002 – 9/30/2012. Women aged 55-89 years old or younger with a diagnosis of postmenopause, with at least 4 years of continuous bisphosphonate therapy and having a diagnosis of osteopenia or osteoporosis will be included. Patients receiving bisphosphonate therapy for an indication other than osteoporosis or osteopenia will be excluded. Data to be collected will include patient demographics, information related to risk factors for fracture (e.g., smoking history, alcohol consumption), bisphosphonate therapy and duration, diagnosis for treatment with a bisphosphonate, DXA scan results, and calcium and vitamin D supplementation. Descriptive statistics will be used to analyze baseline characteristics and study outcomes.

Results and Conclusion:
Will be presented.

ACPE #:0126-9999-13-292-L01-P
Learning Objectives:
- Describe risk stratification for fracture in a postmenopausal primary care population.
- Explain patient characteristics that may make a postmenopausal woman on bisphosphonate therapy eligible for a drug holiday.


283 - IMPACT OF INTRAVENOUS FAT EMULSION SHORTAGE ON ADULT PARENTERAL NUTRITION PATIENTS
A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:
Alexander Koudelka, PharmD
Renown Regional Medical Center
akoudelka@renown.org

Presenting on Tuesday, May 14 at 10:30 AM in Mission Bay Foyer

Introduction: Intravenous fat emulsion (IVFE) is one of the primary macronutrient components used to formulate parenteral nutrition (PN) solutions. Provision of lipids through IVFE in PN creates more balanced nutrition, and its high caloric density is beneficial in creating PN formulations for fluid restricted patients. At Renown Regional Medical Center, IVFE is regularly used to formulate PN. In October 2009, a critical shortage of IVFE inspired a temporary change in the policy, restricting daily use to neonates, children and adults meeting predetermined criteria, and limiting administration to bolus therapy after 7-14 days of PN for patients not meeting criteria. These restrictions remained in place until resolution of the shortage in July 2011. The objective of this study is to assess whether the IVFE shortage and related policy change resulted in unfavorable effects for adult patients receiving PN.

Methods: This observational study was initiated following Institutional Review Board approval. The Renown Regional Medical Center electronic medical record was retrospectively analyzed to identify adult patients receiving PN from May to October 2010, during the IVFE shortage, and from May to October 2012, after its resolution. Patients included were those adhering to IVFE protocols during the respective time periods. Exclusion criteria included patients who were less than 18 years of age, pregnant, receipt of peripheral, cyclic and home PN, concurrent propofol, and protein restriction due to hepatic encephalopathy or renal insufficiency. Patient demographic information, macronutrient content of PN, glucose readings, serum triglycerides, insulin use and blood culture results were collected. Average blood glucose and insulin use was calculated for each patient. The primary endpoint of the study evaluated glycemic control in patients through comparison of average glucose and incidence of hyperglycemia (glucose ≥150 mg/dL). Secondary outcomes compared incidence of bloodstream infections identified by positive cultures after PN initiation, and insulin utilization. Results and Conclusion: To be presented

ACPE #:0126-9999-13-293-L01-P
Learning Objectives:
- Explain the importance of intravenous fat emulsions in parenteral nutrition
- Describe the American Society for Parenteral and Enteral Nutrition recommendations for management of an intravenous fat emulsion shortage


284 - INTERMITTENT VERSUS CONTINUOUS INFUSION OF 3% HYPERTONIC SALINE IN REDUCTION OF INTRACRANIAL PRESSURE
B3. Critical Care

Presented by:
Jamie Kuo, PharmD
Stanford Hospital and Clinics
jkuo@stanfordmed.org

Presenting on Tuesday, May 14 at 8:00 AM in Executive 715
Introduction:
Hypertonic saline (HTS) has gained acceptance as the preferred hyperosmolar therapy based on its favorable hemodynamic profile and emerging evidence supporting its efficacy in reducing intracranial pressure (ICP). However, the optimal dosing strategy of HTS solutions remains to be elucidated.

Methods:
This retrospective study compares intermittent versus continuous infusion of HTS in reduction of ICP during the initial 24 hours of hyperosmolar therapy. The study protocol was approved by the institutional review board. Adult patients admitted between January 2009 and July 2012 after non-traumatic subarachnoid hemorrhage (SAH) and/or intracranial hemorrhage (ICH) were included if an external ventricular drain was placed and 3% HTS was administered in an ICU setting. Exclusion criteria were patients who received both intermittent and continuous infusion of 3% HTS at any point during the initial 24 hours of HTS therapy, baseline serum sodium <120 mmol/L, administration of HTS volumes other than 250 mL as an intermittent infusion, and less than two recorded ICP measurements during the initial 24 hours of HTS therapy. Baseline patient characteristics collected from chart review include age, gender, Glasgow Coma Score on admission, serum sodium, serum creatinine, and requirement of mechanical ventilation within 24 hours of admission. For patients with SAH, type (aneurysmal vs non-aneurysmal), Hunt and Hess grade, and Fisher scale were recorded. For patients with ICH, ICH score was calculated. Hourly ICP and serum sodium values were collected for 24 hours beginning from the time HTS was first administered. Efficacy endpoints will include proportion of ICP values less than 20 mmHg and change in serum sodium from baseline.

Results and conclusions will be presented.

ACPE #:0126-9999-13-294-L01-P

Learning Objectives:
- Describe the use of 3% hypertonic saline in management of elevated intracranial pressure in patients with subarachnoid hemorrhage and intracranial hemorrhage.
- Describe dosing strategies of 3% hypertonic saline administered as an intermittent versus continuous infusion in reduction of elevated intracranial pressure.


285 - DEVELOPING A NEW PGY2 AMBULATORY CARE RESIDENCY: OUR EXPERIENCE AND CHALLENGES IN THE FIRST YEAR

B1. Ambulatory Care

Presented by:

**Hussam I. KUTBI, PharmD**
The University of Arizona-Medication Management Center
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*Presenting on Wednesday, May 15 at 9:00 AM in Sunset V*

Introduction:
Residencies in pharmacy are defined by the American Society of Health-system Pharmacists as a structured, directed, salaried, postgraduate training program in a defined area of pharmacy practice, typically lasting one year. The entry level in this field of training is usually the postgraduate year 1 (PGY1) pharmacy practice residency, which includes general training in various areas in hospital, community and ambulatory care settings.
In addition, there is the postgraduate year 2 (PGY2) residency, which is geared toward those who are interested in continued training in a specialty area of practice. More recently, an increased number of jobs require residency training to either expand clinical services or to establish new care models. In 2012, there was a 13% increase in PGY1 candidates and a 25% increase in PGY2 candidates from the previous year. About 1400 PGY1 candidates applied and did not obtain a residency position in 2012.

With this high level of competition in obtaining residency training, and the driving need for well-trained clinicians, preceptors, and faculty, arises the need for more residency programs in general and more advanced training programs in specialty areas of practice. Furthermore, the evolving role of pharmacy practice coupled with the push of pharmacy organizations to establish or expand pharmacy residency programs, encourages the development of innovative specialty residency programs that support a new era in pharmacy practice.

One of those areas of specialty pharmacy practice is ambulatory care. According to the board of pharmaceutical specialties, ambulatory care pharmacy practice is defined as the provision of integrated, accessible health care services by pharmacists who are accountable for addressing medication needs, developing sustained partnerships with patients, and practicing in the context of family and community. Ambulatory care residents are trained to provide direct patient care as primary providers in pharmaceutical care for many disease states, serve as patient advocates, promote wellness and health, and educate patients. They also develop leadership skills by working in clinics independently and with other healthcare professionals in ambulatory care settings.

Ambulatory care residency programs ensure graduates are qualified to pursue advanced credentialing such as board certification in ambulatory care (BCACP).

Due to the previously mentioned demands for residency as well as legislative implications on the healthcare system and newer patient care models, we decided to pursue an innovative model for our PGY2 ambulatory care residency at the Medication Management Center (MMC). The MMC is part of the University of Arizona College of Pharmacy and is a first-of-its kind pharmacist-run center providing phone-based ambulatory care services. The MMC’s services are currently provided for over 2 million patients nationwide.

Methodology:
This concurrent, descriptive, observational review is being conducted at the MMC. Data will be presented from the first 9 months of the residency program (June 2012-April 2013) through working closely with the program director to review existing residency documents, create new learning experiences and discuss challenges.

Our primary objective is to describe our new PGY2 ambulatory care residency program and discuss challenges in the first year.

Discussion, and Conclusion: Will be presented

ACPE #:0126-9999-13-295-L01-P
Learning Objectives:
- Describe innovative components of our PGY2 ambulatory care program.
- Discuss residents' challenges in the first year.

Presenting on Wednesday, May 15 at 11:30 AM in Sunset V

Introduction:
Health care delivery is currently challenged by demands of quality and access. Health care reform and the individual mandate for all U.S. citizens and legal residents to have health coverage by January 1, 2014 will cause a rise in the number of patients seeking care from primary care providers. The increase in demand for patient care and reduced supply of primary care providers will stress the current healthcare system further and can ultimately impact the quality of patient care. This pressure has created a need for healthcare professionals who can fulfill primary care roles. Clinical pharmacists can be integrated in the primary care setting to fill this gap by providing multiple patient care services including, but not limited to, chronic disease state management and support for medication-related questions by the primary care team. The purpose of this study is to implement a 3-month pilot pharmacy service in the primary care setting at Kaiser Permanente, San Diego and to evaluate its effectiveness.

Methodology:
This is a pre- and post-intervention database review study that evaluates the impact of implementing clinical pharmacy services in the primary care setting. After the development of a pharmacy protocol and daily workflow, the pilot program integrated two experienced ambulatory care pharmacists in the primary care setting for three months from November 2012 through the end of January 2013. Due to the brief duration of the pilot and limitations in laboratory follow-up, efficacy was measured using the primary endpoint of percentage of hypertension patients at a blood pressure goal of <140/90. Using the electronic medical record and an online performance reporting tool of Kaiser Permanente, blood pressure measurements were identified before and after pharmacist intervention for comparison. Patients included in the study were adult Kaiser Permanente members diagnosed with hypertension and cared for by Primary Care. Descriptive statistics will be used to determine whether blood pressure control was improved as a result of the pharmacy service implementation.

Results and conclusions will be presented.

ACPE #:0126-9999-13-296-L01-P
Learning Objectives:
Explain the methods used for successful implementation of a clinical pharmacist in the primary care setting.
Describe the outcomes following the implementation of a clinical pharmacist in the primary care setting.


287 - IMPLEMENTING CLINICAL PHARMACY SERVICES IN THE EMERGENCY DEPARTMENT AT A COMMUNITY HOSPITAL
B4. General Clinical Practice

Presented by:
Carla Kwon, PharmD
Highline Medical Center
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Presenting on Tuesday, May 14 at 4:00 PM in Royal IV
Introduction: Highline Medical Center is a 239-bed community hospital located in Burien, Washington. The emergency department (ED) is comprised of 32 private beds and provides 24-hour care to 60,000 patients each year. It is a primary cardiac and stroke center and a level IV trauma facility. At Highline Medical Center, over 90% of all hospital admissions are admitted through the emergency department. The emergency department is often a chaotic environment with the highest rate of preventable adverse events. Many studies have demonstrated the value of having an ED pharmacist by reducing the number medication errors, adverse events, and improving coordination of patient care. Our current staffing model does not include an ED pharmacist position. However, preliminary retrospective data from Highline Medical Center has shown a 30% reduction in medication errors related to admission medication reconciliation when a pharmacist was involved in the process. The purpose of this project was to create a clinical pharmacist position tailored to the medical services provided by Highline Medical Center.

Methods: Institutional Review Board (IRB) approval was not needed for this project due to the quality improvement platform. A survey of clinical pharmacy interventions from local ED pharmacist positions and published literature were obtained and used to assess the standard of practice for ED pharmacists at Highline Medical Center. These interventions included all of the following: clinical consults, pharmacy managed collaborative practice protocols, patient education, nursing/physician education, order screening and/or verification, dispensing medication, preparing medications, pharmacy resident training, resuscitation response, participation in other emergent situations, and a large emphasis on medication reconciliation. Post implementation data collection includes a separate electronic tracking system for the total number of clinical interventions, medication errors related to admission medication reconciliation, and areas for process improvement. The results of the post implementation data will assess the cost effectiveness and justify the return on investment for the ED pharmacist position.

Results/Conclusions: Results and conclusions will be discussed.

ACPE #:0126-9999-13-297-L04-P
Learning Objectives:
- List five clinical responsibilities of an emergency department pharmacist at a community hospital.
- Describe areas of improvement and/or expansion of pharmacy services in the emergency department.


288 - PHASE II: INDIAN HEALTH SERVICE COUNSELING MODEL IN THE COMMUNITY SETTING

B2. Community Practice

Presented by:

Naomi Lam, PharmD
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Presenting on Tuesday, May 14 at 10:00 AM in Sunset V

Introduction: It was estimated in 2005 that almost 1 out of 2 adults in America had at least one chronic disease; and pharmacists serve as the last important checkpoint before medications are dispensed to more than 133 million of these patients in the community setting.1 Surprisingly, the rate of counseling was decreased significantly from 43% to 27% in the community pharmacy setting (p=0.05).2 While this can be a multifaceted problem, our study aimed to focus on counseling techniques, an aspect that has been known to increase...
adherence levels up to 83%,3 which was crucial in chronic medication therapy. It has been 22 years since counseling was mandated for new medications; but no study has been conducted to define an effective and efficient way to counsel patient. Based on previous findings from our pilot study,4 there was a significant difference in knowledge gap between those patients who were counseled using the Indian Health Services (IHS) method versus patients who were counseled using the traditional method (p<0.0001) in the community pharmacy setting. The second phase of this study aimed to determine the effectiveness and efficiency of the traditional counseling method versus the Indian Health Services counseling method.

Methodology: A prospective, non-randomized, second phase study took place at different local community pharmacies in Oregon based on their willingness to participate. The pharmacists did not alter their current counseling styles at their respective pharmacies. Prior to the initiation of the study, two sites were selected as the intervention group which used the existing IHS counseling method; while other sites served as the control sites since the pharmacists used the traditional method of counseling. In the control groups, patients were provided with verbal and/or written information containing the name of the drug, how to take it, and possible side effects. Intervention group participants were counseled with the IHS counseling model, also known as the three prime questions. During each counseling encounter, the duration of counseling was recorded to assess efficiency of each method of counseling. A post-counseling interview also took place to assess effectiveness of each counseling method.

Results: At the time of abstract submission, the primary investigator was still in the process of data collection. The results and conclusion will be presented at Western States.

Conclusion: The conclusion will be presented at Western States.

References:

ACPE #:0126-9999-13-298-L01-P

Learning Objectives:
- Describe the effectiveness of the Indian Health Services counseling method in comparison to the traditional one-way counseling method.
- Describe the efficiency of the Indian Health Services counseling method and the traditional one-way counseling method.


289 - IMPLEMENTATION OF A PHARMACIST MANAGED ORAL CHEMOTHERAPY SERVICE IN THE OUTPATIENT SETTING

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Angel Lam, PharmD
Kaiser Permanente Oncology Pharmacy Residency Program
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Presenting on Tuesday, May 14 at 4:30 PM in Sunset I

Introduction: The steady increase of oral chemotherapy use and the rapid rise of novel agents in the marketplace require healthcare organizations to take innovative steps to maximize patient safety and reduce cost. One such innovation is utilizing oncology pharmacists in monitoring patients on oral chemotherapy. Oncology pharmacists are trained to provide effective medication education to patients and to assist healthcare providers in medication therapy management. In current practice at Kaiser Permanente San Diego ambulatory care setting, oncologists are responsible for the primary diagnosis, overseeing oral chemotherapy, and management of any treatment-related events. The implementation of a pharmacist-managed oral chemotherapy service will allow oncologists to focus on primary diagnosis and disease management while oncology pharmacists spend time on monitoring and managing patients on oral chemotherapy.

Methodology: The pharmacist-managed oral chemotherapy service will be piloted in the outpatient setting and effectiveness will be compared before and after the implementation. This service will provide laboratory monitoring of patients who are currently on selected oral chemotherapeutic agents. The oncology pharmacists will assess patient tolerance through telephone interview, monitor regimen toxicity based on laboratory parameters, and provide recommendations for dose modifications. Patients with an active prescription of a study drug, (imatinib, dasatinib, nilotinib, sorafenib, sunitinib, or abiraterone) during the study period are included in the analysis. Patients who are younger than 18 years of age, enrolled in clinical trials, or pregnant are excluded in this study.

Results/Conclusion: The principal investigator will retrospectively collect data before the implementation of a pharmacist managed oral chemotherapy service and prospectively collect data after the implementation of the service. The Fisher's exact test will be performed to compare the outcomes based on the number of missing recommended laboratory tests and the number of incomplete laboratory tests before and after the implementation of the pharmacist-managed oral chemotherapy service. The results of this study may support expanding the role of oncology pharmacists in managing patients on oral chemotherapy to minimize treatment-induced toxicity and improve patient compliance. Results and conclusions will be discussed.

ACPE #:0126-9999-13-299-L01-P
Learning Objectives:
List potential targeted therapy-induced toxicities.
Describe the implementation of an oncology pharmacist-managed oral chemotherapy service


290 - EVALUATION OF VANCOMYCIN PHARMACOKINETICS AND PHARMACODYNAMICS IN MORBIDLY OBESE PATIENTS COMPARED TO NON-OBESE PATIENTS
A1. Infectious Disease - Anti-infective Agents

Presented by:
Kristin Lambert, PharmD
Exempla Good Samaritan Medical Center
Vancomycin has been used for over 50 years in the treatment of infections caused by gram positive organisms. Despite its history of use, there remains a lack of pharmacokinetic and pharmacodynamic clinical data to support the currently recommended dosing regimen of 15-20 mg/kg every 8-12 hours for morbidly obese patients. The primary objective of this project is to compare the pharmacokinetic and pharmacodynamic profile of vancomycin serum levels in morbidly obese patients compared to non-obese patients. The secondary objective is to perform predicted calculations based on current Infectious Disease Society of America (IDSA) recommended dosing and trough goals for each patient and compare these values with actual serum levels in an attempt to reveal plausible causes for the variability observed in the morbidly obese population. Patients are considered for inclusion if they are ≥18 years of age with a body mass index (BMI) of ≥ 35 or ≤ 29 kg/m², and receiving intravenous vancomycin dosed at 15-20 mg/kg, rounded to the nearest 250 mg dose, with a maximum of 2000 mg/dose for at least 3 doses. Patients are excluded if they are unable to consent, pregnant, have creatinine clearance of < 30 ml/min or have unstable renal function defined as a change in serum creatinine concentration of ≥ 0.3 mg/dL during the first 48 hours of vancomycin administration. Upon consent, patients meeting inclusion and exclusion criteria will have one measured pre-dose (trough) serum vancomycin concentration and two post-distributional measured serum vancomycin concentrations. Measured serum levels are used to calculate area under the curve (AUC), volume of distribution (Vd), elimination rate (k), clearance (CL) and elimination half-life (T½) of vancomycin. Predictive pharmacokinetic calculations will also be performed based on population kinetics and current IDSA dosing and compared with calculations based on actual serum levels in both groups. The resulting calculations will be used to compare the differences in parameters between morbidly obese patients and non-obese patients. By comparing the two groups and filling this gap in knowledge, more adequate dosing strategies might be revealed.

ACPE #:0126-9999-13-300-L01-P
Learning Objectives:
- Explain the limitations of vancomycin dosing in the morbidly obese population
- Explain the pharmacokinetic calculations used to derive patient-specific parameters


291 - THE IMPACT OF A PRIMARY CARE PHARMACIST-LED MEDICATION ADHERENCE SERVICE ON CARDIOVASCULAR DISEASE OUTCOMES
B1. Ambulatory Care

Presented by:

**Pio Juan Lansangan, PharmD**
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*Presenting on Wednesday, May 15 at 1:00 PM in Sunset V*

Introduction: Non-adherence to treatment regimens is a continuing challenge for healthcare practitioners. Kaiser Permanente Southern California has developed an electronic medication adherence tool that is reported in the patient’s medical record and available to run outreach queries, which is called the medication refill...
adherence ratio (MRAR) tool. This tool measures the patient’s medication adherence based on their prescription refills over the past 540 days and is calculated as number of days supplied divided by the number of days elapsed. A MRAR score of less than 70% indicates possible non-adherence that warrants further discussion with the patient to identify if it is accurate, what are the barriers causing their non-adherence and to work with them on possible solutions. Methods to support our physicians using the MRAR tool were developed and tested by our primary care pharmacists and surrogate outcomes of disease control were measured post pharmacist consultation with the patient.

Methodology:
1. Developed a medication adherence consultation (MAC) provided by primary care pharmacists for non-adherent, uncontrolled hypertension (HTN) patients who are treated with any antihypertensive medication and/or coronary artery disease (CAD) patients who are treated with any hyperlipidemia medication.
2. Developed a referral process for healthcare professionals to primary care pharmacists to conduct a telephonic or in-person MAC.
3. Developed an outreach process for the primary care pharmacists to identify patients who are non-adherent and have uncontrolled HTN treated with any antihypertensive medication and/or CAD treated with any hyperlipidemia medication utilizing the MRAR tool.
4. Developed a primary care pharmacist workflow to incorporate MAC services into their existing patient care responsibilities.
5. Conducted a preliminary, retrospective, quasi-experimental, before and after study analysis of patients who received MAC services from January 28, 2013 to February 22, 2013. The analysis includes before and after comparison of surrogate outcomes of disease control for HTN treated with any antihypertensive medication (blood pressure (BP) ≤ 140/90) and/or CAD treated with any hyperlipidemia medication (low-density lipoprotein (LDL) ≤ 100, high-density lipoprotein (HDL) ≥ 40 in males, HDL ≥ 50 in females, total cholesterol (TC) ≤ 200, and/or triglycerides (TG) ≤ 150).

Results: To be determined. Metrics to be reported:
• 1 BP readings reviewed 2-4 weeks apart after the initial MAC.
• 1 LDL, HDL, TC, and/or TG readings reviewed 4-6 weeks after the initial MAC.

Conclusion: To be determined.

ACPE #:0126-9999-13-301-L01-P
Learning Objectives:
Describe the processes and methods involved in developing a medication adherence consultation service by primary care pharmacists.
Explain the barriers and challenges in improving patient adherence issues and outcomes.


292 - EFFICACY OF CALCIUM AND MAGNESIUM TO REDUCE THE INCIDENCE OF OXALIPLATIN-RELATED NEUROTOXICITY
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Rebecca Lau, PharmD
Stanford Hospital & Clinics
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Presenting on Tuesday, May 14 at 5:00 PM in Sunset I
Background
Oxaliplatin is a key component of standard colorectal cancer regimens. Treatment is often affected by oxaliplatin-related neurotoxicity as it leads to dose reduction, treatment delay, and discontinuation of oxaliplatin in adjuvant and palliative settings. Data supporting the use of magnesium and calcium to reduce incidence of oxaliplatin-related neurotoxicity is conflicting. The purpose of this study is to determine whether calcium and magnesium supplementation is effective in prevention of oxaliplatin-related neurotoxicity.

Methods
A retrospective analysis of all patients with colon cancer who received oxaliplatin-based treatment at Stanford Hospital and Clinics between September 2010 to September 2012 was performed. Due to a drug shortage, calcium and magnesium supplementation was restricted between September 2011 to September 2012. Thus, patients were compared between the two years for differences in oxaliplatin-related neurotoxicity. The primary endpoint is the percentage of patients with neurotoxicity at any time during or after oxaliplatin treatment. Secondary endpoints include the grade of neurotoxicity, the incidence of treatment reduction, and the total dose and cycles of oxaliplatin received.

Results
Results and conclusion to be reported upon completion of study

ACPE #:0126-9999-13-302-L01-P

Learning Objectives:
- Describe the evidence behind the use of magnesium and calcium supplementation for prevention and/or treatment of oxaliplatin related neurotoxicity
- Explain the variability in presentation of neurotoxicity caused by oxaliplatin.


293 - EVALUATION OF MEDICATION RECONCILIATION AND PATIENT RISK FACTORS FOR MEDICATION DISCREPANCIES AT A CHILDREN’S HOSPITAL

D1. Medication Safety

Presented by:
Kara Lau, PharmD
Children's Hospital Central California
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Presenting on Tuesday, May 14 at 5:00 PM in Palm I

Introduction: Medication errors frequently occur at the time of hospital admission and transition of care due to an incomplete or inaccurate medication history. The Joint Commission has recognized medication reconciliation as a National Patient Safety Goal (NPSG 03.06.01) and urges organizations to develop procedures to collect patient medication information. Literature states that having ≥ 4 pre-admission prescription medications is a risk factor for clinically important discrepancies among the pediatric population. Since the implementation of a medication reconciliation process at Children’s Hospital Central California, there has not been an evaluation for procedure effectiveness or thoroughness. Methods: The purpose of this study is to identify patient risk factors for medication discrepancies in a children’s hospital. Identification of risk factors will assist pharmacists in prioritizing which patients will most likely benefit from medication reconciliation. This is a prospective, randomized study of 200 pediatric patients admitted between November 2012 and March 2013. A pharmacist
without prior knowledge of the patient’s home medications will interview the parent/patient within 48 hours of admission using a standard interview form. Medication information collected by the pharmacist will be compared with hospital admission orders and information obtained by a non-pharmacy staff member, which is the hospital’s current practice. Discrepancies will be quantified by type (drug name, dose, frequency, addition, omission) and categorized as intentional, unintentional, documented, or undocumented. To identify risk factors for medication discrepancies, patient demographics including age, number of prescription medications, patient/parent’s primary spoken language, admission diagnosis, and admitting hospital unit will be collected. Statistical analysis will include chi-square test and ANOVA. IRB approval was obtained. Parent/legal guardian and patient (if ≥ 7 years old) consent was obtained prior to inclusion in the study. Results and conclusions will be presented and discussed.

ACPE #:0126-9999-13-303-L05-P

Learning Objectives:

- List the types of questions that need to be asked to reveal medications that are frequently forgotten when gathering a medication history.
- Describe patient risk factors for medication discrepancies in the pediatric population.


294 - ASSESSMENT OF NURSE-DRIVEN, WEIGHT-BASED HEPARIN DRIP PROTOCOL BEFORE AND AFTER INTENSIFIED PHARMACIST MONITORING PILOT

B4. General Clinical Practice

Presented by:

Jessica Lau, PharmD
University of California, San Diego
jwlau@ucsd.edu

Presenting on Tuesday, May 14 at 4:30 PM in Royal IV

Purpose:
To evaluate adherence to the nurse-driven, weight-based heparin drip protocols before and after implementation of intensified pharmacist monitoring pilot at University of California San Diego Health System.

Background:
As part of the 2012 Hospital National Patient Safety Goals, the Joint Commission has stated that hospitals should use approved protocols for the initiation and maintenance of anticoagulant therapy. The Joint Commission recommends each hospital evaluate anticoagulation safety practices, take action to improve practices, and measure the effectiveness of those actions. The University of California San Diego (UCSD) Health System currently has two weight-based intravenous unfractionated heparin protocols managed by nursing with dose adjustments based on aPTT values. Increased adherence to these heparin protocols should reduce the amount of potential risk factors for bleeding events and recurrent thrombotic disease. At UCSD, heparin continues to result in a high number of medication error reports per patient exposure to heparin. Standardizing heparin administration through adherence to the current weight-based protocols continues to be a goal at UCSD Health System in order to improve the safety and efficacy of intravenous unfractionated heparin.

Methods:
The pharmacist monitoring pilot consists of intensified pharmacist involvement at the point of verification for baseline labs, appropriate indication, appropriate bolus, and appropriate initial rate according to the protocols.
The resident will conduct once daily monitoring of all patients on heparin drips for appropriate adherence to protocol after the point of verification. The resident will evaluate patients initiated on heparin protocol for any indication from July to September 2012 for control group and December 2012-February 2013 during the pharmacist monitoring pilot. Patient demographics (age, gender, height, weight, BMI, creatinine clearance, baseline INR, baseline aPTT), risk factors for bleeding, risk factors for clotting, indication for heparin therapy, all aPTT values while on UFH, adherence based on protocol, and bleeding events will be collected through retrospective chart review via the electronic medical record. The primary endpoint is adherence to the heparin protocol at the point of verification defined as baseline labs ordered and appropriate indication, bolus and initial rate per protocol. The secondary endpoints are to evaluate the safety and efficacy of the heparin protocol in UCSD Health System and time required for enhanced pharmacist monitoring of heparin.

ACPE #:0126-9999-13-304-L01-P
Learning Objectives:
- Describe appropriate use of the nurse driven, weight based heparin protocols.
- Explain the difference between the effectiveness of the heparin protocols before and after an intensified pharmacist monitoring pilot.


295 - IMPLEMENTATION OF CLINICAL PHARMACY SERVICES IN A COMMUNITY TERTIARY-CARE EMERGENCY DEPARTMENT (ED): A PILOT PROGRAM
B4. General Clinical Practice

Presented by:
Dominique Lauten, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Royal IV

Purpose: The integration of clinical pharmacy services into the ED is strongly supported in the literature as a method to decrease medication errors and optimize medication therapy, increasing patient safety and promoting beneficial outcomes. Currently there are no dedicated clinical pharmacy services in the ED at Providence Alaska Medical Center (PAMC). The objective of this pilot program was to quantify the role of a dedicated ED pharmacist at PAMC in terms of interventions made, approximate cost savings, and medical staff satisfaction. The data may be used for administrative, practical and clinical purposes to justify the addition of ED clinical pharmacy services.

Methods: A PGY1 pharmacy resident practiced in the ED for one month. Primary activities included prospective patient review, formal and informal pharmacy consults, provision of drug information to staff, attendance at medical and trauma codes, participation in STEMI and stroke cases, and medication reconciliation for complex patients prior to admission. Additional activities were determined by departmental needs, and included facilitation of medication procurement, patient medication counseling, and pharmaceutical care of boarded patients. All activities of the ED pharmacist were documented in a spreadsheet, as well as in the pharmacy documentation system in place at PAMC when possible. Cost savings data were obtained from a pre-established dollar amount assigned to each activity. Data analysis summarized the types of activities in which the
pharmacist participated, the time spent in each activity, and the implied financial impact. Lastly, a survey was
distributed to staff to evaluate the subjective satisfaction with dedicated ED clinical pharmacy services.
Results: There were 432 pharmacist activities recorded over 19 days of ED pharmacist coverage. The most
common were recommendations regarding medication therapy changes (29%, n = 125), provision of drug
information (22%, n = 95), medication procurement (15%, n = 64), medication reconciliation (11%, n = 47) and
attendance at Status 1 and Status 2 codes (6%, n = 25). The majority of the ED pharmacist’s time was spent
making recommendations regarding medication therapy, answering drug information questions, and attending
Status 1 and Status 2 codes. The estimated cost avoidance based on a modified Solucient model in place during
October 2012 was $38,820. There was a high level of satisfaction with ED pharmacy services, with 98% of
pharmacist interventions accepted by physicians.
Conclusions: The ED pharmacist was successfully integrated into the ED workflow and participated in
medication-related activities in the ED. Physicians and nurses actively sought the ED pharmacist as a resource for
drug information and expressed a high degree of satisfaction with ED clinical pharmacy services, with the
majority of ED pharmacist recommendations accepted by the physicians. In addition, ED clinical pharmacy
services are cost effective based on a soft-cost model.

ACPE #:0126-9999-13-305-L05-P
Learning Objectives:
- List four activities by which an ED Pharmacist can integrate into the ED workflow.
- Identify at least two obstacles that may be encountered when piloting a pharmacy program.


296 - IMPACT OF REMOVAL OF PIPERACILLIN/TAZOBACTAM FROM AN ANTIBIOTIC
RESTRICTION PROGRAM IN A VA MEDICAL CENTER
A1. Infectious Disease - Anti-infective Agents

Presented by:
Oska Lawrence, PharmD
Veterans Affairs San Diego Healthcare System
oska.lawrence@va.gov

Presenting on Tuesday, May 14 at 4:00 PM in Mission Bay

Introduction: At the VA San Diego Healthcare System while a formal ASP has not been established, an Antibiotic
Restriction Program (ARP) has served as a mechanism to ensure the safe, responsible, and cost-effective use of
specific antibiotics and antifungal agents. With the advent of the ARP, access was restricted for select agents,
requiring the written or verbal approval from a member of an established Infectious Diseases (ID) consult service
before they could be dispensed by the pharmacy service and subsequently administered to a patient. Prior to
August 2011, piperacillin/tazobactam was among several restricted antibiotics requiring approval by the ID
consult service. Based in part to growing demand for the drug and the resulting increase on the workload of the
consult service, a decision was made to remove piperacillin/tazobactam from the list of restricted antibiotics.
Alternatively, providers now must order the drug by responding to on-screen prompts within the computer
ordering system itself to indicate the expected duration of therapy and selecting one of several listed indications
for use including nosocomial pneumonia, diabetic foot ulcer, intra-abdominal infection, and/or sepsis.
Study Objectives: The study objectives are to (1) determine the impact that removal of piperacillin/tazobactam
from the Antibiotic Restriction Program has had on its pattern of use within the VA San Diego Healthcare System
for four general indications (diabetic foot ulcer, sepsis, nosocomial pneumonia, and/or intra-abdominal infection) and (2) determine if patterns of antimicrobial resistance to piperacillin/tazobactam have significantly changed between 2010 and 2012.

Methodology: The total number of piperacillin/tazobactam administrations per Veterans Affairs Bar Code Medication Administration (BCMA) records will be compared between pre-specified time periods before and after access restrictions were removed (May 2010-2011 and September 2011-September 2012). An analysis will be conducted to determine if rates of use between these two time periods have significantly changed for four general indications (diabetic foot ulcer, sepsis, nosocomial pneumonia, and/or intra-abdominal infection) using corresponding ICD-9 codes. Secondarily, a review of local antibiogram data will be conducted to determine if patterns of antimicrobial resistance to piperacillin/tazobactam have significantly changed between 2010 and 2012.

Results/Conclusion: Will be presented.

ACPE #:0126-9999-13-306-L01-P

Learning Objectives:
1. Explain the impact that antibiotic restriction policies have on provider prescribing patterns.
2. Associate changes in antibiotic prescribing patterns with changes in antimicrobial resistance patterns.


297 - PREVALENCE OF INAPPROPRIATE DRUG-DISEASE INTERACTIONS AT VETERANS AFFAIRS COMMUNITY LIVING CENTER USING BEERS CRITERIA.

B5. Long-Term, Geriatric or Hospice Care

Presented by:

Minh Le, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Sunset IV

Objective: To assess the prevalence of, and factors associated with, potentially inappropriate medication-disease state combinations according to the 2012 Beers Criteria in Veterans residing in VA Community Living Centers.

Introduction: The Beers Criteria was developed in 1991 to identify inappropriate uses of medication where the risks outweigh benefits. Through several updates, most recently in 2012, the guideline introduced changes to the list of medications to avoid and new criteria for drug-disease interactions to avoid in elderly adults in nursing homes or in the community. A study conducted by Aspinall and colleagues included 321 patients from 3 VA CLCs over a 30 day period to assess the rate of ADEs detected by laboratory-medication signals revealed 99 ADEs in 65 patients. Additionally, prior studies implementing varying sets of explicit criteria have shown up to 40% occurrence of drug-disease state interactions in older adults in inpatient and outpatient settings. Assessing rates of drug-disease interactions in nursing home residents is essential to identify risks associated with preventable errors.

Study Design: Retrospective cohort study

Methods:
Veterans who were residing in the Phoenix VA CLC on October 17, 2012 were eligible for the study. Veterans were included if they were age 65 and older with a diagnosis of one or more of the following: heart failure, dementia and/or cognitive impairment, history of falls or hip fractures, history of peptic ulcer disease and/or stage IV or V chronic kidney disease. For the CLC residents meeting the inclusion criteria, co-investigators retrospectively recorded the following data: eGFR if the resident had stage IV or V chronic kidney disease, ejection fraction if the resident had heart failure, sex, race, Hispanic ethnicity, number of days since the most recent admission date to the CLC and type of stay, comorbidities, behavioral symptoms that put the resident/others at significant risk for harm, number of scheduled chronic medications, use of a proton pump inhibitor or misoprostol in patients with peptic ulcer disease, and inappropriate medications associated with the drug-disease interactions of interest based on 2012 Beers Criteria. In addition, investigators evaluated the factors associated with potentially inappropriate combinations.

Results and conclusion will be presented.

Disclaimer:
This study is supported by the Department of Veterans Affairs and is the result of work supported with resources and the use of facilities at the Phoenix VA Health Care System. The investigators are employed through the Phoenix VA Health Care System in Phoenix, AZ. The contents of this study do not represent the views of the Department of Veterans Affairs or the United States Government.

ACPE #:0126-9999-13-307-L01-P

Learning Objectives:
- Describe potentially inappropriate medication-disease state interactions in geriatric patients residing in a long-term care facility.
- Explain factors associated with inappropriate medication usage based on 2012 Beers Criteria in the Veteran population.


298 - A RETROSPECTIVE EVALUATION OF THE UTILIZATION OF INTRAVENOUS ACETAMINOPHEN (OFIRMEV)
A5. Neuro-Psych or Pain Management Agents

Presented by:

Brenden Le, PharmD
Naval Medical Center San Diego
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Presenting on Tuesday, May 14 at 5:00 PM in Palm III

A Retrospective Evaluation of the Utilization of Intravenous Acetaminophen (Ofirmev®)

Acetaminophen, known worldwide as paracetamol, N-(4-hydroxyphenyl)acetamide, was synthesized in 1878 and first clinically used in 1887. It was not until 1953 that it was marketed in the United States as acetaminophen (acetyl-para-aminophenol). Since its introduction, the world has recognized oral acetaminophen as a safe and effective analgesic and antipyretic. The oral and rectal formulations of acetaminophen are available but have been associated with a slow onset of action and variable analgesic activity. Since 2001, Europe has been utilizing the intravenous (IV) formulation of acetaminophen, also known as Perfalgan®. In November 2010, the United States marketed IV acetaminophen (Ofirmev®), which is FDA approved for
management of mild to moderate pain, the management of moderate to severe pain with adjunctive opioid analgesics, and the reduction of fever.
The primary objective of the study is to retrospectively evaluate the appropriate dose, duration, and indication of IV acetaminophen (Ofirmev®) from August 1, 2011 to August 1, 2012. The secondary objectives will be to evaluate the side effect profile of IV acetaminophen (Ofirmev®) and its cost effectiveness. For statistical analysis, the binomial confidence intervals will be analyzed using the rates of the appropriate dose, duration, indication, elevated lab results, side effects, and cost overage occurrence. The total number will be N=600.

Methods
This retrospective review was performed at the Naval Medical Center San Diego from August 1, 2011 to August 1, 2012. An electronic CHCS program will be used to generate patients >18 years old who received IV Acetaminophen (Ofirmev®) at NMCSD. The following parameters will be collected: Age, gender, past medical or surgical history, social history, current medications, allergies, status of oral intake, administration time, indication, dose, frequency, duration, labs, and side effects.

Results/Pending: Pending

ACPE #:0126-9999-13-308-L01-P

Learning Objectives:
- Describe the appropriate dose, duration, and indication of IV acetaminophen (Ofirmev)
- Evaluate the side effect profile of IV acetaminophen (Ofirmev)


### 299 - THE ROLE OF ADJUNCT INTRAVENOUS ACETAMINOPHEN IN REDUCING OPIOID-INDUCED CONSTIPATION AND HOSPITAL LENGTH OF STAY

A5. Neuro-Psych or Pain Management Agents

Presented by:

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**Presenting on Tuesday, May 14 at 4:30 PM in Palm III**

Opioid analgesics have traditionally been the mainstay in treating postoperative pain. Acute pain management with narcotics is limited by tolerance and adverse reactions including constipation, nausea and vomiting, sedation, and respiratory depression. Of particular concern is postoperative ileus (POI), defined as a temporary impairment of gastrointestinal tract motility complicated by opioid use. POI contributes to added hospital costs and increases in hospital length of stay (LOS). One important and practical measure of POI is opioid-induced constipation (OIC). In 2010, the U.S. Food and Drug Administration (FDA) approved a new intravenous (IV) formulation of acetaminophen (Ofirmev®) that, when used in combination with opioids, has been shown to improve analgesia and reduce opioid usage. The aim of this study is to evaluate the clinical significance of this opioid sparing effect in decreasing OIC and shortening LOS. A retrospective chart review will be conducted on patients at least 18 years of age admitted to the Kaiser Permanente Diablo Service Area hospitals between April 1, 2012 to January 30, 2013 for intra-abdominal surgery. The two arms of this study include 1) patients who received at least one dose of adjunct scheduled IV acetaminophen in addition to opioid analgesics and 2) patients who received opioid analgesics without IV acetaminophen in the postoperative setting. The primary endpoint is time to laxation (hours). Secondary endpoints include hospital LOS (days), the cumulative opioid
dose (oral morphine equivalents), and duration of IV acetaminophen and opioid (days). Liver function tests will be collected to evaluate the safety of IV acetaminophen. A cost analysis will be performed to determine the potential financial benefits of adjunct IV acetaminophen. The results of this study will be used to determine if the use of adjunct IV acetaminophen reduces narcotic consumption, and if this reduction leads to decreased OIC and shorter hospital LOS. These findings would provide opportunities to improve patient care and reduce health care cost within our organization.

ACPE #:0126-9999-13-309-L01-P
Learning Objectives:
- Describe the multimodal strategy of pain management and how IV acetaminophen fits into this approach.
- Describe the effects of adjunct IV acetaminophen on OIC and LOS in intra-abdominal surgery patients in the Kaiser Permanente Diablo Service Area hospitals.


300 - EVALUATION OF ACUTE KIDNEY INJURY ASSOCIATED WITH CONCURRENT VANCOMYCIN AND PIPERACILLIN/TAZOBACTAM THERAPY
A1. Infectious Disease - Anti-infective Agents

Presented by:

Mike Le, PharmD
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Presenting on Tuesday, May 14 at 4:30 PM in Mission Bay

Introduction: Within NorthBay Healthcare and other hospital systems, the antibiotic regimen of vancomycin and piperacillin/tazobactam is commonly used for the initial treatment of a significant number of serious infections. In 2011, two studies presented to the Society of Critical Care Medicine suggested that this combination of antibiotics may put patients at increased risk for developing acute kidney injury. The goal of this study is to determine if this association is applicable to the patient population within the small, community hospital system of NorthBay Healthcare.

Studies have reported rates of vancomycin-associated kidney injury to be anywhere from less than 1% to greater than 40%. Unlike with vancomycin, piperacillin/tazobactam has not been strongly linked to acute kidney injury. According to prescribing information, clinical trials of piperacillin/tazobactam reported <1% incidence of renal failure and <2% incidence of increases in serum creatinine values. The two aforementioned studies analyzing the risk of acute kidney injury associated with concomitant vancomycin and piperacillin/tazobactam suggest that this antibiotic combination is more nephrotoxic than expected from either agent alone. Results from both studies showed that patients receiving combination therapy were approximately 4-5 times more likely to develop acute kidney injury when compared to vancomycin control groups.

Acute renal injury is known to impact patient length of stay, healthcare costs, and mortality. If this drug regimen does indeed put patients at increased risk for nephrotoxicity, there may be grounds to support changing current prescribing habits.

Methods: A retrospective chart review was conducted on all adults 18 years of age and older admitted to NorthBay Medical Center and VacaValley Hospital between January 1st, 2012 through December 31st, 2012 who were treated with vancomycin and/or piperacillin/tazobactam for ≥ 48 hours. Exclusion criteria included
patients on hemodialysis prior to receiving the study antibiotics, patients that reported allergies to either study antibiotic prior to receiving them, pregnancy, and patients that received aminoglycosides or amphotericin B during their hospital stay. Incidence of acute renal injury was compared between patients receiving vancomycin for ≥ 48 hours, patients receiving piperacillin/tazobactam for ≥ 48 hours, and for patients receiving a combination of the two agents for ≥ 48 hours. This study received approval from NorthBay Healthcare's Institutional Review Board. Results and conclusions will be presented.

ACPE #:0126-9999-13-310-L01-P

Learning Objectives:
- Describe the potential risk of developing acute kidney injury in patients receiving vancomycin and/or piperacillin/tazobactam
- Describe the impact of dual vancomycin and piperacillin/tazobactam therapy on acute kidney injury within the experiences of a small, community hospital system


301 - AN EVALUATION OF TRANSFUSION RATES WITH ADMINISTRATION OF TRANEXAMIC ACID DURING ELECTIVE ORTHOPEDIC SURGERIES

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Megan Leadbetter, PharmD

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Presenting on Tuesday, May 14 at 4:00 PM in Royal V

BACKGROUND: Orthopedic surgeries are associated with significant blood loss. This often necessitates post-operative blood transfusions which carry risks of transmission of disease and transfusion-related reactions. Measures to minimize effects from blood loss include use of a tourniquet during procedures, employment of blood conservation protocols, and administration of antifibrinolytics such as tranexamic acid. Tranexamic acid is an amino acid analog of lysine that inhibits fibrinolysis in tissue. Although not an FDA-approved indication, studies have shown that tranexamic acid decreases blood loss and post-operative blood transfusion requirements with elective total knee arthroplasties (TKA) and total hip arthroplasties (THA).

OBJECTIVE: The objective of this study was to evaluate whether the utilization of tranexamic acid during elective THA and TKA surgeries at the study site resulted in decreased blood transfusion rates as compared with those who did not receive tranexamic acid.

METHODS: This is a retrospective, single-center, chart review study. Data will be collected for adult patients (age 18-89 years) receiving tranexamic acid for prevention of blood loss during elective THA or TKA between April 1st, 2012 and January 1st, 2013 at the study site. The primary endpoint will be to compare the number of blood transfusions between patients who received tranexamic acid during an elective THA or TKA with a similar cohort who did not receive tranexamic acid. Secondary analyses will include a comparison of length of hospital stay, estimated blood loss during surgery and adverse events between the two groups.

RESULTS: Results and conclusion will be presented.

ACPE #:0126-9999-13-311-L01-P
302 - IMPLEMENTATION OF A POLICY FOR THE MANAGEMENT OF DIABETES IN HOSPITALIZED NPO PATIENTS

A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Brittni Leaf, PharmD
Desert Regional Medical Center
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Presenting on Wednesday, May 15 at 1:30 PM in Mission Bay Foyer

Implementation of a Policy for the Management of Diabetes in Hospitalized NPO Patients
Leaf B, Elg C, Perlick T

Introduction: Oral diabetic medications are the mainstay of treatment for Diabetes Mellitus Type II in the outpatient setting. However, once hospitalized, many patients experience nutrition status changes that make the utilization of these medications challenging. Sulfonylureas, meglitinides, and alpha-glucosidase inhibitors are of greatest concern as these medications are typically dosed around meals and are associated with the highest rates of hypoglycemia. Therefore, in accordance with recent American Diabetes Association (ADA) guidelines, the departments of pharmacy and nursing services at Desert Regional Medical Center developed a policy for treating hospitalized patients on oral hypoglycemics while NPO. The objectives for this study are 1) to determine whether discontinuation of oral diabetic agents will decrease the frequency of hypoglycemic events, 2) to optimize glucose control in the inpatient setting, 3) to ensure current diabetic management is more closely in line with recent ADA guidelines.

Methodology: This study did not require submission to our Bioethics Committee or the Institutional Review Board for approval. Retrospective data was collected utilizing Cerner Millennium between January and March 2011. Data collected included all patients with an NPO status who were receiving oral diabetic agents. This baseline data was used to assess the effect of an NPO status on hypoglycemic events and to compare the impact of policy implementation. Prospective data was collected beginning in January 2013 for patients who were admitted and had a NPO nutritional status along with a medication order for an oral diabetic agent. These patients were followed by a clinical pharmacist and recommendations were made, based on the hospital policy as approved by the Medication Safety and Pharmacy and Therapeutics committees. Pharmacy recommendations included to discontinuing targeted oral diabetic agents and implementing a basal bolus insulin regimen as appropriate.

Results: Preliminary results will be presented at the conference.

ACPE #:0126-9999-13-312-L01-P

Learning Objectives:

Explain the effect oral diabetic agents have on the blood glucose of hospitalized patients who are NPO
Describe a pharmacist’s role in the management of hospitalized diabetics with an NPO nutritional status
Introduction: The treatment of hypertension and hyperlipidemia commonly require chronic pharmacotherapy. However, approximately 50% of patients with chronic illness do not take their medications as prescribed. Poor medication adherence is highly correlated to increased all-cause hospitalization risk and serious cardiac complications in Medicare beneficiaries with hypertension, hypercholesterolemia or heart failure. Medicare beneficiaries with cardiovascular diseases are 100 times more likely to have a preventable hospitalization than someone without a chronic disease. As a result, a goal of Health Net is to improve statin and ACE/ARB adherence in the Medicare population to at least a 4-Star rating in the CMS Quality Measures for Adherence.

Objective: Identify and assess the barriers that decrease adherence to maintenance medication therapy for cardiovascular diseases among Health Net’s Medicare Advantage Prescription Drug (MAPD) population. Furthermore, this study will assess the impact of telephonic outreach by pharmacists and intern pharmacists to improve adherence rates.

Methodology: Health Net identified male MAPD members who responded to the cardiovascular segment of a 2012 Healthy Man Survey, an interactive voice recognition (IVR) campaign, and indicated that they are “rarely adherent” to their prescribed cardiovascular therapy. A telephonic survey of these nonadherent members will be completed to identify barriers to medication adherence. Contacted members will be provided education by pharmacists and intern pharmacists about the health benefits of medication adherence for their chronic conditions, options for improving adherence, and, if necessary, a referral to disease management services. Their primary care provider (PCP) will be sent a fax identifying any issues discovered during the survey. All members that responded to the cardiovascular segment of the 2012 IVR campaign will receive a health information letter about medication adherence and/or cardiovascular diseases, and have a fax detailing their responses to the IVR survey sent to their PCP. The member’s medication possession ratio will be reviewed after six months to determine if adherence has improved from baseline. Members unreachable by phone will become the control population.

Results: There are 337 male MAPD members initially identified for inclusion. Results of the barrier survey and changes in medication possession ratio will be available pending data collection and analysis. Study results will be incorporated into a quality improvement process that attempts to improve adherence to cardiovascular medication through education, support, monitoring, and follow-up communication with members and/or their providers.

Conclusion: Conclusions will be available pending data collection and analysis.

ACPE #:0126-9999-13-313-L01-P
Learning Objectives:
- Describe common barriers to adherence for chronic cardiovascular medications in Medicare patients.
- Describe strategies to improve medication adherence.
304 - EVALUATION OF FACTORS AFFECTING EARLY THERAPEUTIC VANCOMYCIN TROUGHS

A1. Infectious Disease - Anti-infective Agents

Presented by:

Alexia Leal, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Mission Bay

Introduction: Vancomycin is one of the top five most utilized antibiotics at the University of New Mexico Hospitals (UNMH). National infectious disease guidelines suggest higher dosages than the conventional 15 mg/kg every 12 hour dosing, including initiating therapy with a loading dose, to reach a therapeutic vancomycin level faster. At UNMH, a pharmacy-driven vancomycin guideline is used to achieve and maintain vancomycin troughs within the recommended range of 10 to 20 mcg/ml. However, when vancomycin is ordered, a standard dose of 1 gram every 12 hours is often started on most patients with subsequent dose adjustments based on vancomycin troughs. Culture identification and susceptibilities are finalized around the time that the first vancomycin level is due. If methicillin resistant Staphylococcus aureus (MRSA) is not isolated from cultures, then providers are encouraged to discontinue vancomycin therapy. The objective of this study is to determine how effective our standard vancomycin dosing regimen is at achieving an early therapeutic vancomycin trough level. If a large percentage of patients are achieving levels within the therapeutic range, we may avoid drawing unnecessary vancomycin levels in patients for whom vancomycin is unlikely to be continued.

Methodology: This was a single-center, retrospective study conducted at UNMH, a 646-bed tertiary care teaching hospital. Patients were identified from UNMH’s reference laboratory database of all vancomycin levels drawn on adult patients between June 1, 2011 and December 31, 2011. Only the first vancomycin level for each patient was evaluated. Patients were included if they were 18 years of age or older, received intermittent intravenous vancomycin, and received an appropriately drawn vancomycin level, defined as a level drawn prior to the 4th or 5th consecutive vancomycin dose. Patients were excluded from this study if they were administered vancomycin as a continuous infusion, received vancomycin within 48 hours prior to admission, received hemodialysis at the time of administration, were admitted to an intensive care unit, were pregnant, or were incarcerated during their hospital admission. Data collection included patient age, gender, and ethnicity. Baseline characteristics including weight, height, and serum creatinine were collected, along with the vancomycin dose, frequency, administration times, suspected indication, concurrent nephrotoxic agents, and whether or not therapy was discontinued within five days. Data was entered into a SPSS database, and patient demographics were compared using descriptive statistics (t-test and chi-square for continuous and categorical variables, respectively). Therapeutic vancomycin troughs and non-therapeutic troughs were analyzed via chi-square, and multivariable logistic regression was used to determine predictors for therapeutic levels.

Results/Conclusion: Data collection currently in progress.

ACPE #:0126-9999-13-314-L01-P
Learning Objectives:

List factors that may contribute to a patient’s ability to achieve a therapeutic vancomycin level while receiving intermittent IV vancomycin therapy.
Explain if therapeutic drug monitoring of vancomycin is necessary in non-critically ill patients exposed to less than or equal to five days of systemic vancomycin therapy.


305 - INVESTIGATING HYPOKALEMIA MANAGEMENT IN ACUTE HEART FAILURE PATIENTS
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Helen Lee, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Royal V

Background/Purpose:
Hypokalemia is associated with an increased risk of arrhythmia and mortality in patients with heart failure (HF). Importantly, the pathophysiology of HF renders these patients susceptible to the development of hypokalemia. Neurohormonal activation contributes to serum potassium depletion. In addition, HF patients routinely receive diuretics which increase renal potassium excretion. Despite being a marker for poor patient outcomes, there is a paucity of data on the incidence of hypokalemia in acute HF. Patients may also exhibit a poorer response to potassium supplementation secondary to reduced absorption of oral potassium and continued excretion of potassium during diuresis. Therefore, HF patients may require larger doses of intravenous or oral potassium to achieve normokalemia compared to other cardiac intensive care unit patients. It is also unknown whether orally administered supplemental potassium is an effective means of replacement in acute HF patients. Therefore, our hypothesis was that potassium supplementation needs to be more aggressive in acute HF patients compared to other cardiac intensive care unit patients. The hypothesis was tested through 2 specific aims: 1) to delineate the incidence and severity of hypokalemia in HF patients admitted to the cardiac intensive care unit and 2) to describe the efficacy of current oral and intravenous potassium replacement practices for maintaining normokalemia and to determine the magnitude of serum potassium change from potassium replacement in HF patients compared to non-HF patients matched for demographic characteristics.

Methodology:
A retrospective chart review was conducted. A total of 441 acute HF patients admitted to the cardiac intensive care unit (CICU) of LAC + USC Medical Center between January 1, 2010 to December 31, 2010 were included. The overall incidence of hypokalemia stratified by severity (<3.0, <3.5, and 3.5-3.9 mEq/L) and percent of days in-hospital was determined. In a secondary analysis, a cohort (N=37) of acute HF patients (admitted for ≥ 3 days and who received potassium supplementation) was compared with a non-HF cohort (N=37) matched for age, gender, body weight, renal function, and length of stay. The primary endpoint was the mean daily change in serum potassium concentrations standardized to 20 mEq of potassium replacement. The secondary endpoint was mean daily change in serum potassium standardized to 20 mEq of potassium in oral versus intravenous potassium supplementation in HF.

Results:
Overall, the incidence of suboptimal potassium (<4.0 mEq/L) was 88.4%, with 88% having a serum potassium between 3.5-3.9 mEq/L, 42.2% experiencing mild hypokalemia (3.0-3.4 mEq/L), and 8.2% severe hypokalemia (<3.0 mEq/L). For all patients, serum potassium was suboptimal 47% of the days in the CICU, and hypokalemia
was documented during 10.6% of the days. The mean initial, minimum, and discharge serum potassium concentrations were 4.34±SD mEq/L, 3.54±SD mEq/L and 4.22±SD mEq/L, respectively. Further results will be presented at time of data collection

Conclusion:
To be presented at time of data collection

ACPE #:0126-9999-13-315-L01-P

Learning Objectives:

- Explain the incidence and severity of hypokalemia in heart failure patients admitted to the cardiac intensive care unit.
- Describe the efficacy of potassium replacement modalities in heart failure patients.


306 - UTILIZATION OF TOBACCO CESSATION AIDS IN A MEDICAID MANAGED CARE POPULATION BEFORE AND AFTER PRIOR AUTHORIZATION REMOVAL

E1. Managed Care

Presented by:

Matthew Lee, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Sunset II

Tobacco use continues to be the most preventable cause of death in the United States. Most state Medicaid programs cover at least one tobacco cessation treatment to combat the tobacco epidemic among Medicaid members. Many Medicaid plans require prior authorization with documentation of proof of enrollment in a tobacco cessation program because combining smoking cessation aids with counseling significantly improves abstinence rates (AHRQ Publication No. 00-0032; May 2008). Utilization remains low due to lack of awareness, inaccurate information about accessing benefits, and low perceived effectiveness (Am J Prev Med 2012;42(6):588-595). In August 2012, a Medicaid managed care plan in Orange County, California removed the prior authorization (PA) restriction which required proof of enrollment in a tobacco cessation program. The health plan’s Pharmacy and Therapeutics Committee requested an evaluation to determine if access to tobacco cessation products would improve after the formulary change.

The primary study objectives were to analyze the utilization patterns and associated costs of tobacco cessation products by adult Medicaid managed care members before and after removal of the PA requirement. Secondary objectives included determining whether members received tobacco cessation counseling services and characterizing the types of counseling services members obtained, assessing quit rates among members, and providing tobacco cessation counseling resources to members.

The study data were collected from pharmacy claims from April 1, 2012 through December 31, 2012. The following inclusion criteria were used to identify the study population: Medicaid managed care members age 18 to 64 years of age with at least one paid pharmacy claim for a tobacco cessation therapy within the study period. Members were excluded if they were not continuously eligible during the study period and did not meet the age requirements. Members with paid pharmacy claims for one or more tobacco cessation therapy before August 1, 2012 were classified as pre-PA group and those with at least one paid pharmacy claim after August 1, 2012 were classified as post-PA group. In both groups, a one-time telephone outreach by a pharmacist was made to
determine whether members received counseling, what type of counseling was received, and the quit rates among members. Drug utilization and costs incurred by the health plan were calculated and analyzed from pharmacy claims. Counseling rates, types of tobacco cessation counseling services received, quit rates, drug utilization, and plan costs were compared between the pre-PA group and post-PA group. There were 155 members who met inclusion criteria as pre-PA group members and 197 members who met inclusion criteria as post-PA group members. There were a total of 272 pharmacy claims (plan cost: $24,537.25) and 359 pharmacy claims (plan cost: $32,261.78) in the pre-PA group and post-PA group, respectively. The most utilized tobacco cessation therapy was nicotine replacement therapy, followed by varenicline and bupropion. Members were predominately female between the ages of 40 to 59 years. In both groups, the most common smoking-attributable co-morbidity was COPD, followed by asthma, ischemic heart disease/coronary artery disease, cardiovascular disease, and lung cancer. The telephone outreach results and conclusions will be presented and discussed.

ACPE #:0126-9999-13-316-L01-P
Learning Objectives:
- Describe the most common tobacco cessation pharmacotherapies utilized within the Orange County Medicaid population during the study period of April 1, 2012 through December 31, 2012.
- Describe the most common tobacco cessation counseling types utilized within the Orange County Medicaid population during the study period of April 1, 2012 through December 31, 2012.


307 - LOWERING BLOOD TRANSFUSION FREQUENCY BY PHARMACIST MANAGED ANEMIA CLINIC
B1. Ambulatory Care

Presented by:
Jae Lee, PharmD
Providence St. Peter Hospital
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Presenting on Wednesday, May 15 at 2:30 PM in Sunset V

Introduction: Blood transfusion is generally considered as a last resort treatment for anemia. However, it has been noted at Providence St. Peter Hospital that untreated pre-existing anemia has possibly been contributing to blood transfusions after surgery. Therefore, Providence Southwest Washington Region has incorporated anemia management into pharmacy services provided by the Anticoagulation and Anemia Clinic. This study will assess pharmacists’ impact on blood transfusion frequency after pharmacists have effectively managed patients’ existing anemia prior to their surgery.

Methods: The study will consist of two sample populations. The first population consists of patients who have undergone either total knee replacement or total hip replacement during the chosen period by selected orthopedic surgeons at the Providence St. Peter Hospital. The researchers will obtain the total number of orthopedic patients, the number of patients who have received blood transfusions, and the cumulative unit amounts of blood transfusion that the total orthopedic patients have received during the elected time period. This population does not have any pharmacists’ interventions. The second sample population will only include patients who were seen by the same chosen orthopedic surgeons and referred to the Anticoagulation and
Anemia Clinic greater than 30 days prior to their orthopedic surgery to allow sufficient time to treat anemia before the surgery. The researchers will obtain the same metrics for this population group as the first group. Results/Conclusion: IRB approval has been obtained and data collection is being conducted. Study results and conclusions will be presented.

ACPE #:0126-9999-13-317-L01-P
Learning Objectives:
1. Describe how pharmacist anemia management services impacted blood transfusion frequency
2. Discuss the benefits of pharmacist anemia management services in ambulatory care settings


308 - DEVELOPMENT, IMPLEMENTATION AND IMPACT OF A PHARMACIST – MANAGED REFILL CLINIC WITHIN A MANAGED CARE ORGANIZATION
B1. Ambulatory Care

Presented by:
Crystal Lee, PharmD
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Presenting on Wednesday, May 15 at 1:30 PM in Sunset V

Introduction – Primary care providers (PCPs) have limited office visit time regardless of the complexity of the patient’s problems and in addition to other responsibilities including prescription refill requests submitted by pharmacies and / or the patients. Sharp Rees-Stealy (SRS) Medical Group implemented a pharmacist-managed prescription refill clinic on February 1, 2012. The objective of this study is to assess the impact of refill clinic pharmacists (RFP) on patient compliance. Benefits of these services include but are not limited to reducing provider’s refill prescription burden, increasing appointment frequency, and providing additional safety monitoring.

Methodology - The study was designed as a retrospective observational study. A database was constructed from patients who had their prescription refill authorized by the RFP between March 1 and September 31, 2012. Once these patients were identified, an electronic medical record review was conducted. The baseline compliance rate was based on adherence to the follow-up appointment and laboratory monitoring specified by the provider six months prior to pharmacist managed refill clinic. Patient data collected included sex, age, provider, medication, and the pharmacists’ documented intervention that could involve a follow-up appointment and/or laboratory monitoring request and whether these interventions were complied with by the patient and/or PCP. Additional procedural and clinical outcome data collected included average time offset from PCP’s workload through survey, average refill request idle time in MySharp system before and after implementation of the refill clinic, diabetic and hypertensive patients’ HbA1c and blood pressure six months prior to and after the implementation of the refill clinic. These data were collected to guide other managed care organizations in their efforts to establish a pharmacist run refill clinic. All data were collected without patient identifiers and patient confidentiality was maintained throughout the study.

Results - Results pending at time of abstract submission
Conclusion - Conclusion pending at time of abstract submission

ACPE #:0126-9999-13-318-L04-P
Learning Objectives:
- Describe the outcomes of the pharmacist’s interventions in patient’s adherence to follow-up appointment and laboratory monitoring.
- Describe the impact pharmacists have on the establishment of refill clinics.


**309 - INCIDENCE OF ACUTE KIDNEY FAILURE IN PATIENTS RECEIVING VANCOMYCIN AND/OR PIPERACILLIN-TAZOBACTAM**

A1. Infectious Disease - Anti-infective Agents

Presented by:

GRACE LEE, PharmD
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*Presenting on Wednesday, May 15 at 8:00 AM in Dockside*

Vancomycin and piperacillin-tazobactam are commonly used antibiotics in the acute care hospital either as a single agent or as a combination regimen to treat a variety of infections. Vancomycin is a tricyclic glycopeptide bactericidal antibiotic that alters permeability of bacterial cell membrane and interferes with RNA synthesis, thus inhibiting cell wall synthesis. It has activity against aerobic and anaerobic gram-positive organisms, especially methicillin-resistant Staphylococcus aureus. Piperacillin-tazobactam is composed of semi-synthetic beta-lactam antibiotic, piperacillin, and a beta-lactamase inhibitor, tazobactam. This combination drug has bactericidal activity against a variety of gram-positive and gram-negative aerobic and anaerobic organisms. Lately, there has been a rise in reported incidence of acute kidney failure among patients receiving vancomycin and/or piperacillin-tazobactam, either as monotherapy or as combination therapy. Both agents are known to be nephrotoxic especially when high doses are administered or when given to patients with risk factors for developing nephrotoxicity (i.e. age, longer duration of therapy, concomitant nephrotoxins, pre-existing kidney dysfunction, etc.)

This is a retrospective chart review of patients receiving vancomycin therapy with or without concomitant piperacillin-tazobactam to assess the incidence of acute kidney failure while on these antibiotics at Fountain Valley Regional Hospital and Medical Center. The incidence of acute kidney injury was defined as an increase in serum creatinine of 0.5mg/dL or ≥50% from baseline. Furthermore, this study will determine the risk factors that may contribute to developing acute kidney failure in patients on vancomycin and/or piperacillin-tazobactam.

Data analysis, results, and conclusions will be presented.

ACPE #:0126-9999-13-319-L01-P

Learning Objectives:
- Describe the incidence of acute kidney failure in patients receiving vancomycin and/or piperacillin-tazobactam either as a single agent or as combination therapy.
- Describe any risk factors for patients with acute kidney failure on vancomycin with or without concomitant piperacillin-tazobactam.

Clinical pharmacy services have proven to be effective in improving the control of many chronic conditions including diabetes. Upon reaching treatment goals, most clinical pharmacy services discharge patients and return them to primary care providers for continued care. While many studies have demonstrated the positive impact of pharmacists’ interventions on achieving glycemic goals for diabetes patients, no studies have been published evaluating the durability or persistence of glycemic control for patients who are no longer under pharmacists’ care. The primary objectives of this study are to evaluate the durability of diabetes control one year following discharge from a clinical pharmacy service and to identify variables associated with long-term control.

This is a single-centered, retrospective cohort study conducted at a large urban county comprehensive health center that provides care for a largely Latino population. Clinical pharmacy services have been integrated into the center for over four decades. Medical records of patients discharged from the clinical pharmacy service for diabetes care between January 1, 2010 through December 31, 2011 were reviewed. Every patient referred to the clinical pharmacy service received education on disease state and associated complications, evaluation of drug therapy-related problems, and self-management advice including medication adherence, lifestyle modifications, and use of medication-related devices. Changes in medication therapy were made by the pharmacist as needed to achieve therapeutic goals. Discharged patients who met treatment goals for at least two subsequent visits were included in the study. The primary outcome measure was change in hemoglobin A1c from the time of discharge and up to one year. Descriptive and multivariate statistical methods will be used to evaluate the data.

Preliminary Results:
Four hundred and forty patients were enrolled in the clinical pharmacy service during the defined study period. Of those, 36 patients were discharged from the clinical pharmacy service for diabetes care after reaching therapeutic goals. The mean age of the cohort was 61 years with 72% female and 97% Hispanics. The mean hemoglobin A1c at initial clinical pharmacy visit was 8.4% and 6.8% at the time of discharge. Further results to be presented at the conference.

Learning Objectives:
Describe the durability of glycemic control one year following discharge from a clinical pharmacy service.
List variables associated with durable glycemic control.

311 - CELECOXIB VERSUS BEST SUPPORTIVE CARE FOR CAPECITABINE-INDUCED HAND-FOOT SYNDROME FOR GASTROINTESTINAL ONCOLOGY PATIENTS

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Catherine Lee, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Sunset I

Introduction:
Capecitabine is an oral fluoropyrimidine that is enzymatically converted to 5-fluorouracil within cancer cells. One of the most common adverse events of capecitabine is hand-foot syndrome (HFS) and may be a dose-limiting toxicity for patients. The incidence of HFS associated with capecitabine ranges from 50-60% and the incidence of severe HFS (≥ grade 3) ranges from 10-17%. Hand-foot syndrome (HFS) varies in terms of onset of toxicity development, degree of severity and duration of symptoms. Symptoms are subjective per the patient with pain as a distinguishable toxicity that indicates the severity of HFS. Patients are counseled in the gastrointestinal oncology clinic to utilize various supportive care therapies to prevent the emergence of HFS. Common supportive care therapies include: pyridoxine (vitamin B6), sunscreen, or lanolin-based creams. HFS may have an inflammatory component mediated by cyclooxygenase-2 (COX-2) activation, in which celecoxib, a COX-2 inhibitor, may be of benefit in preventing symptom onset.

Methods:
A retrospective chart review was performed at a tertiary, academic gastrointestinal oncology clinic. The study was conducted as a retrospective observational cohort to track emergence of hand-foot toxicities for patients starting oral capecitabine at the Seattle Cancer Care Alliance (SCCA). The objective of this study is to evaluate the incidence of HFS toxicities by incorporating a standardized symptom assessment tool that may aid in comparing the effectiveness of supportive therapies versus concomitant celecoxib for patients on oral capecitabine. Patients will be identified by the health system’s electronic medical record and will include those who have initiated capecitabine treatment for a gastrointestinal tumor. HFS documentation is provided by nursing or medical provider notes in the electronic medical record. A symptom assessment tool will be used to evaluate grading of HFS in prior progress notes and determine the variation in assessment of symptoms. The following data will be collected: patient age, gender, ethnicity, weight, medical conditions, type and stage of cancer, medication profile, renal function, chemotherapy or chemoradiation regimen, capecitabine doses, type of preventative care and compliance to oral capecitabine. The primary study endpoint is time to onset of any hand-foot syndrome symptom of any grade. Secondary endpoints include: capecitabine dose reduction, duration of dose reduction, incidence of discontinuation of capecitabine, and time to resolution of HFS.

Results and Conclusion:
Data collection and analysis is currently being conducted

ACPE #:0126-9999-13-321-L01-P
Learning Objectives:

- Describe characteristics of hand-foot syndrome and its mechanism of action.
- List supportive care therapies or medications to prevent the onset or severity of hand-foot syndrome.

312 - IMPLEMENTATION OF AN AMBULATORY CHEMOTHERAPY INFUSION SYSTEM
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Esther Lee, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Sunset I

In the past ten years, the administration of chemotherapy has shifted from the inpatient to the ambulatory setting. Many chemotherapeutic regimens, previously administered in the hospital are now given in infusion centers, allowing for more efficient use of resources and resulting in improved quality of life for patients. Most regimens are administered over several hours, following which the patient goes home. A particular challenge occurs with multi-day regimens where the medication is administered by continuous infusion. Current practice at this institution is to admit the patient to the hospital for the entire duration of therapy. This can result in undesirable effects such as infections, and increases the overall resource utilization and cost to the healthcare system. The development of new infusion devices, in this case elastomeric pumps which deliver the medication at a specific rate, has created opportunities for avoidance of hospitalization and improvement in patient’s quality of life by allowing infusion in the home setting. The goal of this project is to develop and implement a home infusion program for chemotherapy using the Baxter elastomeric infusion system. Patients receiving multi-day chemotherapy regimens by continuous infusion will be identified. The chemotherapy solution will be loaded into an elastomeric pump, and a nurse in the Infusion Clinic will connect the pump to the venous catheter port. At the end of the infusion period, the pump will be removed and discarded. The following data elements will be collected: patient demographics, chemotherapy regimen, adverse effects (if any), as well as the patient’s assessment of the experience. The effectiveness of the program, including the financial impact, as well as the role of the pharmacist, will be discussed in the presentation.

ACPE #:0126-9999-13-322-L01-P
Learning Objectives:
- List chemotherapy regimens that are amendable to continuous infusion in the home setting
- Explain the process of initiating home-based chemotherapy, and the financial impact of preventing hospital admissions


313 - MORISKY MEDICATION ADHERENCE SURVEY TO PREDICT MEDICATION ADHERENCE IN TYPE II HISPANIC DIABETES PATIENTS IN LA COUNTY SAFETY NET CLINICS
B2. Community Practice

Presented by:

Samuel Lee, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Sunset V

Introduction
Poor adherence is a significant and well-documented issue in the management of diabetes. Other than waiting for a diabetic to become non-adherent to the treatment plan, there is little evidence to support a tool for predicting those that may become non-adherent. To address this need, the Morisky Medication Adherence Survey (MMAS-8), originally targeted to assess hypertension medication adherence, was modified in the literature for Hispanic patients on type II diabetes medications.

The MMAS is a self-reported 8-item measure of medication-taking addressing circumstances surrounding adherence behavior. Scores can range from 0 to 8 and are trichotomized into the following 3 levels of adherence to facilitate use in clinical practice: high adherence (score, 8), medium adherence (score, 6 to <8), and low adherence (score, <6).

Since the Mexican American ethnicity has been shown to be a predictor for poorer glycemic control, having measures to quickly assess adherence longitudinally in this population would be invaluable in clinical practice. If the clinician is able to properly assess adherence to medications, this would provide a clear picture of where changes can be made to improve glucose control. The MMAS, if proven reliable in this population, will have an immediate impact in assessing a diabetic’s ability to remain compliant to a medication regimen due to its ease of administration and immediate feedback at point of care.

The primary objective of this study is to test the predictive validity of a self-reported adherence measure, the MMAS-8, in low-income, minority patients with type II diabetes by correlating with pharmacy fill data.

Methodology
We will conduct a prospective nested survey design using the MMAS-8 within a larger federally funded project from December 2012 till March 2013. The Diabetes-Depression Care-management Adoption Trial (DCAT) is a study that is developing and testing care management technology to facilitate depression care. The DCAT experimental design targets low-income, racially and ethnically diverse diabetes patients in nine safety net clinics run by the Los Angeles County Department of Health Services.

The DCAT study aims to recruit over 1,500 adult diabetes patients and will include three comparison arms—usual care (UC), supported care (SC) and technology-facilitated care (TC). Patients in the UC arm will receive no intervention except for baseline depression screening, physician notification of screen results, and patient depression education materials. All patients in our survey based study will be from the UC arm to avoid potential bias. Patients who meet inclusion criteria for the DCAT study are consented and also administered the MMAS-8 questionnaire. Patient medication profile data will be used to calculate the Medication Possession Ratio (MPR) and Proportion of Days Covered (PDC) with 80% or greater considered adherent over a 6 month period. Patient medical record data will be used to obtain glycosylated hemoglobin (HbA1c) values to further substantiate adherence. Data from the MMAS-8 within the DCAT study will be examined for correlations with the MPR, PDC, and HbA1c. Descriptive and inferential data will be presented.

Results and conclusions to be presented

ACPE #:0126-9999-13-323-L01-P

Learning Objectives:
- Describe how self-reported adherence surveys can help improve patient assessment in the outpatient ambulatory care setting.
- List 4 adherence behaviors that might identify a patient with poor medication-taking habits.

Background/Purpose: The Center for Disease Control states that approximately 36% of adults over the age of 20 are obese (BMI > 30kg/m2) and numbers are rising. Obesity can have profound implications on pharmacokinetics and pharmacodynamics of medications. Some complications that may arise are: altered liver function, protein binding, tissue distribution, increased clearance, changes in cardiac output, and changes in body composition. One class of medications which may be affected is the non-depolarizing neuromuscular blocking agents (NMBA). Based on limited existing data, it is difficult to determine if total body weight (TBW), ideal body weight (IBW) or adjusted body weight (ABW) provides optimal dosing for NMBAs in the obese patient population.

The primary goal of this study is to determine if there is a difference in the time to a therapeutic train-of-four (TOF) in obese patients vs. non-obese patients receiving a continuous infusion (CI) of a non-depolarizing NMBA. The secondary goal of the study will be to determine the optimal dosing weight for the obese population if a difference is found between the two groups.

Methods: A retrospective study evaluating the time to a therapeutic TOF in patients with a BMI < 30kg/m2 vs. patients with a BMI ≥ 30kg/m2 receiving a continuous infusion of a NMBA were analyzed. A therapeutic TOF is defined as 1 to 2 twitches or as specified through a physician order. Time to a therapeutic TOF is characterized by time to two consecutive therapeutic TOFs minimally of 1 hour apart. Data will be collected from May 1, 2005 to December 31, 2011. Patients will be included that are > 18 years of age who received a CI of only rocuronium, vecuronium, cisatracurium, or atracurium for > 6 hours. Exclusion criteria consist of no documentation of two consecutive TOFs, incomplete patient documentation, or a diagnosis of: myasthenia gravis, Lambert-Eaton syndrome, Guillain-Barré syndrome, spinal cord injury, or muscular dystrophy. Baseline characteristics, drug interactions and renal and hepatic function will be evaluated and reported.

Results and Conclusions
To be presented

ACPE #:0126-9999-13-324-L01-P
Learning Objectives:
1. Describe implications of differences in body composition on pharmacokinetics and pharmacodynamics when comparing obese and normal weight patients.
2. Identify the optimal dosing weight for non-depolarizing NMBA in the obese population receiving a continuous infusion of rocuronium, vecuronium, cisatracurium, or atracurium.

Introduction:
The underutilization of generic medications is estimated to incur $6 billion in unnecessary drug costs to patients and insurers annually. One emerging strategy to encourage generic utilization is to target physician electronic prescribing (e-prescribing) through the use of computerized, automatic alerts indicating the availability of generic alternatives. Computerized notifications within an Electronic Health Record (EHR) system have demonstrated modest initial improvements in generic medication dispensing rates (GDR), but the effectiveness dramatically wanes over time.

The advent of EHR interoperability, defined as the seamless exchange of electronic data between health professionals within a single interface, may offer a unique opportunity for virtual pharmacists to improve physician GDR. The novel employment of a virtual pharmacist – an authorized pharmacist who proposes or initiates clinical interventions electronically within a physician’s EHR – has yet to be studied. Virtual pharmacists may offer benefits by streamlining clinical data from multiple sources, offering various generic options, and aligning recommendations with a physician’s workflow to facilitate generic substitution counseling during patient appointments. This study will attempt to determine the impact of using virtual pharmacists in recommending generic medication substitutions within an interoperable EHR system on physician GDR in an independent physician association (IPA).

Methodology:
This longitudinal, retrospective analysis was conducted at an IPA in Northern California. During the study period, April 1, 2011 to December 31, 2012, 27 participating physicians were electronically notified within the EHR system of generic substitution opportunities by a virtual pharmacist. Operating through the EHR, the virtual pharmacist accessed a physician’s appointment list to identify patients using branded medications with generic alternatives, and then messaged the physician with the patient-specific generic recommendations. The primary outcomes to be evaluated are generic conversion rates for all messages, change in overall provider GDR by sentinel effect, and change in overall provider GDR by accumulated message effect. The sentinel GDR effect (GDR change from baseline at six months after initial message) evaluates whether physicians may be extrapolating generic substitution recommendations to beyond the patients targeted by the virtual pharmacist. The accumulated GDR effect (GDR change from baseline at one month after the last measured message) evaluates whether multiple distinct messages may have a compounding effect on physician GDR. Secondary outcomes will include an analysis of factors that may influence generic conversion rates, such as drug class type, number of distinct messages sent per provider, patient age, and physician age.

Results and Conclusion:
Final results and conclusion will be presented.
Describe the effectiveness of generic substitution recommendations by a virtual pharmacist utilizing an electronic health record (EHR) platform on generic medication utilization
List possible factors that may impact generic medication dispensing rates (GDR)


316 - IMPACT OF ANTIMICROBIAL STEWARDSHIP PROGRAMS ACROSS A HEALTH SYSTEM
A1. Infectious Disease - Anti-infective Agents

Presented by:

Pamela Levine, PharmD
Providence Health and Services at Providence Portland and Providence St. Vincent Medical Centers
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Presenting on Wednesday, May 15 at 8:30 AM in Dockside

Introduction
Inappropriate antimicrobial use negatively impacts patient care through increased development of bacterial resistance, antibiotic-associated adverse events, and increased costs to patients and health systems. With up to 50 percent of antibiotic use inappropriate, antimicrobial stewardship programs (ASPs) have proven benefits to health systems, reducing antibiotic use by 22-36 percent, decreasing costs and hospital length of stay. ASPs are interdisciplinary in nature; pharmacists are a key part of this team. This project is an evaluation of ASPs across a health system, and compares institutions to correlate ASPs with associated impact.

Methodology
Providence Health and Services is a multi-state health system with 24 institutions that report antimicrobial usage via a centralized system. The hospitals vary in size and patient populations, with ASPs ranging from highly structured to informal. This is a retrospective data analysis of antimicrobial use and spending. Antimicrobial utilization data are reported in days of antimicrobial drug therapy per 1000 patient days (DOT) and further stratified by clinical service line. Length of therapy per 1000 patient days (LOT) and observed/expected use ratio data are also available. System-wide, these data are described in terms of trends in antibiotic usage, focusing on high cost, high risk medications. The hospitals were surveyed to determine the type of ASP in place at the institution and what types of interventions are included in the ASP. Two urban hospitals will be subject to a more detailed analysis, including quantification of pharmacist interventions made during 2012. Cost avoidance and antimicrobial cost expenditures will be further described. Results will be benchmarked to published national antimicrobial use standards.

Results and Conclusion will be presented at Western States Residency Conference.

ACPE #:0126-9999-13-326-L01-P
Learning Objectives:
- Describe 3 benefits of antimicrobial stewardship programs
- Explain the utility of DOT and LOT metrics

Meaningful use of evidence and utilization of data to support rational use of medications are at the forefront of the evolution of healthcare. Rich sources of data that are derived from clinical information systems can be used to examine usage of medications based on a variety of parameters such as indications for use, disease, duration of use, patient age, and prescriber specialty. Albumin and epoetin alfa were selected for evaluation because there are opportunities to reduce overuse without compromising quality of care.

Based on one year of MS-DRG data obtained from the University of HealthSystem Consortium (UHC) Clinical Resource Manager, top indications for use of albumin and epoetin alfa were identified at Cedars-Sinai Medical Center (CSMC) and compared to other institutions. Both of these medications are routinely used in dialysis-dependent renal disease patients, which prompted an analysis of their proper use. There has been no proven clinical advantage in using albumin over normal saline in the setting of intradialytic hypotension, with albumin being associated with substantially more cost. In addition, certain populations receiving albumin have developed serious adverse events such as transmission of infection, hyperoncotic syndrome leading to kidney injury, and increased mortality. Epoetin alpha use in dialysis patients presented another opportunity to ensure rational use. There is uncertain benefit as to whether epoetin alfa maintains its functionality in patients who are acutely ill, as trials have only shown a decrease in the need for red blood cell transfusions and not an improvement in clinical outcomes. This presents an ideal opportunity to define appropriate parameters for use of these agents through an evidence-based approach.

Methods:
Medication use evaluations were conducted to describe patterns of albumin and epoetin alfa use. A literature review was compiled to locate evidence supporting the role of these medications based on clinical outcomes, adverse events, and mortality risk. The primary goal of this study was to institute a physician-pharmacist collaborative group in order to establish guidelines for prescribing these medications. Proposed recommendations include the addition of a step-wise approach to fluid support for intradialytic hypotension and the restricted use of epoetin alfa based on duration of hospital stay, dose, and lab value parameters.

Results and Conclusions: To be presented.

Learning Objectives:
- Explain the importance of using clinical information systems to identify key areas for improvement in the health care system.
- Describe how a multi-practitioner collaboration can impact prescribing patterns at a large, tertiary teaching hospital.

Introduction:
Few children’s hospitals have implemented comprehensive Antimicrobial Stewardship Programs (ASPs). Successful implementation of ASP strategies significantly reduced targeted-and non-targeted antimicrobial use, improved quality of care of hospitalized children and prevented emergence of resistance1. When examining trends in pediatric antimicrobial use in 20 academic health centers during 2002-2007, linezolid use has dramatically increased. The mean number of days of therapy (per 1000 patient days) were approximately 0.87 in 2002 vs. 3.3 in 2007 with a p-value <0.0012. In addition to the rising use of linezolid, ensuing costs and rising resistance rates, linezolid-associated hematologic toxicity and other toxicities are of equal concern3. This study at Lucile Packard Children’s Hospital (LPCH) at Stanford will characterize linezolid use and serve as a quality assurance investigation of our evolving ASP.

Study Objective:
The primary objective of this study is to characterize the utilization of linezolid at a pediatric academic center with particular attention to the prescribing patterns for linezolid, the appropriateness of therapy and the costs associated with inappropriate use. We will also assess the impact of a newly implemented linezolid clinical decision support feature in our computer-physician order entry (CPOE) system as a component of our hospital’s ASP.

Methods:
This is a retrospective and prospective, single-center, case series study among inpatients prescribed to receive intravenous or oral linezolid therapy from June 2011 and continuing through June 2013. Descriptive statistics will be used to evaluate demographics, diagnostics, pharmacotherapy, adverse effects, and costs. The use of linezolid in the hospital with respect to indication and appropriateness of therapy will be characterized and the utilization of the Infectious Diseases Consult Service will be assessed. The trend of linezolid use before and after implementation of the clinical decision support feature in CPOE will be evaluated. The results of this study will help determine the effectiveness of our ASP strategy and guide future interventions. Results and discussion will be presented.

References:

ACPE #: 0126-9999-13-328-L01-P

Learning Objectives:
- List appropriate indications for linezolid as empiric therapy in a pediatric patient.
- Describe the role a pharmacist can have in the development of a new ASP in a pediatric academic medical center.

319 - EFFECTS OF PHARMACEUTICAL REPRESENTATIVES ON PRESCRIBING PRACTICES
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Tak Li, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Sunset III

Introduction: The presence and influence of pharmaceutical representatives (PR) in a medical treatment facility (MTF) on the prescribing patterns of providers remain a controversial and under-studied issue. A significant portion of the literature is driven by subjective surveys. The purpose of this study is to determine if frequent PR presence and interaction with providers contribute to differences in prescribing patterns.

Methodology: This study retrospectively assesses the prescribing patterns of frequently represented versus non-represented pharmaceuticals between Family Healthy Clinic and Family Medicine Clinic from August 2011 to July 2012. Frequently represented pharmaceuticals are defined as pharmaceuticals whose PR visited the institution at or above the median visit number. The prescribing patterns of another clinic (Family Medicine) will also be utilized as an extra control cohort for clinics with no PR visitations. PR visits will be tracked by Reptrax, our PR monitoring system from which visitation data will be extracted. Prescription and patent data will be extracted from our electronic medical database. A voluntary electronic survey to PR will identify the pharmaceutical agents being represented and confirm at least 1 visit to the FHC. Overall extracted data will include: PR names, pharmaceutical company names, pharmaceuticals represented, number of visits, PR with at least 1 FHC visit, and prescription volume. Descriptive statistics, student t-test and the fisher’s exact test will be utilized as appropriate for data reporting and analysis.

Results: There were 1673 entries to the Reptrax system between Aug 11 and Jul 2012. 579 entries were made by 69 PR, while 1094 entries were made by representatives of surgical or non-pharmaceutical supplies. The median number of PR visits was 3, with a range between 1 and 97. Initial survey response reveals 10 of 25 PR had at least 1 visit to the FHC. 60% of the 10 PR were classified as frequent visiting. 23 pharmaceutical agents were being represented by these 10 PR.

Conclusion: At a 110-bed MTF, PRs visited approximately 3 times per year. Further analyses will determine the influence of PR on the prescribing patterns of providers.

ACPE #: 0126-9999-13-329-L04-P
Learning Objectives:
- Describe the available literature regarding PR’s influence on provider prescribing practices.
- Qualitatively describe PR’s demographics, visitation frequency, and influence on providers’ prescription pattern.


320 - THE IMPACT OF POST-DISCHARGE MEDICATION THERAPY MANAGEMENT (MTM) ENCOUNTERS ON 30-DAY READMISSION RATE
B1. Ambulatory Care
INTRODUCTION: Research has shown that 19.6% of Medicare beneficiaries discharged from a hospital are readmitted within 30 days and 34% are readmitted within 90 days. In 2004, the cost to Medicare for unplanned readmissions was estimated to be $17.4 billion. Medicare Part D prescription drug plans are required to offer medication therapy management (MTM) services to help targeted enrollees avoid drug-related problems and optimize medication benefits. In the Kaiser Permanente Northern California region, over 18,000 Medicare Part D patients were enrolled in the MTM program in 2012 based on eligibility criteria. The percentage of MTM enrollees that received an encounter within seven days after hospital discharge was one of the 2012 Quality Measures proposed by Pharmacy Quality Alliance.

METHODOLOGY: The objective of this study was to assess the impact of MTM encounters within seven days after hospital discharge on 30-day readmission rate. An encounter consisted of reconciling medication profiles, providing counseling and/or making interventions by MTM pharmacists over the phone. Data were extracted for information pertaining to MTM patients discharged from Kaiser Permanente medical services in Northern California between September 2 and December 31, 2012. Subjects were included if they were enrolled in the MTM program and had at least one hospital discharge during the study period. Patients were excluded from the study if they were discharged to hospice, acute rehabilitation or skilled nursing facilities. The intervention group included patients who received an encounter within seven days of discharge. MTM patients who did not receive an encounter within seven days served as the control group. Readmission rates were compared between the intervention group and the control group. The primary endpoint was 30-day all-cause readmission rate. In the sub-analysis, 30-day readmission rates were compared based on early (Day 1-7) versus late (Day 8-14) encounters and primary hospital discharge diagnosis. Day 0 was defined as the day of the hospital discharge. Chi-Square Test was used to determine statistical significance.

RESULTS AND CONCLUSION: The total sample size was 1480. Results and conclusion will be presented.

ACPE #:0126-9999-13-330-L01-P
Learning Objectives:
- Describe the overall impact of post-discharge MTM encounters on 30-day readmission rate
- Explain how early (Day 1-7) versus late (Day 8-14) MTM encounters can affect readmission rates


321 - PREPAREDNESS OF STUDENT PHARMACISTS IN PROVIDING TRAVEL HEALTH SERVICES AT AN INDEPENDENT COMMUNITY PHARMACY

B2. Community Practice

Presented by:

Stephanie Liang, PharmD
Western University of Health Sciences
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Presenting on Tuesday, May 14 at 11:00 AM in Sunset V

Introduction
Travel health services is an important emerging field in pharmacy as international travel has increased with globalization. At this time, providers of travel health services range in degrees, specialties, and certifications. Although a Certificate in Travel Health (CTH) is available, specialized certification or licensure to provide travel health services is not required. Questions therefore remain as to the amount of training necessary to provide such services. The purpose of this study is to examine if student pharmacists are as prepared and able as pharmacists to provide travel health services.

Objectives
Study objectives will examine: 1) self-perceived level of student pharmacist preparedness towards providing travel health services, 2) correlation of student pharmacist preparedness with outcomes (e.g. acceptance and refusal rates of recommendations, post-travel screening of risk exposure) and 3) comparison of outcomes between types of providers.

Methodology
This study consists of two phases: a prospective survey and a retrospective review of patient charts. The prospective survey was administered to approximately fifty student pharmacists who have completed a rotation at this site. In order to determine student pharmacist preparedness, survey questions were designed to assess comfort level and confidence in pre-travel risk assessment, travel related vaccine and medication recommendations, vaccine administration, and screening patients post travel. Student demographics are also included in this survey. The retrospective review consists of an analysis of approximately 600 patients in the clinic’s database, spanning visits from 2008 to 2012. All data has been input into Excel® and will be analyzed using basic descriptive statistics (e.g. mean, median, mode, standard deviation). In order to compare student pharmacists’ ability to provide travel health services to that of pharmacists, clinic data has been sorted by provider type and will be analyzed according to acceptance and refusal rates to recommendations and patient outcomes post travel. Prospective survey data will also be correlated to these patient outcomes.

Results to be presented

Conclusions
This study hypothesizes that there will be no difference in patient outcomes related to the type of provider indicating that student pharmacists are as prepared and able to provide travel health services as pharmacists.

ACPE #:0126-9999-13-331-L04-P

Learning Objectives:
- Describe how students perceive their preparedness in providing travel health services following an experiential rotation in community pharmacy travel health clinic.
- Explain the differences in patient outcomes relative to provider type in travel health services.


322 - AN EVALUATION OF NARCOTIC USE FOR CHRONIC PAIN IN THE LONG BEACH VETERAN POPULATION

A5. Neuro-Psych or Pain Management Agents

Presented by:

Justine Lin, PharmD
VA Long Beach Healthcare System
Presenting on Wednesday, May 15 at 8:00 AM in Palm III

Introduction: VA Long Beach Healthcare System implemented a quantity limit of 180 tablets of short acting opioids for all non-cancer patients on Nov 17, 2011. The purpose of this policy was to improve medication management of patients with chronic pain, prevent opioid abuse and diversion, and to create checks in pain management before dependence occurs. A quantity limit of 180 tablets per month allows patients to consume up to 6 units of short acting narcotic daily for breakthrough pain. However, no studies have been conducted to evaluate the impact of this policy change. The results of this retrospective study will identify whether a limitation on short acting narcotics will affect prescribing patterns and decrease total daily oral morphine equivalents. If so, this policy change can be carried across to other VA hospitals to improve patient safety.

Methodology: This is a retrospective chart review study. Patients who received prescription(s) of short acting opioid from May 1, 2011 to May 1, 2012 will be included in this study. Index date is defined as the policy implementation date, November 17, 2011. Inclusion criteria include: patients with non-cancer pain on chronic opioid use who received greater than 180 tablets of short acting opioid prior to the index date and up to 30 days post index date. From this information, we will exclude patients who were with a diagnosis of active cancer and were receiving care from Hematology/Oncology service during the study period. Patients who were solely receiving long acting opioids; patients who received no more than 180 tablets of short acting narcotic and/or were on opioid therapies for less than 3 months prior to index date will also be excluded. Data collected from chart review include: patient demographics (patient age, gender, race, body mass index), pertinent diagnoses of pain such as general pain, back pain, neuropathic pain) and chronic comorbidities (hypertension, hyperlipidemia, diabetes, osteo/rheumatoid arthritis, depression, PTSD). Opioid prescription profile and total daily oral morphine equivalents pre and post index date data will be collected. Other outcome variables include addition or removal of a short acting opioid(s) and/or long acting opioid(s), emergency room visits with a chief complaint of pain, clinic visits (primary care and mental health) with a chief complaint of pain, and pain score following the index date. Descriptive statistics as well as statistical analyses such as paired t-test, chi-square/Fisher exact test, and other non-parametric tests will be performed as necessary.

Results: Data to be presented.

Conclusion: The final results and conclusion will be reported after data collection and analysis have been performed.

ACPE #: 0126-9999-13-332-L01-P

Learning Objectives:
- Describe the impact of opioid quantity restriction policy on prescribing patterns at VA Long Beach Healthcare System.
- Describe the impact of opioid abuse and diversion in the United States.

Background: Erythropoiesis-stimulating agents (ESAs), epoetin alfa and darbepoetin alfa, are commonly used for erythropoietic support in renal anemia, myelodysplastic syndrome, and cancer-associated anemia. At the VA Long Beach Healthcare System (VALBHS), ESA therapy is used in the Anemia Management, Hematology/Oncology, and Dialysis clinics. In July 2011, a formulary conversion from epoetin alfa to darbepoetin alfa was approved by the VALBHS P&T Committee. Following the conversion, a study was conducted at VALBHS evaluating clinical and economic outcomes in 83 patients who were converted from epoetin alfa to darbepoetin alfa. The study found a statistically significant increase in the number of blood transfusions needed after the conversion to darbepoetin alfa, but minimal differences in hemoglobin levels, iron panels, and blood pressure and heart rate changes. The total cost of darbepoetin alfa was computed and shown to be higher than that of epoetin alfa. The objective of this study is to compare the clinical and economic outcomes between Epogen®/Procrit® (epoetin alfa) versus Aranesp® (darbepoetin alfa) in chronic-use, non-hemodialysis patients.

Methods: This is an IRB approved, retrospective chart review study. Patients who were on epoetin alfa chronically, defined as at least three consecutive months of therapy, from June 1, 2010 – May 31, 2011, and patients who were on darbepoetin alfa chronically, as defined above, from January 1st, 2012 – December 31st, 2012, will be included in the study. Patients who will be excluded will be those who were not on ESAs chronically (less than 3 months) or patients who were on hemodialysis and/or transferred to hemodialysis care during the study periods. Medical records of subjects that meet the inclusion and exclusion criteria will be utilized for chart review. Baseline characteristics such as age, gender, race, weight, BMI, comorbidities, concurrent medical history, and total length of ESA therapy will be collected. Data such as CBC, blood pressure, heart rate, iron panel, thyroid panel, B12/folate levels, stool guiacs, use of iron and/or ascorbic acid medications, and number of blood transfusions given (if any) will be extracted. Descriptive statistics will be performed. Clinical comparisons will be evaluated using t-test and/or Chi-Square tests as appropriate. Economic outcomes will be determined by the comparison of the drug costs and costs associated with blood transfusions during epoetin alfa and darbepoetin alfa therapy.

Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-333-L01-P

Learning Objectives:
- Describe the clinical effectiveness of chronic use Epogen/Procrit (epoetin alfa) versus Aranesp (darbepoetin alfa) in non-hemodialysis patients at VA Long Beach Healthcare Systems
- Describe the budgetary impact of Epogen/Procrit (epoetin alfa) versus Aranesp (darbepoetin alfa) to the VA Long Beach Healthcare System


324 - IMPACT OF TWO PHARMACY TECHNICIANS ON THE MEDICATION RECONCILIATION PROCESS AT SFVAMC

B4. General Clinical Practice

Presented by:

Caroline Lindsay, PharmD
San Francisco Veterans Affairs Medical Center
Introduction: Medication reconciliation is an important part of reduction of medication errors in the hospital. The Joint Commission has included medication reconciliation in the 2012 National Patient Safety Goals (NPSG) – Hospital Accreditation Program 03.06.01, under the heading of maintaining and communicating accurate medication information. Pharmacists are the ideal healthcare professionals to complete medication reconciliation, because of their unique knowledge of medication regimens and drug interactions.

In 2008, a study at SFVAMC found that pharmacist-conducted patient interviews were a key part of the medication reconciliation process. Although it would be ideal for clinical pharmacists to complete all of the patient interviews themselves, the acute care services at SFVAMC are often very busy, and the pharmacists have numerous competing responsibilities. Pharmacy technicians have been utilized in other hospital settings to complete patient interviews, freeing up the pharmacists to reconcile the medication lists, provide interventions, and counsel the patient upon discharge. To help meet the NPSG, one pharmacist FTE and two pharmacy technician FTEs were hired to complete medication reconciliation. The two pharmacy technicians were trained to extract medication histories from the patient’s chart, complete a patient interview to verify the history, and document their findings as a note in the medical record.

Methodology: The impact of the pharmacy technicians will be assessed retrospectively by evaluating the presence or absence of medication history, medication reconciliation, and discharge counseling notes in the medical record by pharmacists and technicians from March 13, 2011 to June 12, 2011 (prior to implementation of the technicians) and March 13, 2012 to June 12, 2012 (after their implementation). Discrepancies between the medication history obtained by the technician and that obtained by the provider will be categorized and tallied.

Results: Data collection is in progress. Results will be presented at the 2013 Western States Conference for Pharmacy Residents and Preceptors

ACPE #:0126-9999-13-334-L01-P

Learning Objectives:
- Describe the role of the pharmacy technician in the medication reconciliation process at SFVAMC.
- Describe the types of discrepancies between pharmacy technician-collected medication histories and those collected by a provider


325 - EVALUATION OF AN EMERGENCY DEPARTMENT PHARMACIST-MANAGED PROTOCOL FOR ADJUSTMENT OF EMPIRIC UTI ANTIMICROBIAL THERAPY

A1. Infectious Disease - Anti-infective Agents

Presented by:

Sadie Linford, PharmD
The University of Montana - St. Patrick Hospital
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Presenting on Wednesday, May 15 at 9:00 AM in Dockside
Background: Uncomplicated urinary tract infection (UTI) is a common infection in the United States and results in millions of ambulatory and emergency department (ED) visits annually. Various clinical pharmacy services have been described in the ED for decades. The ED pharmacist is able to play an important role in antimicrobial stewardship in the ED.

Currently emergency department (ED) pharmacists in our community hospital ED review all cultures using a daily antimicrobial culture monitoring report. Cultures with pathogens resistant to prescribed empiric therapy are then brought to the attention of the ED physician who adjusts therapy as necessary. This process can be slow and result in suboptimal patient care.

Purpose: The objective of this study is to determine whether the adjustment of antimicrobial therapy by the ED pharmacist based on culture and sensitivity, through the implementation of a pharmacist-led protocol, decreases time to patient notification and antimicrobial change, rates of treatment failure, and readmission rates.

Methods: This study has two distinct phases: baseline data collection prior to protocol implementation and post-intervention data collection. The institution’s electronic medical record system (EMR) will be used to identify patients who provided a urine sample during their ED visit that was cultured. Patients excluded from the study will be those that are admitted, <18 years old, pregnant, or with chronic catheter placement.

During the first phase, data will be collected retrospectively from the EMR and include patient age, gender, diagnosis, culture and sensitivity, antimicrobial therapy prescribed, and known allergies/intolerances. Additionally, the patient will be contacted by telephone within 30 days of discharge, and information collected included if the ED prescription was filled, if symptoms resolved, any side effects experienced, if an additional medical visit was made, if additional antibiotics were prescribed, and when the additional antibiotics were initiated if applicable.

Prior to second phase data collection, a pharmacist-led protocol to adjust therapy based on culture and sensitivity will be implemented. The protocol will guide the ED pharmacist in making antimicrobial adjustments if the culture and sensitivity demonstrates a pathogen resistant to the antimicrobial prescribed in the ED. Data identical to that collected before protocol implementation will be collected.

Results: Fifty-one patients met inclusion criteria for Phase I data collection. The average number of days from discharge until culture review and follow-up if needed by an ED pharmacist was 3.98 days (range, 2 – 11 days). The average time spent by the pharmacist reviewing each culture and sensitivity for appropriateness was seven minutes (range, 5 – 25 minutes). When contacted by phone, 15.7% (8/51) of patients stated they did not experience symptom resolution after finishing the antibiotic prescribed to them in the ED and 37.3% (19/51) did make an additional visit to a provider. Of those that made an additional visit, 47.3% (9/19) received an additional antibiotic. Results of Phase II data collection and comparisons between Phase I and II data will be presented.

Conclusion: To be presented.

ACPE #:0126-9999-13-335-L01-P
Learning Objectives:
- Explain the importance of culture review and follow-up for patients discharged from the emergency department.
- Describe the advantages of pharmacist-managed adjustment of empiric UTI antimicrobial therapy in your emergency department as it relates to antimicrobial stewardship.


326 - EVALUATION OF ADVERSE DRUG REACTIONS BETWEEN SUBCUTANEOUS AND INTRAVENOUS ADMINISTRATION OF BORTEZOMIB
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic
Presented by:

Mario Listiawan, PharmD
Kaiser Permanente Medical Care Program – Inland Empire Oncology Pharmacy Practice
mario.listiawan@kp.org

Presenting on Wednesday, May 15 at 9:00 AM in Sunset I

Introduction: On January 23, 2012, the FDA approved the subcutaneous administration of bortezomib based on a published study that demonstrated non-inferiority in efficacy between subcutaneous and intravenous administration. Intravenous administration has been the standard administration for bortezomib, but the need for repeated intravenous access or insertion of long term central venous access may result in surgical intervention and increased risk of line infections to patients. Subcutaneous administration may offer a more convenient route of administration, provide economic benefits, and decrease the incidence of peripheral neuropathy.

Objectives: The purpose of this study is to determine if there are differences in adverse drug reactions between the two administration methods, and to determine which administration method of bortezomib is preferred in treating multiple myeloma. This study aims to validate and expand the result of the study that led to the approval of the subcutaneous administration of bortezomib.

Methods: This study has been approved by the Kaiser Permanente Institutional Review Board. This is a multicenter retrospective study conducted in the Kaiser Permanente Southern California Region. Data will be extracted from the electronic medical record from January 1, 2012 to March 31, 2013. Inclusion criteria include patients age 18 years or older with confirmed diagnosis of multiple myeloma, received bortezomib as monotherapy or in combination with dexamethasone, and received a minimum of three treatment cycles with bortezomib. The following data will be collected on each patient: age, gender, diagnosis, bortezomib regimen, route of administration, number of cycles with bortezomib, adverse drug reactions (peripheral neuropathy, thrombocytopenia, and diarrhea), injection site and infusion reactions, serum M protein, serum free light chains, and serum creatinine.

Statistical Analysis: The primary endpoints are to determine if there are differences in adverse drug reaction profiles between the two administration methods of bortezomib, and quantify the discontinuation rate of treatment due to injection site reactions or infusion reactions. The primary endpoints will be assessed using Wilcoxon Rank-Sum Test. The secondary endpoints will evaluate the differences in response to therapy and progression of disease between the two administration methods of bortezomib, which will be assessed using Fisher’s Exact Test.

Results and Conclusion: Results and conclusion of the study will be presented.

ACPE #:0126-9999-13-336-L01-P
Learning Objectives:

- Explain the differences of adverse drug reactions between intravenous and subcutaneous administration methods of bortezomib (Velcade).
- Describe if differences exist in response of therapy and progression of disease between intravenous and subcutaneous administration methods of bortezomib (Velcade).

327 - ASSESSING THE EMDICATION THERAPY MANAGEMENT (MTM) TRAVEL BARRIER, A COMPARATIVE EFFECTIVENESS STUDY: ON-SITE SERVICES VERSUS SERVICES IN A COMMUNITY PHARMACY AND EFFECT ON UTILIZATION BY SENIORS IN INDEPENDENT LIVING FACILITIES

B2. Community Practice

Presented by:

Crystal Little, PharmD
Fred Meyer/Oregon State University PGY1 Community Residency Program
crystal.little@fredmeyer.com

Presenting on Tuesday, May 14 at 11:30 AM in Sunset V

Objectives:
The primary objective is to assess the potential impact of travel on patient uptake into MTM services by comparing the effectiveness of two different methods of service provision (on site vs. community pharmacy). The outcome will be assessed by between-group percent utilization of MTM services. Secondary outcomes include perceived impact of an educational presentation and interest in MTM. These outcomes will be assessed using the results of a brief survey.

Methods:
Recruitment will be performed by advertisement and voluntary senior attendance to a presentation about medication safety and MTM at two independent living facilities in Clark County, WA. After the presentation participants will complete a survey and be given a voucher that can be exchanged for an MTM appointment with a pharmacist at no cost to the patient. Groups will be determined by recruitment site. Group 1 will receive MTM services at a near-by community pharmacy while group 2 will receive on-site MTM services to eliminate the travel barrier.

Preliminary Results and Implications:
A Fisher’s Exact chi-squared test will be used to compare group rates of utilization of MTM services. Descriptive statistics will be used to assess the survey. The results of this study may provide data to support collaboration between community pharmacies and independent living facilities in order to provide MTM services and increase rates of service utilization. Although travel is just one barrier to MTM it is potentially a large barrier for the elderly. Increasing rates of utilization is important because appropriate use of medications can increase cost saving and cost avoidance, increase the proportion of people meeting health goals, and decrease utilization of emergency medical services.

ACPE #:0126-9999-13-337-L01-P

Learning Objectives:
- Describe the potential impact that a travel barrier may have on MTM services
- Explain one way that pharmacists can change rates of uptake into MTM services


328 - ASSESSMENT OF HOSPITAL IMPLEMENTED DOSING PROTOCOL FOR THE TREATMENT OF ALCOHOL WITHDRAWAL

B4. General Clinical Practice
Presenting by:

Joe Llewellyn, PharmD
University of New Mexico Hospital
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Presenting on Wednesday, May 15 at 8:30 AM in Royal II

Background: Benzodiazepines are the drug of choice for the treatment of alcohol withdrawal syndrome (AWS). Evidence supports the use of a symptom-triggered therapy (STT) administration strategy compared with scheduled dosing of benzodiazepine in AWS patients. The Clinical Institute Withdrawal Assessment for Alcohol-Revised (CIWA-Ar) is the most widely used scoring system scale to assess AWS and to facilitate STT dosing. There is a lack of literature regarding the effectiveness of a specific nurse-driven CIWA-Ar STT dosing protocol. The objectives of the study are to determine the percentage of patients who are properly sedated using the hospital developed dosing protocol along with the CIWA-Ar assessment scoring and to assess the clinical utility of the nurse-driven CIWA-Ar dosing protocol.

Methods: A retrospective chart review was conducted on all patients admitted to the hospital with a primary diagnosis of AWS between 12/26/2011 and 5/23/2012. All subjects that received treatment with the CIWA-Ar STT dosing protocol, verified by an order set within the electronic record were included. The following data were collected: patient age, gender, ethnicity, co-morbidities, history of prior admissions for AWS, seizure and psychiatric history, other substance abuse, cirrhosis or clinical suspicion for liver disease, CIWA-Ar scores, doses and administration frequencies of lorazepam and chlordiazepoxide, transfers to the intensive care units, and initiation of lorazepam infusions.

The patients’ charts were assessed for accuracy and appropriateness of medication administration and CIWA-Ar evaluation. The charted CIWA-Ar scores and administered doses and frequencies of lorazepam and chlordiazepoxide were recorded and compared to the established CIWA-Ar STT hospital protocol. Results and conclusions will be presented.

ACPE #:0126-9999-13-338-L01-P
Learning Objectives:
- Describe the efficacy of a CIWA-Ar nurse-driven protocol for the treatment of alcohol withdrawal.
- Describe the utility and appropriateness of a nurse-driven CIWA-Ar protocol.


329 - EFFICACY OF SPIRONOLACTONE FOR ACHIEVING BLOOD PRESSURE CONTROL IN AFRICAN AMERICANS WITH RESISTANT HYPERTENSION

Presented by:

Kathleen Lo, PharmD
Kaiser Permanente West Los Angeles
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Presenting on Wednesday, May 15 at 4:00 PM in Sunset V
Introduction: In the United States, the prevalence of hypertension and its associated morbidity and mortality is especially high in African Americans. At Kaiser Permanente Southern California, data from 2011 showed that there was a 5.3% disparity between rates of blood pressure control for African Americans vs. whites. Targeting this gap is particularly important because African Americans constitute a high risk group associated with 3 to 6 times greater risk of fatal stroke, 1.5 times greater risk of fatal heart disease, and 5 times greater risk of end-stage renal disease than their non-African American counterparts with hypertension. In several studies, spironolactone has demonstrated significant additive blood pressure reduction in African Americans with resistant hypertension (defined as uncontrolled blood pressure in patients on at least 3 antihypertensive medications). However, a Kaiser regional analysis of drug therapy for this population showed that although almost 60% were on three or more antihypertensives, only 3% were prescribed spironolactone.

Methodology: The objective of this study was to evaluate the efficacy of pharmacist-based spironolactone titration on improving blood pressure control rates in African Americans with resistant hypertension. Using an electronic medical record system, African Americans patients with resistant hypertension were identified and chart reviews were conducted to identify appropriate candidates for pharmacist-based spironolactone titration under existing Kaiser Permanente protocol. Pharmacists followed patients both in Hypertension clinic and by telephone to monitor blood pressure progress and to order appropriate follow-up labs including electrolyte levels and serum creatinine. This pilot study consisted of retrospective data analysis comparing the percentage of African American patients with controlled blood pressure pre and post implementation of spironolactone titration and pharmacist intervention.

Results/Conclusion: The primary outcome of interest was the change in the percentage of targeted patients who achieved controlled blood pressure (< 140/90 mmHg) after spironolactone titration. Secondary outcomes included the change in the rate of blood pressure control for this population after any type of pharmacist intervention including adherence counseling, diet and exercise counseling, or non-spironolactone medication adjustments. Preliminary results will be discussed.

ACPE #:0126-9999-13-339-L01-P
Learning Objectives: Explain the efficacy of spironolactone titration in managing African Americans patients with resistant hypertension. Identify the role of a pharmacist in managing African Americans with resistant hypertension.


330 - MEDICATION WASTE AT A REMOTE PHARMACY PRODUCTION FACILITY
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

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Presenting on Wednesday, May 15 at 5:00 PM in Sunset III

Background: The demand for quality healthcare is increasing and with that comes an increasing level of cost associated with that healthcare. The UCSF Medical Center utilizes an off-site pharmacy production facility located four miles away from the main institution and is responsible for providing medication to a 722-bed hospital. Currently, this off-site pharmacy has no means of documenting or assessing the amount of medication
waste that is generated from the facility. In order to meet the increasing demands for pharmacy budgetary guidelines, a strategy must be implemented in order to assess the quantity of medication waste being produced and identify strategies to reduce the waste being generated on a daily basis.

Objective: To summarize the costs of medication waste originating from the UCSF Mission Bay pharmacy production facility with a focus on identifying inefficiencies and opportunities for waste reduction and efficiency improvement.

Methods: A two-month long analysis of wasted medications was conducted from the Mission Bay remote pharmacy facility targeted at three high volume subsets of the pharmacy – the intravenous compounding sterile preparation area, the enteral solutions compounding area, and medication waste generated from the SWISSLOG automated drug management system. A retrospective report was run using EPIC EHR software to identify medication orders that were prepared by pharmacists in the intravenous and enteral solutions preparation areas that were subsequently discontinued and not administered to the respective patients. Medications that were prepared by the pharmacy and later not administered to the patient were assumed to be waste. Physical medication waste generated during the preparation process was documented by pharmacists on a daily basis. Lastly, unusable unit-dosed medications prepared by the SWISSLOG or those medications that were retuned to the SWISSLOG inventory and determined to be unusable were captured and analyzed.

Results: Data analysis is currently ongoing.

Conclusions: To be discussed.

ACPE #:0126-9999-13-340-L01-P
Learning Objectives:
  - Explain the importance of identifying medication waste in a pharmacy.
  - List proposed solutions to address the medication waste issues surrounding medication preparation from a remote pharmacy production facility.


331 - METABOLIC MONITORING OF ATYPICAL ANTIPSYCHOTICS WITHIN A PHARMACY REFILL SERVICE PROGRAM
A5. Neuro-Psych or Pain Management Agents

Presented by:

Courtenay Looper, PharmD
Providence Health & Services, Oregon Region
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Presenting on Wednesday, May 15 at 11:30 AM in Palm III

Introduction:
First-generation antipsychotics (FGA) are known to cause numerous side effects. The advent of second-generation antipsychotics (SGA) or “atypical antipsychotics” appeared promising until metabolic side effects began to surface. SGAs are associated with weight gain, dyslipidemia, diabetes, metabolic syndrome, increased cardiovascular risk, and other complications. The ADA-APA-AACE-NAASO consensus statement recommends baseline screening and ongoing monitoring of patients on SGAs. However, studies demonstrate metabolic monitoring to be poor and reported adherence to the consensus recommendations is 50% at best. The Providence Medical Group (PMG) clinical pharmacy department provides refill medication monitoring through a Centralized Refill Service (CRS) program monitoring protocol. Refill requests are authorized by the CRS
if the requirements for laboratory tests are met and a primary care provider office visit has occurred within the last year.

Objectives:
1. Comparisons of the following for CRS clinics as compared to non-CRS clinics:
   a. Prevalence of metabolic monitoring for SGA refills
   b. Prevalence of metabolic conditions in patients taking SGAs
   c. Mean change in A1c, plasma glucose, blood pressure, lipid values and BMI
2. Identify providers’ action in response to CRS monitoring when triggered by SGA refills

Methods:
This is a retrospective cohort study of patients followed at a PMG clinic, with or without CRS, during April 1, 2009 to March 31, 2012. Eligible patients aged 18-65 years and taking a SGA (aripiprazole, olanzapine, quetiapine, risperidone, ziprasidone, paliperidone) will be enrolled. Patients diagnosed with Alzheimer’s or dementia will be excluded. A sample size of 184 patients is needed to detect a 0.15 difference in monitoring rates with a 0.95 confidence interval and power of 0.8. Laboratory results and vital signs (A1c, plasma glucose, blood pressure, lipid panel, weight, body mass index), metabolic diagnoses (diabetes, hyperglycemia, dyslipidemia, hypertension, obesity) and SGA medication history will be collected using an electronic health record.

Results/Conclusion:
The prevalence of metabolic monitoring, metabolic conditions, and mean change in metabolic parameters for patients seen at CRS and non-CRS clinics will be reported. Identified provider response to CRS monitoring prompts for CRS clinics will also be reported.

ACPE #:0126-9999-13-341-L01-P
Learning Objectives:
List metabolic side effects associated with the use of second-generation antipsychotics.
Describe the role of a pharmacy centralized refill service program in the metabolic monitoring of second-generation antipsychotics.


332 - COMPARATIVE EFFECTIVENESS OF BOCEPREVIR AND TELAPREVIR IN THE TREATMENT OF GENOTYPE 1 CHRONIC HEPATITIS C INFECTION
A1. Infectious Disease - Anti-infective Agents

Presented by:
Aimee Loucks, PharmD
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Presenting on Wednesday, May 15 at 9:30 AM in Dockside

Introduction
Two new protease inhibitors, boceprevir and telaprevir, were approved in May 2011 for the treatment of chronic hepatitis C genotype 1 infection. Clinical trials have demonstrated that these medications, when added to pegylated interferon alfa and ribavirin, improved efficacy when compared to pegylated interferon alfa and ribavirin alone. Currently, there are no published clinical trials that compare boceprevir and telaprevir. The
The purpose of this study is to compare the effectiveness and safety of boceprevir and telaprevir and to determine how patient demographics and clinical characteristics affect outcomes.

**Methodology**

Data for this trial were obtained using a combination of outpatient medical records, pharmacy data, and laboratory data from patients in a managed care setting. Patients at least 18 years of age with a diagnosis of hepatitis C genotype 1 infection who initiated therapy with boceprevir or telaprevir from June 2011 to November 2012 were included in this analysis. Exclusion criteria included patients infected with hepatitis B or human immunodeficiency virus and patients who are status post-liver transplant. The primary effectiveness endpoint for this trial is rapid virologic response (RVR). RVR is defined as an undetectable viral load after four weeks of treatment with boceprevir or telaprevir. This was chosen as the primary outcome because it is an early marker of virologic response and a strong predictor of sustained virologic response (SVR) or relapse. Secondary effectiveness endpoints include extended RVR, end-of-treatment response, and SVR. The primary safety endpoint is premature discontinuation due to medication-related intolerance or adverse event. Patient demographics will be presented with t-tests (or Wilcoxon rank sum) for continuous variables and Chi-square (or Fisher’s exact test) for categorical variables. Effectiveness endpoints will be assessed using logistic regression and Cox-proportional hazard modeling. Discontinuation will be evaluated using Cox-proportional hazard modeling. Effectiveness and safety results will be stratified by previous treatment experience and will be adjusted for variables known to influence treatment response, including: age, race, presence of cirrhosis, and viral load at a baseline. IL-28 polymorphism will also be included as an exploratory variable.

**Results**

A total of 1,249 patients were identified as having at least one fill for boceprevir (n=534) or telaprevir (n=715) in the evaluated time period. Of these, 63% of patients were male and 37% of patients were female; 64% self-identified as white, 14% as black, 11% as Hispanic, 5% as Asian, and 6% as other/unknown. The average age (range) for these patients was 56 years (20 to 80 years). Effectiveness and safety results are pending.

**Conclusion**

Conclusion is pending based on the results of the analysis.

**ACPE #:0126-9999-13-342-L01-P**

**Learning Objectives:**

- Explain differences in the effectiveness and safety of boceprevir and telaprevisr for the treatment of chronic hepatitis C genotype 1 infection.
- Describe patient characteristics that may affect their response to therapy with boceprevir and telaprevir.


**333 - ASSESSMENT OF THE REVERSIBILITY OF ABELCET® (ABLC) INDUCED NEPHROTOXICITY**

A1. Infectious Disease - Anti-infective Agents

Presented by:

Jessica Love, PharmD
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*Presenting on Wednesday, May 15 at 10:00 AM in Dockside*
Introduction:
Of the 4500 cases of Coccidioidomycosis (cocci) reported in California by the end of 2010, almost 2000 cases were from Kern County. Being that Kern County has the most reported cases of cocci in California, Kern Medical Center (KMC) provides care to a large number of these patients. ABLC, a lipid complex amphotericin B, is the formulary drug at KMC for the treatment of severe cases of this infection. The most common and potentially devastating adverse reaction observed with this agent is nephrotoxicity. Several studies have been performed comparing various amphotericin formulations and their nephrotoxic effects with varying results and questionable outcomes regarding the long-term effects and reversibility of nephrotoxicity.

Methodology:
Retrospective chart reviews were performed for every patient >18 years of age who received ABLC from July 1, 2007 to November 31, 2012. Patient demographics, weight, and baseline and follow-up serum creatinine (SCr) were assessed. The following information was also collected: indication for use, location of therapy (inpatient vs. outpatient), dose, frequency, duration of treatment, and time since completion of therapy. Co-morbidities and concurrent nephrotoxic agents were evaluated to identify confounding nephrotoxic factors. Nephrotoxicity (recorded from start of therapy through the end of evaluation period) was defined as greater than two times baseline SCr value. The peak SCr value also had to be greater than 1.2mg/dL to meet the criterion for nephrotoxicity.

Results:
In the process of data collection
Conclusion:
Will depend on data collection outcomes

ACPE #:0126-9999-13-343-L01-P
Learning Objectives:
List risk factors associated with ABLC associated nephrotoxicity
Describe the long-term nephrotoxic effects of ABLC


334 - IMPLEMENTATION AND EVALUATION OF AN INTEGRATED PHARMACIST IN THE NUKA SYSTEM OF CARE AT BENTEH NUUTAH, VALLEY NATIVE PRIMARY CARE CENTER

B1. Ambulatory Care

Presented by:
Sara Low, PharmD
Southcentral Foundation of the Alaska Native Medical Center
slow@scf.cc

Presenting on Wednesday, May 15 at 4:30 PM in Sunset V

Purpose: To implement a clinical pharmacist into the integrated care teams (ICTs) at Benteh, Nuutah, Valley Native Primary Care Center (VNPPC) for four weeks and to evaluate the results to propose best practices for future pharmacist integration.

Methods: This quality assurance/quality improvement project was deemed “not research” by the Alaska Area Institutional Review Board. The pharmacist served as a medication resource for the ICTs, provided direct customer-owner care, and conducted prospective chart review. Pharmacist interventions were tracked and
Results: Consultation and electronic health record support occupied most of the pharmacist’s time. Each ICT member utilized the pharmacist differently. Co-location increased access to clinical pharmacy services. ICTs valued job satisfaction & access to clinical pharmacy services more and electronic health record support & decreased office visit time less after integration. ICTs expressed unanimous support to keep the integrated pharmacist.

Conclusions: The integrated pharmacist has been accepted as a standard of care at Benteh Nuutah, VNPCC. Integrated pharmacy services have been expanded to offer anticoagulation services with plans for population-based and cost savings initiatives. The intervention tracking tool has been modified to streamline intervention categories and track time spent on each intervention. This project has highlighted the value of integrated pharmacy services and enhanced relationship-based healthcare at Southcentral Foundation.

ACPE #:0126-9999-13-344-L01-P

Learning Objectives:

- Explain the role of a pharmacist on an integrated care team.
- State at least two ways the pharmacist can benefit the integrated care team.


335 - THE IMPACT OF PHARMACIST CONSULTATIONS ON CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) READMISSIONS

B4. General Clinical Practice

Presented by:

Alan Lu, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Royal II

Introduction:
Hospital readmissions are a major financial burden to the United States healthcare system. COPD 30-day readmissions in the United States were estimated to be 22.6% for Medicare fee-for-service beneficiaries in 2003 and 2004. The Affordable Care Act may cause further financial constraint due to reduced reimbursements for COPD readmissions. Inhaled medications are the cornerstones for COPD management and are necessary for reducing COPD symptoms, frequency and severity of exacerbations, and improving health status and exercise tolerance. However, studies have documented high rates of improper medication use, which may lead to inadequate COPD control and increased hospitalization. Pharmacist involvement in providing inhaler education, discharge medication reconciliation, and post-discharge follow-up may potentially decrease readmission rates. The objective of this study is to determine the impact of pharmacist consultations on COPD hospital readmission rates through inhaler use education and other transitional care activities.

Methods:
This prospective study will include patients age 18 years and older admitted for COPD related problems between February and April 2013. Eligible patients will be identified by reviewing the hospital census for a COPD diagnosis and by screening medication reports for COPD medications. Patients who provide consent, are capable
of receiving instructions, and discharged to home will receive pharmacist consultations. Consultations will include disease state education, inhaler technique assessment and education, evaluation for appropriate COPD discharge medications, and post-discharge telephone follow-up. The primary outcome will evaluate 30 day readmission rates. Secondary outcomes will measure inhaler technique pre- and post-education. Results and Conclusions will be presented.

ACPE #:0126-9999-13-345-L01-P
Learning Objectives:
  - Describe the impact of pharmacist consultations on the rate of COPD readmissions.
  - Describe the effectiveness of education provided by pharmacists on patient knowledge of inhaler use.


336 - ADHERENCE, PERSISTENCE, AND OUTCOMES OF ORAL SORAFENIB THERAPY AT VA PALO ALTO HEALTH CARE SYSTEM (VAPAHCS)
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Kimberly Lui, PharmD
Veterans Affairs Palo Alto Health Care System
Kimberly.Lui@va.gov

Presenting on Wednesday, May 15 at 9:30 AM in Sunset I

Background: Although sorafenib is the first systemic oral chemotherapy agent indicated for the treatment of hepatocellular carcinoma, adherence to and tolerance of sorafenib therapy in a naturalistic setting remains unclear. Due to differences in age and the possible differences in organ function and comorbidities, the results of the sorafenib phase III trials and previous studies on adherence to oral chemotherapy may not be readily applicable to our unique veteran population. Thus, further studies on patterns of adherence, persistence, and outcomes of sorafenib therapy in the veteran population are needed to better understand how this transition to oral chemotherapy as a chronic medication has impacted the treatment of cancer patients at VAPAHCS. The objectives of this project were (1) to determine the rate of medication adherence to sorafenib as measured by Medication Possession Ratio (MPR), (2) to determine persistence on sorafenib treatment and time from treatment discontinuation until death, and (3) to determine efficacy and safety outcomes of oral sorafenib in the veteran population.

Methodology: This was a retrospective study. All patients initiated on sorafenib for hepatocellular carcinoma from 12/2005 to 8/2012 at VA Palo Alto Healthcare System were included in the chart review. Patients were excluded if they were lost to follow-up during sorafenib treatment due to transfer of care. Adherence as measured by medication possession ratio (MPR) was calculated using data from electronic prescription records and adjusted for days of hospitalization. MPR was calculated as the number of medication days supplied divided by the total duration of treatment. Demographics, efficacy parameters, safety parameters, and persistence data were collected via electronic chart review.

Results: A total of 41 patients were included in the study. Mean MPR was 0.90 ± 0.31. However, MPR calculation may be inflated due to sorafenib interruptions during treatment. Forty-one percent of patients had sorafenib held per their provider during treatment, 32% of patients self-discontinued the medication during treatment, and 10% had a treatment interruption due to situational factors. Median persistence on sorafenib therapy was 3.1 ± 6.1 months. Median time from discontinuation of sorafenib until death was 2.4 ± 5 months. The median
time to symptomatic progression was 4 ± 12.3 months and the median time to radiologic progression was 4 ± 9.2 months. The median duration of overall survival was 7.4 ± 11.6 months. The overall incidence of adverse effects was 88%, with the most common adverse effects reported being diarrhea (34%), nausea (27%), fatigue (24%), and rash or desquamation (24%). Thirty-three percent of patients discontinued sorafenib permanently due to adverse effects and 5% discontinued sorafenib permanently due to adverse effects and disease progression.

Conclusions: Final results and conclusions will be presented.

ACPE #:0126-9999-13-346-L01-P
Learning Objectives:
- Describe adherence to sorafenib therapy in the VAPAHCS population.
- Describe the prescribing patterns of sorafenib for hepatocellular carcinoma in the veteran population at VAPAHCS.


337 - PHARMACIST IMPACT ON COLLABORATIVE OSTEOPOROSIS CARE FOR VETERANS AT HIGH FRACTURE RISK

B4. General Clinical Practice

Presented by:

Emily Luk, PharmD
VA Northern California Health Care System
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Presenting on Wednesday, May 15 at 9:30 AM in Royal II

BACKGROUND: A report by the Department of Veterans Affairs (VA) Office of the Inspector General revealed that men are less likely to receive osteoporosis treatment following a hip or vertebral fracture than women. Utilizing electronic medical records (EMR) to passively collect fracture risk data, a VA researcher developed and validated the VA-Absolute Risk Assessment (VA-ARA) tool to predict fracture risk in males. The VA Sierra Pacific Network (VISN 21) developed an osteoporosis dashboard that calculates fracture risk score using this tool.

PURPOSE: The purpose of the project is to determine the pharmacists’ impact in collaborative osteoporosis care for veterans at high fracture risk. This project will identify a subset of patients at high fracture risks, including veterans greater than 50 years of age with history of non-traumatic fracture who are not on therapy, diagnosis of osteoporosis who are not being treated, those who are osteopenic and have a high 10-year probability of fracture (per National Osteoporosis Foundation definitions), receiving androgen deprivation therapy, have hypogonadism, or are receiving long term glucocorticoid therapy in pharmacological doses. Treatment stratification will be individualized based on patient characteristics and co-morbid conditions, or contraindication to any given treatment option.

METHODS/PROCEDURES: Based on the Endocrine Society and VA osteoporosis guidelines for men, a treatment algorithm was designed and approved by the VISN 21 Pharmacy Benefits Management Committee. A previously developed osteoporosis clinical dashboard has identified 17,532 high risk patients that qualify for treatment based on these guidelines. Pharmacists will assess patient for risk factors and secondary causes for osteoporosis, and recommend appropriate therapy. The impact of the pharmacist on quality outcome measures in this collaborative care setting will be assessed, including the percentage of high risk patients in each category that receive appropriate assessment and therapy.
ANTICIPATED FINDINGS/RESULTS: We anticipate that our results will help extend pharmacists’ role and further improve quality of care to veterans. Results and conclusions will be presented.

ACPE #:0126-9999-13-347-L01-P

Learning Objectives:
- List risk factors associated with increased risk of osteoporosis based on Osteoporosis for Men: An Endocrine Society Clinical Practice Guideline.
- Describe impact of pharmacists in collaborative osteoporosis care in patients at high risk of osteoporosis.


338 - EVALUATION OF PHYSICIAN-DRIVEN VANCOMYCIN DOSING AND MONITORING AT ONE PEDIATRIC HOSPITAL

B6. Pediatric or Gender Specific Care

Presented by:
Emily Lundeen, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Sunset II

Background: In 2009 the American Society of Health-System Pharmacists (ASHP), the Infectious Diseases Society of America (IDSA), and the Society of Infectious Disease Pharmacists published consensus guidelines to evaluate therapeutic monitoring of vancomycin in adult patients. The guidelines recommend maintaining minimum serum concentrations above 10 mg/L to avoid the development of resistance. For more complicated infections, such as bacteremia, endocarditis, osteomyelitis, and meningitis, serum trough concentrations should be between 15-20 mg/L. Levels should be drawn no earlier than steady state – just prior to the fourth dose. While the above stated guidelines do not include pediatric data, many of the recommendations provided may be extrapolated to the pediatric population.

Purpose: The purpose of this study was to determine the effectiveness of initial vancomycin dosing in achieving therapeutic troughs for specified infections or based upon patient diagnoses. Another objective was to measure the appropriateness of vancomycin monitoring by physicians at Cardon Children’s Medical Center.

Methods: Data was collected through a retrospective chart review of admitted patients between zero and 18 years of age who received three or more doses of vancomycin between April 2012 and December 2012. Patients were identified through billing records for vancomycin products during the study time period. A total of 83 patients met inclusion criteria. Based upon diagnosis determined during chart review, patients were identified to have target vancomycin levels between either 10-15mg/L or 15-20mg/L. A therapeutic trough was defined as being drawn within an hour at least prior to the fourth dose administered and not sooner.

Results: Eighty-three pediatric patients receiving 91 courses of therapy met inclusion criteria. Seventeen (18.7%) vancomycin initiations did not have an initial trough drawn. The average number of troughs drawn per days of therapy was 0.25 with the average initial trough level being 9.01 mg/L. The mean duration to achieve therapeutic vancomycin concentrations was 3.8 days and 8.6 doses. Approximately 28 (30.8%) vancomycin initiations never achieved therapeutic level. Forty-six (50.5%) troughs drawn were drawn appropriately. Of the levels drawn appropriately, 37 (80%) were subtherapeutic, 2 (5%) were supratherapeutic, and only 7 (15%) therapeutic.
Conclusion: Current physician initiated vancomycin dosing strategies are not achieving timely, therapeutic concentrations, as defined by ASHP. A pharmacist-initiated dosing protocol has been proposed to increase the number of initial therapeutic troughs and decrease the number of levels drawn per patient.

ACPE #:0126-9999-13-348-L01-P
Learning Objectives:
  Describe current vancomycin treatment recommendations for pediatric populations.
  Summarize recommended improvements in the dosing and monitoring of vancomycin in pediatric populations.


339 - UTILIZING STUDENT PHARMACISTS AND COMPUTERIZED DECISION SUPPORT TO IMPROVE INPATIENT PNEUMOCOCCAL AND INFLUENZA IMMUNIZATION RATES

B4. General Clinical Practice

Presented by:
Mary Luttropp, PharmD
Legacy Health
mluttrop@lhs.org

Presenting on Wednesday, May 15 at 10:00 AM in Royal II

Background:
Pneumococcal and influenza disease contribute to nearly 675,000 hospitalizations, 50,000 deaths, and billions of dollars in health care costs annually in the United States. As a result the Centers for Medicare and Medicaid Services have adopted global immunization core measures and Healthy People 2020 includes goal pneumococcal and influenza immunization rates of 90%. Hospitals nationwide are seeking strategies to maximize immunization rates. While the implementation of standing order protocols has shown increases in pneumococcal and influenza immunization rates, most hospitals continue to struggle with reaching goal rates.

The current pneumococcal and influenza immunization rates at Legacy Mt. Hood Medical Center for the combined medical and surgical units are 78.5% and 69.5%. The health system goal for these immunizations is 100%. In the current immunization practice, when a patient is admitted, nurses are prompted to screen the patient, order appropriate immunizations, administer immunizations, and document historical immunizations via decision support “Best Practice Advisories” in the electronic medical record (EMR).

Purpose: Utilize a student pharmacist and existing decision support functionality to increase pneumococcal and influenza immunization rates on the medical and surgical units at Legacy Mt. Hood Medical Center to greater than 90% compliance.

Methods:
Immunization “Best Practice Advisories” were made visible and accessible to pharmacists and student pharmacists. During a 5-week internal medicine rotation, a student pharmacist utilized a report within the EMR to identify qualifying patients lacking pneumococcal and/or influenza immunization screening, vaccine orders, vaccine administration, or immunization documentation. The report directed the student to the appropriate intervention. Interventions included interviewing patients or family members, contacting providers and pharmacies to gather historical information, placing standing immunization orders, communicating with nurses to administer immunizations or discontinue duplicate orders, and documenting historical immunizations. The
student tracked the number and type of interventions made and the estimated time to complete each intervention. The primary outcome was the change from baseline (5 week period preceding the intervention) in pneumococcal and influenza immunization rates on the medical and surgical units. Other process measures include identification of the most frequent interventions made, where breakdowns in the process occur, and the average time for each intervention.

Results:
The pharmacy student made 192 interventions on 157 patients. Pre-intervention pneumococcal immunization rates were 88%, 46.5%, and 78.5% on the medical, surgical, and combined units respectively. The pneumococcal immunization rates during the intervention increased to 88.8%, 84.7%, and 87.5% respectively. Pre-intervention influenza immunization rates were 84.6%, 38.3%, and 69.5% on the medical, surgical, and combined units respectively. The influenza immunization rates during the intervention increased to 90.6%, 81.4%, and 87.3% respectively. Results to be presented include an assessment of process measures and opportunities for staff education and process improvement.

Conclusion:
Utilization of a student pharmacist and decision support tools within the EMR resulted in increased pneumococcal and influenza immunization rates on the medical and surgical units at Legacy Mt. Hood Medical Center.

ACPE #:0126-9999-13-349-L01-P

Learning Objectives:
1. Explain the impact of utilizing student pharmacists as part of the pneumococcal and influenza immunization workflow
2. Explain how decision support tools can be designed and implemented to facilitate compliance with quality measures


340 - IMPLEMENTATION OF AUTOMATION TO MANAGE CENTRALIZED CART FILL SYSTEM AND ITS IMPACT ON THE FREQUENCY OF CART FILL ERRORS
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Natasha Ly, PharmD
Hoag Memorial Hospital Presbyterian
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Presenting on Tuesday, May 14 at 5:00 PM in Palm II

Our institution’s experience in adopting a two-robot system, Swisslog PillPick and BoxPicker, to help manage a centralized cart fill system is described. The PillPick system assembles unit dose medications on PickRings for a 24-hour supply of barcoded patient-specific medications, while the BoxPicker acts as an automated pharmacy warehouse that stores and dispenses medications. This study was conducted in a 498-bed community hospital and quantifies cart fill errors before and after implementation of a two-robot system. A small component of the cart fill process still required manual filling, particularly those needing refrigeration and items not stored in the PillPick or BoxPicker. During the 90-day pre-implementation period, errors were retrospectively quantified. Following a transition period, errors were prospectively collected during the 90-day post-implementation
Period. This study will compare the frequency of cart fill medication errors and identify the types of errors encountered post-implementation. Results and conclusion of the study will be presented.

ACPE #:0126-9999-13-350-L05-P

Learning Objectives:
- State one impact of automated-medication management system on the incidence of cart fill medication errors
- List at least 2 types of reported medication errors at Hoag Hospital resulting from a manual cart fill process


341 - DETERMINING THE BEST BUSINESS MODEL FOR THE PROVISION OF MEDICATIONS TO PATIENTS OF A 340B-COVERED ENTITY
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Sae Byul Ma, PharmD
University of Southern California School of Pharmacy, Pharmacy Practice Residency-Ambulatory Care saebyulm@usc.edu

Presenting on Wednesday, May 15 at 4:30 PM in Sunset III

With over 2.7 million uninsured living in Southern California and 50,000 or more homeless in the Greater Los Angeles area, socioeconomic disparities continue to challenge the delivery of healthcare services to this high-risk population. Providing medications to these patients, almost all of whom are uninsured or underinsured, poses a challenge to these clinics with limited resources and budgetary constraints. In response to this challenge, the federal government created the Public Health Service 340B Discount Drug Pricing Program to provide outpatient medications at a reduced price to “covered entities”, including qualified safety net clinics. Clinics utilizing the 340B program are able to increase the number of patients served, reduce prescription prices, and increase clinical services as a result of cost savings. The three most common business models a safety net clinic can utilize for the 340B Discount Drug Pricing Program are an in-house pharmacy, contract pharmacy, or an in-house dispensary. The objective of this study was to identify key cost and revenue variables of each model at an urban safety net clinic with an in-house pharmacy. This analysis assisted in developing an algorithm to provide guidance to other safety net clinics on determining the best business model for delivering medication to their patients.

Data was extracted for the month of October 2012 for all encounters at an urban safety net clinic with integrated clinical pharmacy services. Pertinent patient data included demographic, insurance, and prescription information. The projected costs of operating each of the business models were calculated using the estimated costs of start-up, medications, personnel, insurance, space, dispensing fees, 340B vendor program fees, supplies and medication samples, patient assistant programs, medication donations, and volunteer labor. The projected revenue of the business models was calculated using insurance reimbursements, dispensing fees, patient payments, and reimbursements for the county uninsured program. Utilizing pertinent patient data and cost and revenue variables, an algorithm was created that may assist similar safety net clinics in determining the optimal business model for medication delivery to its patients. The results and conclusions will be presented.

ACPE #:0126-9999-13-351-L04-P
Learning Objectives:

List key variables that may affect cost and revenue for the different business models of medication delivery in safety net clinics

Describe an algorithm that will assist safety net clinics in determining the best business model for medication delivery


342 - IMPACT OF TELEPHONE VISITS ON HOSPITAL READMISSION FOR PATIENTS WITH CHF
B1. Ambulatory Care

Presented by:

Benjamin Ma, PharmD
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Presenting on Wednesday, May 15 at 5:00 PM in Sunset V

Heart failure is an epidemic public health problem in the US. Nearly 6 million Americans have heart failure, with an additional 670,000 cases diagnosed each year. Heart failure is associated with significant morbidity and mortality. Approximately 50% of patients are re-hospitalized and the overall 5-year survival remains approximately 50% for all patients with a diagnosis of heart failure. According to current practice guidelines, heart failure is managed with a combination of lifestyle modifications and drug therapy that includes angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, digoxin, aldosterone antagonists, and diuretics. Pharmacists can play a key role in reducing morbidity and mortality by ensuring that appropriate therapies are prescribed and that patients are adhering to treatment regimens.

At the Alameda County Medical Center, clinical pharmacists operate the Healthy Hearts Clinic under a collaborative agreement with hospitalists. This agreement allows qualified pharmacists to interview patients, perform medication management (including dose titration and the ability to initiate new prescription), and to provide education about CHF and medications. Over time, the providers in the clinic noticed that hospital readmissions due to CHF exacerbation are higher after holiday seasons. This could be explained by the fact that patients tend to eat and drink more at gatherings during the holidays. The resulting fluid overload can cause pulmonary congestion and peripheral edema requiring admission. In an attempt to reduce the overall 90 day readmission rate for patients seen in the Healthy Hearts clinic, phone calls were made by pharmacists and nurses in the two week period before new year to Healthy Hearts patients with EF of ≤ 35 who were admitted to the hospital in the past 6 months. Overall, 70 patients fit the criteria listed above. During the phone call, a specific set of questions were asked to identify if the patient was experiencing signs and symptoms of CHF exacerbation and require an urgent follow up appointment. At the conclusion of the call, counseling was done to reinforce the importance of limiting salt and fluid intake. In addition, all recommendations made during the phone call were documented. These patients were monitored for a period of 30 days after New Year for readmission to the hospital. The result will be compared to the number of patients admitted during the same period last year. The outcome of this study will be utilized to evaluate the implementation and impact of telephone call within the Healthy Hearts Clinic with the goal of decreasing CHF readmission rates in the future.

ACPE #:0126-9999-13-352-L01-P
Learning Objectives:
Describe the clinical benefits of having a pharmacist making phone calls to CHF patients during high risk seasons. List questions that can be asked to assess a patient’s status and an intervention that can be made to improve their clinical outcomes.


**343 - COMPARISON OF ATTAINMENT OF GLYCOSYLATED HEMOGLOBIN A1C GOALS IN HIV (+) AND HIV (-) INDIVIDUALS WITH TYPE 2 DIABETES**

A1. Infectious Disease - Anti-infective Agents

Presented by:

Ariel Ma, PharmD

VA San Diego Healthcare System

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**Presenting on Wednesday, May 15 at 10:30 AM in Dockside**

Background: Improved methods of HIV diagnosis, worldwide awareness and the emergence of highly active antiretroviral therapy have produced significant improvement in survival of HIV (+) patients. Longer lifespan, in turn, has heightened awareness of other chronic complications associated with an older HIV population such as cardiovascular diseases and diabetes. The incidence of new onset of type 2 diabetes is approximately 1-6% in HIV (+) population. Overall, the influence of HIV infection and the use of antiretroviral therapy on the risk of diabetes mellitus type II (DM II) are still poorly understood. Additionally, limited data exists on glycemic control in HIV (+) population as compared to HIV(-) individuals and factors associated with DM II in HIV(+) population require further research.

Objective: Our primary objective is to compare the attainment of Hemoglobin A1C goals (< 7%) in HIV (+) and HIV (-) patients with DM II. The second objectives are to identify possible risk factors associated with inability to achieve HbA1c goal and to compare attainment of HbA1c < 8% in HIV (+) versus HIV (-) individuals.

Method: Retrospective age-matched cohort study of patients receiving care from October 2010 to October 2012. HIV (+) patients will be age matched to HIV (-) patients in one-to-two ratio. The most recent HbA1c will be used to determine whether patients have achieved the primary outcome. Other baseline characteristics such as demographics (age, ethnicity), body mass index, selected clinical and laboratory data will be collected to measure their relationship to attaining their HbA1c goal. Chi square test will be used to compare attainment of HbA1c between the intervention and control groups. Logistic regression will be used to determine factors that were predicted of inadequate HbA1c control.

Results: Through this research, we will be able to gain a better understanding about diabetes management in HIV (+) population. Finally, it is important to know whether resource allocated to improve glycemic control in patients have been successful in HIV specialty clinic. Results and conclusions will be presented.

ACPE #:0126-9999-13-353-L02-P

Learning Objectives:

- Describe one difference between glycemic control in HIV (+) versus HIV (-) individuals.
- Identify risk factors associated with development of diabetes in the HIV (+) population.

344 - EVALUATION OF INSULIN INFUSION PROTOCOL IN THE INTENSIVE CARE UNITS
B3. Critical Care

Presented by:

Angelika Maciol, PharmD
Arrowhead Regional Medical Center
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Presenting on Wednesday, May 15 at 2:30 PM in Executive 715

Critically ill patients often experience significant insulin resistance and stress-induced hyperglycemia. In the Intensive Care Unit, hyperglycemia is caused by a variety of factors including hypermetabolic state, activation of counter-regulatory hormones and cytokine release. This can lead to increased hepatic glucose production and decreased peripheral insulin sensitivity. Furthermore, administration of dextrose-containing preparations, corticosteroids and sympathomimetic drugs can exacerbate the problem. Optimal management of hyperglycemia in the critical care setting is now advocated by a number of professional organizations since the rate of glycemic control can help improve patient outcomes.

The objective of this retrospective chart review is to evaluate the use of the insulin infusion protocol in the intensive care units by determining the time needed to achieve the target blood glucose range, the time within the goal range and the number of hyperglycemic and hypoglycemic measurements while receiving the insulin drip. These findings will be reviewed in the context of pre-existing diabetes and the presence of diabetic ketoacidosis (DKA). The effect of corticosteroid and sympathomimetic drug administration on glycemic control and effectiveness of the insulin infusion will be examined.

ACPE #:0126-9999-13-354-L01-P
Learning Objectives:
- Identify the causes of hyperglycemia in the critically ill population.
- Explain the risks of hyperglycemia and hypoglycemia in the critically ill patients.


345 - EVALUATING TWO PROTEASE INHIBITORS FOR THE TREATMENT OF HEPATITIS C IN A MANAGED CARE SETTING
E1. Managed Care

Presented by:

Judy Mai, PharmD
Blue Shield of California Managed Care Pharmacy Residency Program
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Presenting on Wednesday, May 15 at 4:30 PM in Sunset II

It is estimated that approximately 17,000 Americans become infected with hepatitis C each year, with a current prevalence of 3.2 million. According to the American Association for the Study of Liver Diseases practice guidelines, optimal therapy for chronic hepatitis C (genotype 1) infection includes a direct-acting antiviral (DAA)
protease inhibitor in combination with peginterferon alfa and ribavirin. Currently, there are two oral protease inhibitors available: telaprevir and boceprevir. While both agents have demonstrated improved sustained virological response in clinical studies, there are limited data comparing the two protease inhibitors outside of a clinical trial setting.

A comparative retrospective, observational analysis using pharmacy and medical claims data from a California health plan will be conducted to evaluate telaprevir and boceprevir in combination with peginterferon alfa and ribavirin. The analysis will include members who have a diagnosis of chronic hepatitis C (genotype 1) infection with detectable HCV-RNA and started telaprevir or boceprevir between July 2011 and December 2011. The purpose of this study is to evaluate medication adherence and clinical health outcomes for telaprevir and boceprevir containing regimen. Study objectives will be assessed for members with continuous pharmacy eligibility during the evaluation period. Result and conclusion are to be presented.

ACPE #:0126-9999-13-355-L01-P
Learning Objectives:
   - Describe medication adherence for triple therapy regimen containing either telaprevir or boceprevir.
   - Describe pharmacy and medical utilization for Hepatitis C treatment from a managed care perspective.


346 - A RETROSPECTIVE STUDY OF A COLLABORATIVE GROUP SMOKING CESSATION PROGRAM AT VIRGINIA GARCIA MEMORIAL HEALTH CENTER
B1. Ambulatory Care

Presented by:

Kristen Malabanan, PharmD
Pacific University Academic Fellowship
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Presenting on Wednesday, May 15 at 8:00 AM in Bay View

Virginia Garcia Memorial Health Center (VGMHC) is a community health center that provides healthcare services to migrant farmers and low income or uninsured populations. Currently, individual patient smoking cessation services are provided by the behavioral health providers. VGMHC utilizes group classes for their diabetes program and would like to pursue another methodology in assisting patients with smoking cessation. The purpose of this project is to determine if an integrated group smoking cessation program provided by pharmacists and behavioral health providers is useful for patients at VGMHC – Hillsboro through surveying patient perceptions of the program and how it impacts patient confidence levels regarding smoking cessation. VGMHC – Hillsboro patients who use tobacco products, who are non-pregnant, greater than 18 years of age, and speak English, are eligible and invited to participate in the group smoking cessation program. The program includes eight smoking cessation classes beginning February 28, 2013 through April 19, 2013. The first smoking cessation class includes orientation to the course and patient background information. Treatment plans and goals are provided in the second class session. Subsequent classes address patient adherence, smoking cessation education reinforcement and medication monitoring as needed. Questionnaires, created by the principle investigator, are administered at the first class, midpoint and final group session. Survey questions gather information on tobacco use, confidence and importance of quitting tobacco, demographics, and opinions of the collaborative group smoking cessation program. To maintain confidentiality, survey respondents are not
identified directly, but data is collected and reported as an aggregate. Inferential and descriptive statistics are used as appropriate. Results and conclusions will be presented and discussed.

ACPE #:0126-9999-13-356-L01-P
Learning Objectives:
1. Describe the patients’ confidence and importance of smoking cessation from Virginia Garcia Memorial Health Center’s collaborative group smoking cessation program.
2. Compare the patients’ tobacco use from the first class session and last class session at VGMHC’s collaborative group smoking cessation program.


347 - EVALUATING EFFICACY OF ANTIMICROBIAL LADEN BONE CEMENT IN PRIMARY TOTAL KNEE ARTHROPLASTY BASED ON PATIENT RISK FACTORS
A1. Infectious Disease - Anti-infective Agents

Presented by:
Kevin Malina, PharmD
Scottsdale Healthcare
kmalina@shc.org

Presenting on Wednesday, May 15 at 11:00 AM in Dockside

Background: Commercially-made bone cement is used for prosthesis fixation to bones during joint arthroplasty procedures. Currently, there are several antibiotic-impregnated bone cement products on the market which are FDA-approved for use in the second stage of a two-stage joint revision due to infection. There is currently no FDA approval for use of these products in primary joint procedures. At Scottsdale Healthcare (SHC) antibiotic-impregnated cement is often utilized off-label during primary joint arthroplasty in the hopes of preventing infection and the need for future revision. There is conflicting evidence regarding the effectiveness and safety in these patients.

Objectives: The purpose of this study was to evaluate the rates of post-op infections and revisions in total knee arthroplasty based on use of antimicrobial bone cement. Additionally, the impact of patient risk factors on post-op arthroplasty infections was assessed.

Methods: Total knee arthroplasties occurring during the year 2011 at Scottsdale Healthcare were retrospectively evaluated for rates of infection. Cases in which antimicrobial bone cement was used were compared to those not employing such strategy. The rates of infection in total knee arthroplasties with or without antimicrobial bone cement were evaluated. The following data was collected: primary or revision of joint, age, gender, pre-operative antibiotic timing and dose, end anesthesia time, timing of last prophylactic antibiotic, length of treatment, and post-operative infection. Additionally, the number of patients who meet criteria to be considered at high-risk for infection post-procedure were determined. Subsequently, data used to determine risk for infection was collected and included the following: immunocompromised, prior infection of the same joint, age greater than 75 years old, revision of same joint. Immunocompromise was defined as the presence of: rheumatoid arthritis, systemic lupus erythematosus, chronic steroid use, diabetes mellitus, organ transplantation, chemotherapy, human immunodeficiency virus, or hemophilia. A secondary analysis was done to see if rate of infection varies between the treatment groups for high-risk patients.

Results and Conclusions: To be presented at 2013 Western States Residency Conference.
Learning Objectives:
- Describe the commercially available bone cement products and methods utilized in compounding antimicrobial bone cement.
- Identify types of patients that may benefit from use of antimicrobial bone cement during joint arthroplasty.


348 - ANTIMICROBIAL SUSCEPTIBILITY OF INVASIVE S. PNEUMONIAE ISOLATED FROM PERSONS WITH COMMUNITY-ACQUIRED PNEUMONIA
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 11:30 AM in Dockside

Introduction
Streptococcus pneumoniae (SP) is the leading cause of community-acquired pneumonia (CAP), which is the most common manifestation of invasive pneumococcal disease (IPD). Empiric treatment of CAP can be ineffective or select for antimicrobial resistance if non-susceptible antibiotics are used. CDC conducts laboratory-based surveillance for IPD in Alaska. We used CDC’s IPD surveillance data to describe antimicrobial susceptibility in pneumococcal CAP isolates.

Methods
We identified adults aged >18 years with IPD, defined as having a culture confirmed SP isolate from a normally sterile site, during 1992–2011. We defined a case of invasive pneumococcal CAP (IP-CAP) as a person with IPD who had a diagnosis of pneumonia recorded in their medical record and neither resided in a nursing home or hospital, nor had >2 days of hospitalization prior to diagnosis. Starting in 1999, persons with >1 of 22 predisposing conditions for developing pneumonia were defined as having a comorbid condition. We calculated rates of IP-CAP and described IP-CAP isolates susceptibility to penicillin, ceftriaxone, tetracycline, levofloxacin, and macrolides by demographic and clinical characteristics.

Results
Among the 1,711 IPD cases identified, 1,238 (72%) had CAP (rate [range]/100,000/year: 13.6 [9.4–18.7]); in 1207 (97%) of IP-CAP cases, SP was isolated from the blood. There were 350 IP-CAP cases in rural settings (rate: 13/100,000/year) compared with 888 in urban settings (rate: 14/100,000/year). Of the 864 IP-CAP cases occurring after 1999, 758 (88%) had >1 comorbid condition. A majority, 1,114 IP-CAP cases (91%), required hospitalization for treatment. During the study period, isolates susceptibility to penicillin, ceftriaxone, tetracycline, levofloxacin, and erythromycin was 88%, 97%, 96%, 100%, and 91%, respectively. Isolates from urban residents were less susceptible to erythromycin than isolates from rural residents (90% versus 93%, p = 0.03), and isolates from persons with >1 comorbid condition were less susceptible to penicillin compared to isolates from persons without any comorbid conditions (85% versus 94%, p < 0.01). Otherwise, there were no significant differences in isolates’ susceptibility for the 5 antibiotics with regards to the geography (urban versus rural), presence of comorbid conditions, or treatment setting (inpatient versus outpatient).

Conclusions
Among the empiric antimicrobials recommended by the 2007 Infectious Diseases Society of America/American Thoracic Society guidelines on the management of CAP, IPD isolates from adults in Alaska with CAP were most susceptible to fluoroquinolones, regardless of geographic or treatment setting, followed by third-generation cephalosporins and tetracyclines.

ACPE #:0126-9999-13-358-L01-P
Learning Objectives:
- Describe patterns of antimicrobial susceptibility of invasive pneumococcal disease isolated from persons with community-acquired pneumonia in Alaska.
- List the antimicrobials to which invasive pneumococcal disease isolates from adults in Alaska with community-acquired pneumonia were most susceptible.


349 - EVALUATION OF COLON CANCER TREATMENT ADHERENCE TO NCCN GUIDELINES
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Julia Marie, PharmD
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Presenting on Tuesday, May 14 at 4:00 PM in Sunset I

Utilization of evidence-based treatment pathways for oncology therapy ensures patients receive a high standard of care. By proactively evaluating practices, cancer treatment centers can stay current with evolving practice recommendations and provide evidence based documentation to support reimbursement by insurance companies. Retrospective data was collected for patients 18 years and older treated for new diagnoses of colon cancer between January and October of 2012. The primary outcome evaluated was the percentage of patients treated in accordance with current NCCN colon cancer guidelines. Secondary outcomes evaluated included patient outcomes and CEA marker reduction. Exclusion criteria are stage 1 and stage 2 cases, enrollment in a research study, and intentional withdrawal from medical intervention due to patient preference. This project is exempt from Institutional Review Board approval as it was deemed a performance improvement initiative. Results and conclusion will be discussed.

ACPE #:0126-9999-13-359-L01-P
Learning Objectives:
- Describe the role of evidence-based guidelines in oncology treatment practices.
- Explain rationale for utilizing pathway-based therapeutic regimens to support congruency amongst providers.

350 - THE EFFECTS OF SIROLIMUS ON RENAL FUNCTION AND CHRONIC REJECTION IN LUNG TRANSPLANT RECIPIENTS: A SINGLE-CENTER, RETROSPECTIVE REVIEW

B4. General Clinical Practice

Presented by:

Mark Mariski, PharmD
University of California San Diego Health System Solid Organ Transplant
mmariski@ucsd.edu

Presenting on Wednesday, May 15 at 11:00 AM in Royal II

Introduction: Sirolimus, an inhibitor of the mammalian target of rapamycin (mTOR), has been shown to be effective in preventing rejection after solid organ transplantation. Currently, it is only FDA approved in renal transplant, but it has also been studied in cardiac and liver transplant. There is limited data on the use of sirolimus in lung transplantation. After lung transplant, two common complications are the development of renal impairment and chronic rejection or bronchiolitis obliterans syndrome (BOS). Two proposed advantages of using sirolimus in lung transplant are: 1) to replace or limit CNI exposure, thus avoiding CNI nephrotoxicity and 2) to prevent or slow the progression of BOS. Despite these proposed benefits, the use of sirolimus has been limited due to a black box warning contraindicating its use in lung transplant because of wound healing complications observed soon after transplant. This study serves to evaluate the effect on renal function and the development of chronic rejection in lung transplant recipients initiated on sirolimus.

Methodology: This is a retrospective study of patients who have undergone lung transplantation at UC San Diego Health System from June 2003 to April 2012. In order to determine the effect of sirolimus on renal function, the serum creatinine prior to conversion from a CNI to sirolimus will be compared to the serum creatinine at 3, 12, and 36 months post-conversion. To investigate its effects on BOS and pulmonary function, FEV1 measurements will be collected pre-conversion and at 1 and 3 years post-conversion. Data regarding immunosuppression regimens, including CNI and sirolimus drug levels will also be collected. To characterize adverse effects, the reason for sirolimus discontinuation will be collected.

Results and Conclusions: Data collection and analysis is ongoing and will be presented.

ACPE #:0126-9999-13-360-L01-P
Learning Objectives:

- Explain the proposed risks and benefits of using sirolimus in lung transplant.
- Describe the effects of sirolimus on renal function and progression/incidence of BOS after lung transplant.


351 - DEVELOPMENT OF A PHARMACY INVENTORY MANAGEMENT PROCESS

C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Ryan Markham, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Palm II

Introduction:
Medication-related expenditures are a frequent target for optimization due to their large influence on the pharmacy budget. When evaluating cost-containment strategies, the American Society of Health-System Pharmacists recommends that purchasing and inventory management are the first aspects considered. At Oregon Health & Science University, a 572-bed academic medical center in Portland, Oregon, the inpatient pharmacy transitioned into a new physical space in 2011 and installed a computer-based inventory system that manages inventory areas including two dispensing carousels. Since that time, a systematic approach to inventory management incorporating the new technology has not been developed. The objective of this project is to develop a process to manage pharmacy inventory with the intention of reducing costs and increasing efficiency.

Methodology:
One year of dispensing history from the computer-monitored inventory areas and the inpatient pharmacy’s purchase history were analyzed to identify target medications. The project team worked with the vendor for the computer-based inventory system to develop a report that included a custom field to designate inventory categories to assist in the ongoing analysis and management. Descriptive medication inventory categories were defined through the project based on several analyses. The purchase history was sorted by medication in descending order of total purchases. The medications that comprised 80% of cumulative purchases were designated category “A.” Similarly, the dispensing history was sorted in descending order of total dispensed doses. The top 100 medications were designated category “B.”

A weighted daily usage was calculated for each medication based on utilization in three preceding time intervals (7, 30 and 90 days). Each time interval was assigned a percent contribution to arrive at this weighted daily usage (20%, 30% and 50% respectively). Inventory levels for included medications were calculated based on this weighted daily usage and a pre-determined minimum and maximum day supply (5 and 7 days respectively). Maximum inventory levels were rounded up to the next complete package size. Where these calculations resulted in a lower proposed minimum inventory level, pharmacists with experience in the therapeutic use of the medication were consulted to provide recommendations based on a typical course of therapy. If revised, these medications had their category appended with a “T.” The unit cost for each medication was collected to determine the financial impact of the new inventory levels. The target metrics that will be used to determine the impact of this analysis and process change include the cost of inventory levels, frequency of medication stockouts and inventory turns.

Results and conclusions will be presented

ACPE #:0126-9999-13-361-L04-P

Learning Objectives:
- Explain a method of identifying high cost and high volume medications which merit focused inventory management efforts
- Describe a novel use of technology to categorize medications and assist in inventory management


352 - EVALUATION OF TARGET PEAK ANTI-FACTOR XA LEVELS IN OBESE PATIENTS RECEIVING ENOXAPARIN PROPHYLAXIS

B7. Pharmacokinetics
Introduction: Obesity is an independent risk factor for venous thromboembolism (VTE) and research indicates there is a negative correlation between body weight and Anti-Factor Xa (AFXa) levels in patients treated with prophylactic enoxaparin. In addition, a meta-analysis of nine studies including patients with a BMI ≥ 30 kg/m² found that the risk of VTE was more than doubled in obese patients. Currently, the 2012 American College of Chest Physicians (ACCP) guidelines does not clearly define prophylactic enoxaparin dosing in obese patients. The ACCP guidelines recommend monitoring peak AFXa levels (4 hours post dose) in certain patient populations such as obesity, pediatrics, elderly, severe renal impairment, and pregnancy. The target peak AFXa levels for prophylaxis is 0.2 – 0.5 IU/mL. The optimal starting dose of prophylactic enoxaparin and titration based on AFXa levels is currently unknown. It is crucial to develop clear standards for enoxaparin dosing in obese patients because VTE leads to significant morbidity and mortality.

Methodology: This is a retrospective chart review of obese patients who received prophylactic doses of enoxaparin at the University of California, San Diego Health System (UCSDHS) from February 1st 2011 through August 31st 2012. The study will include patients who meet the following inclusion criteria: adult patients age ≥18 years, BMI ≥ 30 kg/m², enoxaparin for ≥ 48 hours, and at least one AFXa peak level measured 3-5 hours after at least the 3rd consecutive and equivalent enoxaparin dose. Patients were excluded for: pregnancy, creatinine clearance <15 mL/min as calculated by Cockcroft & Gault, dialysis, incorrectly timed AFXa levels, enoxaparin for prevention of embolic stroke due to atrial fibrillation, known factor deficiency, history of heparin induced thrombocytopenia (HIT), platelets <50,000, end-stage liver disease defined as Child-Pugh Score C, and known hypercoaguable state. The primary end point is to evaluate the number of patients who achieved target peak AFXa levels on standard doses of prophylactic enoxaparin. Secondary endpoints include rates of major bleeding and occurrence of VTE during the current hospital admission. The data from this study will be analyzed using appropriate descriptive statistics.

Results & Conclusions: Will be presented upon completion of data collection and analysis.

References:

ACPE #:0126-9999-13-362-L01-P
Learning Objectives:
- Describe the number of obese patients (defined as BMI ≥ 30 kg/m²) who achieve target peak AFXa levels on standard prophylactic (30 mg BID or 40 mg daily) doses of enoxaparin.
- Describe the safety and efficacy of current enoxaparin dosing practices in obese patients at UCSDHS.

353 - RELATIONSHIP BETWEEN STATINS, CHOLESTEROL LEVELS, AND CATARACTS IN THE VETERAN POPULATION
B4. General Clinical Practice

Presented by:

Jeffrey Martindale, PharmD
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Presenting on Wednesday, May 15 at 10:30 AM in Royal II

Previous medical literature has suggested a link between statin therapy for cholesterol management and the development of age-related cataracts. The objective of this study is to retrospectively analyze patients diagnosed with age-related cataracts to determine if exposure to statins as well as the degree of cholesterol lowering is a risk factor for early cataract development. Patients with a diagnosis of senile (age-related) cataract, other cataract, or unspecified cataract, who were seen in the eye clinics within the VA Northern California Health Care System were included in the analysis for this study. Patients were grouped by prior statin use or no statin use and the average age at cataract diagnosis was compared. Average lipid values for low-density lipoprotein, total cholesterol, high-density lipoprotein, and triglycerides were calculated from all available fasting lipid profiles from the date of diagnosis back to the earliest measured lipid profile. Predefined lipid cutoff points were used per ATP III guidelines to group patients. The average age at cataract diagnosis was calculated for each group and compared for statistical differences. Results and conclusions will be presented.

ACPE #:0126-9999-13-363-L01-P
Learning Objectives:
- Describe the proposed mechanism by which statins may contribute to cataract formation.
- List other known risk factors for cataract development.


354 - EVALUATION OF MEDICATION RECONCILIATION UPON ADMISSION TO A CHILDREN’S HOSPITAL
D1. Medication Safety

Presented by:

Nicole Martinez, PharmD
Children's Hospital Central California
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Presenting on Wednesday, May 15 at 8:00 AM in Palm I

Medication reconciliation is intended to be a systematic extension of a patient’s medication history. It is a process in which the most accurate list of all medications the patient is taking, including herbal remedies, vitamins, and over the counter medications, is clinically evaluated. It was developed to ensure medications were not added, omitted or changed inadvertently during transitions in care. Studies show that discrepancies in
patients’ medications can occur frequently and have a negative impact on safety such that inadequate medication reconciliation can account for 46% of all medication errors, and up to 20% of adverse drug events among hospitalized patients. The pediatric patient population introduces more complexity into medication regimens as dosing is often based on weight which can change rapidly. In addition, standard manufactured medications in adult concentrations need additional manipulation for pediatric use making this population more vulnerable to medication reconciliation errors. The inability to communicate medication adverse effects is another challenge identified in the pediatric population. Other studies have shown that pediatric patients with medically complex conditions, greater than 2 transitions in care, and dosing more frequent than every 12 hours experience more discrepancies upon admission and transitions in care. The Joint Commission recognizes the importance—and complexity—of an accurate medication history and has established medication reconciliation as a National Patient Safety Goal. It has also been documented that pharmacist-operated medication reconciliation is considered the “gold standard” and can decrease medication errors that occur during transitions in care. Therefore, the goal of our study is to evaluate the Children’s Hospital Central California current medication reconciliation process performed by non-pharmacists and explore the effects of pharmacist-run medication reconciliation on the number and type of discrepancies. Methods: This prospective, longitudinal study includes 200 pediatric patients and was conducted at Children’s Hospital Central California. A pharmacist-run medication reconciliation interview was conducted using a preset list of questions. After the interview was complete, these data was then compared against the hospital’s Ambulatory Order Management (AOM) list. The medication history attained from the medication reconciliation interview and AOM was finally compared against the inpatient medication list and physicians were contacted on any discrepancies found. Discrepancies included omissions, additions, or changes from home medication drug, dose, route, or frequency. Statistical Analysis: Chi Squared and ANOVA tests will be utilized to detect statistical differences, alpha = 0.05. Results and Conclusion: The results of pharmacist-collected medication histories compared to non-pharmacist collected histories will be compared and analyzed. Discrepancy types will include omissions, additions, or changes from home medication drug, dose, route, or frequency. Results and conclusion will be presented.

ACPE #:0126-9999-13-364-L05-P
Learning Objectives:
- Describe the current medication reconciliation process at CHCC.
- Describe the type of discrepancies found upon pharmacist-run medication reconciliation.


355 - RETROSPECTIVE REVIEW OF ADHERENCE TO EVIDENCE-BASED EMPIRIC ANTIBIOTIC THERAPY IN A COUNTY EMERGENCY DEPARTMENT
A1. Infectious Disease - Anti-infective Agents

Presented by:

Richard Martinez, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Dockside

Background
At present, emergency department (ED) pharmacist services are offered by a limited number of hospitals nationwide, with estimates ranging from 3% to 6.8%. The National Centers for Health Statistics recently
estimated that nearly 120 million ED visits occur in the United States each year. In addition, medication administration or prescribing accounts for over 75% of ED visits, which translates into 210 million medication encounters. The chaotic nature of the ED creates an environment prone to rapid drug selection and medication errors. A recently published observational study in 4 academic institutions showed that recovered medication errors (intercepted before reaching the patient) were most commonly associated with antimicrobials, central nervous system drugs, and anticoagulants/thrombolytic agents. To date, published reports of ED pharmacist interventions have not focused on adherence to evidence-based guidelines for multiple infectious diseases. Pharmacists do not yet provide order review and clinical services in the ED at Santa Clara Valley Medical Center (SCVMC), a 524 bed teaching hospital and the second largest county institution in the state of California. Emergency room visits account for approximately 4000 adult and pediatric outpatient visits per month at our institution.

Objectives
The main objective is to examine adherence rates of empiric antibiotic therapy to evidence-based guidelines in patients who presented to the ED at SCVMC. The secondary objective of this study includes cost avoidance associated with antibiotic formulary adherence.

Methodology
This investigation is a retrospective chart review of adult patients (18 years and older) who were admitted to the ED between June 2012 to December 2012. Patients who require antibiotic therapy for the following infectious diseases will be reviewed: community acquired pneumonia, hospital acquired pneumonia, diabetic foot cellulitis, complicated and uncomplicated urinary tract infection, simple cellulitis, and diverticulitis. Exclusion criteria include patients who did not require antibiotics for the diagnoses listed above. The empiric antibiotic dosing guideline approved by the SCVMC anti-infective evaluation subcommittee will be used to determine appropriateness of antibiotic selection. The Fisher’s exact test or chi-square analysis will be used for comparisons between groups, where appropriate. To determine significant differences in adherence to evidence-based guidelines for infectious diseases, a p value below 0.05 will be required.

This study remains under investigation and final outcomes have not yet been determined. Any available results will be presented.

ACPE #:0126-9999-13-365-L01-P

Learning Objectives:
- Identify opportunities for improved empiric antibiotic selection in the emergency department.
- List cost-avoidance strategies associated with antibiotic formulary adherence in the emergency department.


356 - SUSTAINED VIROLOGIC RESPONSE AND ADHERENCE RATES IN HEPATITIS C GENOTYPE 1 PATIENTS TREATED WITH PROTEASE INHIBITORS

A1. Infectious Disease - Anti-infective Agents

Presented by:

Anthony May, PharmD
SelectHealth
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Presenting on Wednesday, May 15 at 1:30 PM in Dockside
Background:
Two new protease inhibitors (PI), Incivek (telaprevir) and Victrelis (boceprevir), were recently approved for the treatment of Hepatitis C Virus (HCV) genotype 1 infections in adult patients. While these drugs demonstrated efficacy in clinical trials, their side effect profiles and complex dosing schedules raise concerns about compliance and efficacy in a real world population.

Objectives:
The primary objective of this study is to compare sustained virologic response (SVR) rates among a population of commercially insured members treated with either Incivek or Victrelis to SVR rates published in previous clinical trials. Secondary objectives include calculation of adherence rates and evaluation of reasons for treatment discontinuation.

Methodology:
Study methods and protocols were approved by the Institutional Review Board. Prior authorization (PA) forms for Incivek and Victrelis will be used to identify members meeting the following criteria: eligible for prescription drug coverage, ≥ 18 years of age, at least one prescription fill for either Incivek or Victrelis between May 1, 2011 and December 31, 2012, and continuous enrollment in a SelectHealth plan for ≥ 12 months. Members with claims for Incivek or Victrelis without subsequent Peg-interferon and ribavirin claims will be excluded. Data on previous treatments, viral loads prior to and during treatment and expected treatment durations will be obtained from PA forms and used to assess SVR rates. Baseline member characteristics will be analyzed using mean and standard deviation measurements. If applicable, adherence rates will be determined using the medication possession ratio (MPR). A Fisher’s-exact test will be used to determine differences in adherence rates between previously treated and treatment-naïve members. A patient will be said to have discontinued treatment if treatment discontinuation is specifically stated in his/her medical record. Due to the limited sample size, analysis of SVR rates will consider all patients, including those who are less than 80% adherent to PI therapy. SVR will be defined as a continued, undetectable, HCV viral load, 24 weeks after completion of therapy with Peg-interferon, ribavirin, and either Incivek or Victrelis. SVR at week 12 and eRVR (HCV RNA reduction of 99% or more after 12 weeks of treatment) will also be assessed.

ACPE #: 0126-9999-13-366-L01-P

Learning Objectives:
- Describe the difference in sustained virologic response rates among members enrolled in a commercial health plan with those seen in clinical trials.
- List the most common side effects associated with hepatitis C therapies and describe their management.


357 - EFFICACY AND SAFETY OF A NURSING-DRIVEN CONTINUOUS INSULIN INFUSION PROTOCOL AT AN ACADEMIC MEDICAL CENTER
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:
Scott Mayeda, PharmD
Stanford Hospital & Clinics PGY1 Pharmacy Practice Residency
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Presenting on Tuesday, May 14 at 5:00 PM in Mission Bay Foyer

Introduction:
Glycemic control is a frequent problem for acutely ill patients due to stress response, medications, and variable sources of nutrition. Using intensive insulin therapy to correct hyperglycemia in critically ill patients has been shown to decrease morbidity and mortality. Multiple studies have demonstrated the utility of insulin infusion protocols in the management of hyperglycemia. However, development of the insulin infusion protocol must take into consideration the higher risk of mortality associated with moderate to severe hypoglycemia in ICU patients.

Stanford Hospital & Clinics recently revised the standard continuous insulin infusion protocol in an effort to improve glycemic control during a patient’s stay. One notable change is that the new protocol removes the administration of intravenous insulin boluses when a patient is hyperglycemic. The protocol provides nursing staff detailed instructions for blood glucose monitoring and insulin infusion rate adjustments, requiring minimal physician input. The revised protocol is not used for patients with diabetic ketoacidosis or hyperosmolar hyperglycemic states as there are separate infusion protocols for those patient populations.

After performing a literature review, little data was found in regards to an institution transitioning to a different insulin infusion protocol. The investigators hope to learn whether or not removing insulin boluses would lower the rates of hypoglycemia and increase the amount of time within goal blood glucose range.

Methodology:
The primary objective of this study is to determine if the new continuous insulin infusion protocol improved glycemic control at our institution. This retrospective study will gather data on adult patients started on the revised insulin infusion protocol to compare with adult patients who received the previous insulin infusion protocol. Outcomes measured will include rate of hyperglycemia, rate of hypoglycemia, and time within blood glucose goal range. This study was approved by the Stanford University Institutional Review Board.

Results & Conclusions:
Study data and findings will be presented in May 2013.

ACPE #:0126-9999-13-367-L01-P
Learning Objectives:
- Explain the importance and benefits of glycemic control in critically ill patients found in the literature.
- Describe the efficacy data behind the use of insulin infusion protocols.


358 - DECREASING ALERT FATIGUE WITH AN ALTERNATIVE ALERT SYSTEM FOR DRUG INTERACTIONS IN AN ELECTRONIC HEALTH RECORD
D1. Medication Safety

Presented by:
Jamie Mazon, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Palm I

Introduction:
Computerized order entry uses decision support systems to reduce medication errors by providing warnings of drug-drug interactions. However, the large number of warnings that pop-up contribute to alert fatigue, leading providers and pharmacists to ignore vital alerts. Currently, the majority of drug warnings do not add value in
Methodology:
Baseline measures of all drug-drug interactions and prescribing habits concerning overridden, reviewed, and removed rates were acquired from our electronic health record. Drug warnings from this analysis were then reviewed for their clinical significance, with a large number of drug interactions found related to warfarin. Due to this, warfarin interactions were singled out for a trial. An alternative alert system, known as a “Best Practice Alert” (BPA), was designed to highlight the clinically significant drug interactions. The BPA would be reviewed by pharmacists and physicians on the specific content presented in the BPA. Education will then be provided to the pharmacists, physicians, and nursing staff of changes to the medication alert system and how to properly interpret the new warnings. The finalized BPA will then be presented to the Pharmacy and Therapeutics Committee for approval to turn off non-clinically relevant drug alerts and replace clinically relevant ones with the BPA. A repeat analysis would then be reviewed to determine effects of the alternative reporting system. Future directions of this project include expanding the BPA to other drug-drug interactions in addition to warfarin and formation of a clinical decision support (CDS) charter for the hospital.
Results and conclusions will be discussed.

Learning Objectives:
- Identify common medication warnings that contribute to alert fatigue.
- Employ strategies to reduce alerts in an electronic health record


359 - COMPARISON OF INR CONTROL WITH WARFARIN ACROSS THE CONTINUUM OF CARE BEFORE AND AFTER THE IMPLEMENTATION OF COMPUTERIZED PRESCRIBER ORDER ENTRY (CPOE)

D1. Medication Safety

Presented by:
Caitlin McBee, PharmD
Scottsdale Healthcare
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Presenting on Wednesday, May 15 at 9:00 AM in Palm I

Introduction: The Leapfrog Group has set standards for hospital practice in areas such as anticoagulation, and uses these standards to publicly compare hospital safety and quality across the nation. This study will help to determine how the implementation of computerized prescriber order entry (CPOE) and the use of electronic order forms will improve warfarin usage through transitions of care at Scottsdale Healthcare, allowing Scottsdale to further meet the national standards for hospital anticoagulation practices.

Methods: The research proposal was approved by the International Review Board (IRB) prior to study initiation. A Failure Modes and Effects Analysis (FMEA) was completed to identify areas in the warfarin usage process at risk for adverse outcomes. This information was utilized to build an order set for electronic prescribing of warfarin with the implementation of Computerized Prescriber Order Entry (CPOE) at Scottsdale Healthcare. For the purposes of this study, a retrospective analysis of patients on warfarin will be performed for patients admitted before and after the use of this electronic ordering form (iform). Patients 18-75 years old will be
included if they have received two or more doses of warfarin as inpatients at any of the three Scottsdale Healthcare hospitals. Patients will be followed for their entire length of stay, within and across hospital boundaries. Collected data will include: age, gender, (International Normalized ratio) INR values, warfarin dose, indication and target INR range, and pertinent medications or co-morbidities with potential to influence INR. If the target INR range is not noted, the 2012 CHEST guidelines recommendation for the specific indication will be used. All information will be kept confidentially. INR control will be used as a marker of safe and efficacious warfarin usage. Daily INR, number of days with INR greater than 4, and days without INR drawn will be compared between the groups. The patients with INR greater than 4 will be assessed for precipitating factors. Patients with subtherapeutic INR’s will be assessed for appropriateness of therapy according to the CHEST guidelines. The researchers will assess compliance with guidelines and standards such as those set by The Leapfrog Group, and examine the process of warfarin usage for future improvement initiatives.

ACPE #:0126-9999-13-369-L01-P
Learning Objectives:

1. List factors in the warfarin usage process with the potential to cause adverse outcomes and revise processes to increase patient safety.
2. Explain the benefits of implementing an electronic order set for warfarin in computerized physician order entry (CPOE) technology.


**360 - OPPORTUNITIES TO IMPROVE MEDICATION MANAGEMENT IN POST BARIATRIC SURGERY PATIENTS**

A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

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**Presenting on Tuesday, May 14 at 11:00 AM in Mission Bay Foyer**

There is a paucity of literature on medication use in the post bariatric surgery patient population, yet there is a tremendous need to optimize the medication regimens in these patients in order to achieve improved health outcomes. The anatomical changes that result from bariatric surgery, alterations in patients’ medication needs, changes in absorption, and tolerability often necessitate intervention. The objective of this study is to demonstrate the value of a pharmacist’s recommendations to improve medication management in post bariatric surgery patients. The project is a single-center, prospective, observational study evaluating the impact of pharmacist interventions on post bariatric surgery patients’ medication regimens.

In the pre- and post-operative period, patients’ medications were evaluated by a pharmacist and recommendations were made to physicians for optimization of the patients’ medication regimen. The primary endpoints are the number of interventions, types of interventions, and physicians’ acceptance rate on pharmacists’ medication recommendations. Patients were counseled at bedside post-operatively reinforcing post-op bariatric surgery medication principles and ensuring patients comprehended their medication regimens. A pamphlet reinforcing bariatric surgery medication principles was developed to be included in the patients’
pre-operative information binder. Each patient also received post-discharge follow-up to assess for medication adherence and literacy.
Results and conclusions will be presented.

ACPE #:0126-9999-13-370-L01-P
Learning Objectives:
- Describe the effects of pharmacist bedside education on medication literacy and adherence of post bariatric surgery patients.
- Describe the types of interventions in which a pharmacist can improve medication regimens in post bariatric surgery patients.


361 - COMPARING PEAK TOBRAMYCIN CONCENTRATIONS WITH ONCE-DAILY DOSING IN CYSTIC FIBROSIS PATIENTS: DEFINING PATIENT PARAMETERS
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 2:00 PM in Dockside

Introduction
Dosing of aminoglycosides is a clinical expectation of pharmacists at the University of Colorado Hospital (UCH). Currently, in cystic fibrosis (CF) patients at UCH, tobramycin dosing with defined serum concentration dosing targets remains non-standardized.
This study will be conducted to examine differences in safety and efficacy of tobramycin dosing by comparing serum peak concentrations in once-daily dosing regimens used in CF adults at UCH. The study also will also define CF patient-specific parameters at UCH to be used in the development and implementation of a tobramycin dosing nomogram for this patient population.

Methodology
All patients between the ages of 18 and 55 years of age admitted to UCH between September 2011, and December 2012, for a CF-related infectious exacerbation treated with tobramycin and able to participate in pulmonary-function tests were included in the study. The primary outcome measures are changes in Forced Expiratory Volume at one second (FEV1) during hospital course, time to readmission, and the percent change in serum creatinine. Secondary outcomes to be observed are the following patient parameters to be used in the development of a tobramycin dosing nomogram at UCH: age, height, weight, minimum inhibitory concentration (MIC) of Pseudomonas aeruginosa, creatinine clearance, tobramycin volume of distribution, elimination rate constant, half-life, and time of serum tobramycin concentration below the MIC of Pseudomonas aeruginosa.

Results
Patient outcomes are under investigation, with data collection and analysis currently being conducted.

Conclusions
Conclusions are pending based on results of data analysis.

ACPE #:0126-9999-13-371-L01-P
Learning Objectives:
Explain the impact of tobramycin serum peak concentrations in the treatment and improvement of cystic fibrosis infectious exacerbations
Identify patient pharmacokinetic parameters unique to the University of Colorado Hospital cystic fibrosis patient population for the development and implementation of a once-daily dosing tobramycin nomogram


362 - STUDENT PHARMACIST KNOWLEDGE OF CURRENT AND EVOLVING PHARMACY PRACTICE AND PERCEPTION OF COMMUNITY RESIDENCY PROGRAMS

B2. Community Practice

Presented by:
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Presenting on Tuesday, May 14 at 2:00 PM in Sunset V

Introduction: The pharmacist’s role in community, primary care, and specialty settings has continued to evolve. Our nation’s healthcare needs are changing under the soon-to-be implemented Affordable Care Act, which emphasizes patient access to care, quality of care, and cost savings to the health care system. Given pharmacists’ accessibility, training, expertise, cost-effectiveness, and positive quality outcomes, pharmacists will likely have a growing number of opportunities to provide clinical services beyond dispensing. Upon graduation, pharmacists have the option of pursuing a Post-Graduate Year 1 residency to help prepare them for these and future clinical services. While residencies are not a requirement for practicing pharmacists, many student pharmacists seek out these programs to further augment their professional training and position themselves for providing and expanding clinical services.

Methodology: A cross-sectional, descriptive, online survey of student pharmacists across the U.S. in their third and fourth professional years to determine:

a) Number of student pharmacists in their last 2 years of the PharmD program considering applying to any residency programs post-graduation,
b) Student pharmacist awareness of current and evolving clinical and patient-care opportunities within the pharmacy profession,
c) Student pharmacist perception of education and training provided and skills obtained in a community versus health-system PGY1 residency program.

A similar survey was completed in 2008, before many of the current national legislative changes to our healthcare system had been approved. Comparing these results with the 2008 survey will allow us to identify changes in perceptions about residency programs and will inform the greater pharmacy community about student pharmacist’s practice expectations and help to shape future goals of residency programs.

Results and conclusions of the survey will be presented.

ACPE #:0126-9999-13-372-L04-P
Learning Objectives:
Describe student pharmacist perceptions about PGY1 residency programs and awareness of advanced pharmacy practice opportunities.
List two differences in perception between a community pharmacy residency and a health-system pharmacy residency.


**363 - HUMAN IMMUNODEFICIENCY VIRUS (HIV) ANTIRETROVIRAL ERROR REDUCTION AT AN ACADEMIC MEDICAL CENTER**

D1. Medication Safety

Presented by:

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Presenting on Wednesday, May 15 at 9:30 AM in Palm I

Introduction: The complexity of highly active antiretroviral therapy (HAART) and the potential for drug-drug interactions puts HIV patients at high risk for medication errors. This study was conducted to describe and quantify antiretroviral medication errors at Oregon Health & Science University (OHSU). This information will be used to identify and implement system improvements to prevent antiretroviral errors at OHSU.

Methodology: A retrospective chart review was performed on patients with antiretroviral orders dated from 7/1/11-6/30/12 (Expected N=100). Patients were excluded if they were <18 years old, did not have a diagnosis of HIV, were obstetrics patients, or were only seen in the emergency department. The medication administration records were assessed for complete antiretroviral regimens, administration of medications within 24 hours of admission, correct dosing of antiretrovirals, and contraindicated or clinically actionable antiretroviral drug interactions (e.g. interactions that require specific timing of medication administration or specific dose adjustments) as defined by the U.S. Department of Health and Human Services (DHHS) guidelines. Results of this study included the rate of antiretroviral errors and potential contributing characteristics and factors that may increase the risk for of antiretroviral errors. Other outcomes included the identification of system improvements such as modifications to medication alerts and default dispensing parameters, implementation of new features in the electronic health record, and development of educational materials.

Results and conclusions: To be presented

ACPE #:0126-9999-13-373-L02-P

Learning Objectives:
- Describe common antiretroviral medication errors as identified in the literature and in this study.
- List two potential system changes that may be implemented as a result of this study.


**364 - COMPARISON OF PHARMACY MANAGED HEPARIN PROTOCOL VERSUS USUAL CARE**

B4. General Clinical Practice

Presented by:
Frances McQuiston, PharmD
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Presenting on Wednesday, May 15 at 11:30 AM in Royal II

Introduction: Pharmacy Practice Protocols are widely used throughout health care systems in the inpatient setting to standardize patient care delivered by physicians, nurses, and pharmacists. The heparin protocol at Kaiser Permanente San Rafael was implemented in September 2012 to allow pharmacists to manage heparin. The Inpatient Pharmacy Anticoagulation Service may act under physician-approved protocol to monitor the use of unfractionated heparin (UFH). Prior to this protocol approval, a usual care model was in place in which nursing staff followed guidelines for heparin lab draws and adjustments. The protocol now clearly specifies pharmacists, in consultation with physicians and nurses, to monitor Anti-Factor Xa levels, time of blood draws, and to make adjustments to the rate and dose of heparin. Additionally, pharmacists may order pertinent labs within the scope of the protocol.

Methodology: The study analyzes patients above age 18 who are eligible to receive either cardiac or non-cardiac heparin per protocol. The two protocols have different indications, goals, and recommended adjustments. For example, the Anti-Factor Xa therapeutic goal for the cardiac heparin protocol ranges between 0.11 – 0.4 units/mL and 0.3 – 0.7 units/mL for the non-cardiac heparin protocol. This retrospective study compares six months of pharmacist managed care per protocol versus six months of usual standard care guidelines. The study identifies if therapeutic Anti-Factor Xa levels were achieved, the time it took to reach therapeutic levels, and if the protocol was appropriately adhered to.

Results: The study will assess the effectiveness and efficiency of the heparin protocol under pharmacy management by evaluating the correlation of Anti-Factor Xa levels with the time to achieve therapeutic concentration, appropriate protocol adherence, length of hospital stay, and adverse drug reactions.

Conclusion: Study and data collection are in progress.

ACPE #:0126-9999-13-374-L01-P
Learning Objectives:
  - Describe a benefit of adherence to the unfractionated heparin protocol.
  - List statistically significant associations between Anti-Factor Xa levels with length of hospital stay or adverse drug reactions.


365 - HIGH DOSE VERSUS LOW DOSE HEPARIN PROTOCOL IN BRAIN INJURED PATIENTS WITH CONCOMITANT THROMBOSIS
B3. Critical Care

Presented by:

Ryan McTish, PharmD
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Presenting on Wednesday, May 15 at 3:00 PM in Executive 715
Current literature has successfully demonstrated that the routine use of unfractionated heparin (UFH) in the setting of acute brain injury poses more risk than benefit. However, a select group of acutely brain injured patients have concomitant thrombosis or significant risk factors for thrombosis and the benefits of UFH in these patients may outweigh the risks. As such, the University of Utah Hospital (UUH) adopted a bolus-free heparin stroke protocol in 2006 for those patients who required therapeutic anticoagulation in the setting of acute ischemic stroke. Retrospective evaluation of this protocol revealed that therapeutic aPTT values were not reached on average until 19 hours after the initiation of the UFH infusion. As a result, patients remained at an unsafe risk for thrombosis during that time period. In order to address this problem, UUH adopted both a new high dose and low dose brain injury heparin protocol to replace the previous heparin stroke protocol in August 2012. The high dose protocol incorporates a 30 units/kg bolus for those patients with a higher risk of thrombosis and a need for more rapid attainment of therapeutic aPTT levels. In contrast, the low dose protocol utilizes a bolus-free regimen for those patients at lower risk of thrombosis or increased risk of hemorrhage.

The purpose of this study is to evaluate the safety and efficacy of the new brain injury heparin protocols at UUH in preventing or treating recurrent thrombotic events without increasing hemorrhagic risk in the setting of acute brain injury. The primary outcome of this study is the rate of recurrent thrombosis. Secondary outcomes include time to reach a therapeutic aPTT, rate of supratherapeutic aPTT levels > 150, rate of hemorrhagic events, and mortality rates secondary to a recurrent thrombotic event or hemorrhagic complication.

This study is a retrospective, descriptive, observational, quality assurance project. The new brain injury heparin protocols were approved by the P&T committee at UUH and implemented into CPOE on August 13, 2012. Patients were prospectively identified for study by inquiring for both brain injury heparin protocol orders in the CPOE system at UUH between August 13, 2012 and February 13, 2013. Patient’s electronic charts were then accessed and retrospectively evaluated to collect necessary data for outcome analysis. Primary and secondary outcomes remain under investigation, with data collection and evaluation currently being conducted. Retrospective data from the new brain injury heparin protocols will be compared to the data collected from the previous heparin stroke protocol to evaluate the effectiveness of the protocol change. The results obtained from this study will be used to further guide the future treatment of this high risk population at UUH and will be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-375-L01-P
Learning Objectives:
- List the indications for therapeutic heparin anticoagulation in the setting of acute brain injury.
- Describe the safety and efficacy of the new high and low dose brain injury heparin protocols at UUH.


366 - IMPACT OF PHARMACISTS IN REDUCING READMISSION RATES OF HEART FAILURE PATIENTS
B4. General Clinical Practice

Presented by:

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Presenting on Wednesday, May 15 at 1:00 PM in Royal II
Heart Failure (HF) is a progressive chronic disease, which currently affects 6.5 millions Americans, with an estimated increase by 25% in year 2030. Heart Failure remains one of the significant reasons for hospital admissions and care. Currently 20% of patients with Heart Failure are readmitted within 30 days. Reduction in Heart Failure readmission rates is the main priority for many hospitals to avoid reduction in reimbursements by Center for Medicare and Medicaid Services. The main objective of this single-center, longitudinal/observational study is to identify the impact of pharmacist’s involvement in discharge counseling in reduction of readmission rates, medication adherence and patient satisfaction. Pharmacists were called to the patient’s room after the completion of discharge medication list by the health care team and provided comprehensive medication consultation. Patients with Heart Failure diagnosis were included in this study. The data were collected on the following: Time spent by pharmacist to provide discharge consultation, number of Heart Failure medications which pharmacist educated the patient, assessment of effectiveness of consultation by teach back method, and patient’s satisfaction. The secondary objective of the study is to determine opportunities for pharmacist involvement in continuity of care to decrease readmission rates for Heart Failure patients. The study results will be presented in Western State Conference.

ACPE #:0126-9999-13-376-L01-P
Learning Objectives:
- Describe the positive impact of Pharmacists in reduction of hospital readmission of heart failure patients.
- List opportunities for pharmacists’ involvement with heart failure patients continuity of care.


### 367 - OCCURRENCE OF THROMBOEMBOLIC EVENTS IN PATIENTS ON WARFARIN WITH A SUBTHERAPEUTIC INR: A RETROSPECTIVE DATA ANALYSIS.

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Amanda Melton, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Royal V

BACKGROUND: The annual incidences for venous thromboembolism and cardioembolic stroke in the United States are approximately 900,000 and 150,000, respectively. Warfarin is highly effective in preventing these thromboembolic complications; however, its complex pharmacokinetic profile and narrow therapeutic window can make it difficult to manage. It is estimated that each patient is only within therapeutic range 60 percent of the time on warfarin. The primary focus of current literature has been supratherapeutic international normalized ratios (INR), including etiology, outcomes, and management. There are considerably less data published regarding subtherapeutic INRs, which pose an increased risk for thromboembolic complications such as deep vein thrombosis (DVT), pulmonary embolism (PE), or embolic stroke.

METHODS: This is a retrospective chart review conducted at an urban tertiary care hospital. The primary objective of this study is to determine the percentage of patients on warfarin who presented to the study site’s emergency department (ED) with a thromboembolic event and subtherapeutic INR (an INR falling below patient-specific range; generally, < 2). The secondary objective is to identify any potential patient-specific factors such as age, ethnicity, historical time within therapeutic range, duration of treatment, and bridging status to determine
any possible correlation between these and the subtherapeutic INR and/or thromboembolic event. Patients on warfarin who presented to the ED between March and August 2012 with a primary diagnosis of DVT, PE, or embolic stroke will be included in this study. Patients younger than 18 years old and/or patients who did not have an INR drawn upon presentation to the ED will be excluded. Using electronic medical records, the following data will be collected: patient demographics, pertinent past medical history, drug interactions, lab values, home dose of warfarin, intended and current durations of warfarin therapy, bridging status, time within therapeutic range and any dose changes in the month prior to presentation. All data will be recorded without patient identifiers and remain confidential. Results and conclusion of the study will be presented.

ACPE #:0126-9999-13-377-L01-P
Learning Objectives:
- Identify potential risk factors for subtherapeutic INRs and resultant thromboembolic complications.
- Discuss the incidence of thromboembolic events in patients with a subtherapeutic INR.


368 - TRANSITION OF CARE INTERVENTIONS TO IMPROVE QUALITY OF CARE IN ACUTE MYOCARDIAL INFARCTION PATIENTS
B4. General Clinical Practice

Presented by:

Pamela Mendoza, PharmD
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Presenting on Wednesday, May 15 at 1:30 PM in Royal II

The objective of this prospective, matched cohort study was to determine the impact of pharmacist interventions in patients with acute myocardial infarction (AMI) at University of California, Davis Medical Center (UCDMC). Patients at least 18 years of age with a primary diagnosis of an acute coronary syndrome-related event in the Davis 6 cardiology unit were included. 16 patients from January 1, 2013- January 31, 2013 met inclusion criteria and received the following interventions: medication reconciliation upon admission and at discharge, patient and/or family education prior to discharge, bedside medication delivery, and a telephone follow up within 72 hours post-discharge. Past medical history and procedural interventions during hospital admission were also collected to stratify severity of illness in the study population. Study outcomes include hospital readmission 30 days post-discharge, UCDMC core measures for AMI patients reported in the quality management dashboard, patient satisfaction with care processes (HCAHPS Scores), and medication adherence. Results and conclusion will be presented.

ACPE #:0126-9999-13-378-L01-P
Learning Objectives:
- List three transition of care interventions to possibly reduce hospital readmission in high risk patients.
- Explain the advantages and challenges in implementing bedside medication delivery.

369 - THE IMPACT OF CIPHERVOICE AND PHARMACY INTERVENTION ON HCAHPS PERFORMANCE MEASURES
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Melissa Meyer, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Sunset IV

Introduction:
The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a standardized survey tool developed by the Centers for Medicare and Medicaid Services (CMS) to measure patients’ perceptions of the quality of care provided during their hospital stay. HCAHPS survey results are publically reported by CMS to support consumer choice and serve as an incentive for hospitals to increase their quality of care. Under Value-Based Purchasing (VBP), a mandatory national pay for performance program implemented by CMS, hospital reimbursement is tied to patient feedback, with 30% of the total reimbursement score accounted for by patient experience and HCAHPS results.

At the time of hospital discharge, patients are often inundated with information regarding medications, medical information, and follow-up appointments. Their questions often remain unanswered which may contribute to a negative patient experience and possibly place them at greater risk for hospital readmission. To better identify this at risk population, our hospital implemented the automated patient follow-up phone service, CipherVoice. The goal of this service is to help hospitals influence patient satisfaction through targeted service recovery, earn financial incentives tied to HCAHPS survey results, and reduce 30-day readmission rates.

Methodology:
A retrospective chart review analyzing HCAHPS scores for a six month period before and after implementation of CipherVoice. During the intervention period, all patients receiving a discharge phone call answering “Yes” to whether they have medication-related questions will be identified through a computer generated report. Records and pharmacists’ comments will further be examined. Interventions will be characterized into one of four categories including: unclear discharge instructions, medication specific question, refill requests, or other for any nonspecific questions. The mean aggregate change in HCAHPS scores pertaining to inpatient medicine communication, inpatient discharge information and changes in 30-day readmission rates during the intervention period will be compared to the same measures prior to CipherVoice implementation. Secondary outcome measures will evaluate changes in survey vendor national percentile rankings.

This quality assurance project assesses the value of a pharmacist augmented patient follow-up phone service in reconciling medication discrepancies or related questions. Changes in HCAHPS scores may not be directly linked to CipherVoice interventions; however, analysis of such interventions and trends in the types of questions following discharge can help identify ways to improve inpatient medication communication and discharge counseling. Insights into the types of interventions made and potential impact for improving inpatient care, along with the results and conclusion of this analysis, will be presented.

ACPE #:0126-9999-13-379-L01-P
Learning Objectives:
1) Describe the importance of HCAHPS performance measures on VBP and CMS reimbursement rates.
2) Explain how CipherVoice and telephone counseling may improve patient safety and satisfaction, HCAHPS scores, and post-discharge medication understanding.
370 - USE OF THE MEDICATION EVENT MONITORING SYSTEM TO MEASURE ADHERENCE AND EFFECTS ON OUTCOMES IN PATIENTS WITH HYPERTENSION
B1. Ambulatory Care

Presented by:

Adele Miles, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Bay View

Background: Medication adherence is particularly important in relatively asymptomatic disease states such as hypertension, where a disconnect exists between the actual severity of the condition itself and the patient’s perception of the threat to their health. At the Veterans Affairs Palo Alto Health Care System (VAPAHCS), there are approximately 6,070 patients with hypertension, and it is estimated that 35% of these patients have a blood pressure (BP) of greater than 140/90 mmHg. Adherence at VAPAHCS can be monitored with the online regional VA Dashboard, which provides patient-specific BP readings, medication adherence data reported as a medication possession ratio (MPR), and current BP medication prescribed. Despite having access to an online tool, many clinicians do not utilize the Dashboard to monitor adherence. Our project will utilize Medication Event Monitoring System (MEMS) caps to record adherence data (i.e., the exact date and time the bottle is opened) and evaluate the effect on the patient’s antihypertensive medication MPR and blood pressure. The primary objective will be to compare adherence in the MEMS group to the MEMS + adherence behavior feedback (ABF) group at 3 months. Only the MEMS + ABF group will be given feedback by a pharmacist regarding their antihypertensive medication adherence over the past month. A secondary objective will be to compare the percentage of patients that reach their blood pressure goals as defined by JNC VII in the MEMS bottle alone group to the MEMS bottle + ABF group at 3 months. Lastly, we will be evaluating the feasibility of using the MEMS bottle though a patient questionnaire given at 3 months.

Methodology: Participants were identified using the online regional hypertension Dashboard. Inclusion criteria included adults older than 18 years old with uncontrolled hypertension and poor adherence to one of their current anti-hypertensive therapy (defined as an MPR <80% on the Dashboard) and who were willing to travel to Palo Alto for the duration of the project. MPR was defined as a percentage of the sum of the days supply of medication received divided by the sum of days elapsed from when the prescription was issued x 100. Participants were excluded if they lived in a nursing home or were institutionalized, were dependent on another person for medication intake, had cognitive impairment, were seen by a non-VA primary care physician, or filled the project medication outside of the VA. Enrollment was restricted to 10 participants due to the limited number of MEMS caps available. The group assignments were done in a 1:1 fashion prior to the first visit. Both groups were instructed that a monthly appointment is required to download data from the MEMS cap and record BP for 3 months. Results and conclusions will be presented.

ACPE #:0126-9999-13-380-L01-P
Learning Objectives:
Describe the use of a Medication Event Monitoring System on veteran medication adherence.
Describe the impact of a MEMS cap on blood pressure outcomes in veterans.
371 - EFFECT OF STATINS ON INCIDENT DIABETES IN VETERANS

B1. Ambulatory Care

Presented by:

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Presenting on Wednesday, May 15 at 9:00 AM in Bay View

On March 1, 2012, the FDA updated the labeling of statin medications to include risk of incident diabetes and increases in HbA1c and/or fasting plasma glucose. This update was based on the FDA’s evaluation of clinical trial meta-analyses and data from published literature. Although statin therapy may be associated with a higher incidence of diabetes, the extent to which statins affect patients without major risk factors for developing diabetes is unclear. The objective of this study is to investigate the association between diabetes diagnosis and statin use in veterans and compare patients with low versus high risk factors for acquiring diabetes. This retrospective data extraction and analysis will include patients of Veterans Affairs Northern California Health Care System with a diagnosis of diabetes during the enrollment period from January 1, 2006 through December 31, 2011. Patients with diabetes will be stratified by presence or absence of statin therapy. Outcomes will include risk factors for developing diabetes and variations in lipid panel. The relationship between the duration of use and dose of statin and subsequent development of new onset diabetes will be revealed. Results and conclusions will be presented.

ACPE #:0126-9999-13-381-L01-P
Learning Objectives:
- Describe the possible mechanisms of statin-induced type 2 diabetes mellitus
- Explain the risks and benefits of statin therapy and incident diabetes based on the results of this study

372 - INJURY RISK ASSOCIATED WITH SKELETAL MUSCLE RELAXANTS NOT ON NCQA’S HIGH RISK MEDICATION LIST

D1. Medication Safety

Presented by:

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Presenting on Wednesday, May 15 at 10:00 AM in Palm I
Reducing high-risk medication use in the elderly is an important opportunity to decrease risk of accidental injury. Studies show that elderly patients can present alterations in practically all pharmacokinetic processes. These alterations can contribute to an increased risk of adverse drug reactions. One important medication class of concern is the skeletal muscle relaxants. These medications are used by an estimated 2 million individuals per year, with approximately 300,000 being elderly. A High Risk Medication (HRM) measure released by National Committee for Quality Assurance (NCQA) included the following specific skeletal muscle relaxants (SMR) as medications to avoid in the elderly: orphenadrine, chlorzoxazone, metaxalone, cyclobenzaprine, methocarbamol, and carisoprodol. However, possible alternative treatments are SMRs not included in the HRM measure. This pre-post cohort analysis will evaluate the injury risk associated with skeletal muscle relaxants not on NCQA’s HRM list. This is a retrospective chart review of Kaiser Permanente Diablo Service Area patients that are 65 years and older between January 1, 2011 through December 31, 2011. Patients will be included if they purchased the following SMRs: baclofen, tizanidine, or dantrolene. In order to evaluate patients who are newly initiated on these agents, patients will be excluded if they purchased any SMR in the 6 months prior to enrollment in the study. The primary outcome will be to compare the rate of injury in a 60-day period before and after initiating the study SMRs. Injuries will be defined by the following: fracture, fall with or without injury, dislocation, contusion, concussion, crush injury, transportation accident, and injury not otherwise specified. Injury rates will be calculated to determine the injury risk with these medications. The results of this project will provide insight into the safety of SMRs not included on NCQA’s HRM list. While efficacy will not be studied, the findings may provide evidence that safer treatment alternatives exist for SMRs on NCQA’s HRM list.

ACPE #:0126-9999-13-382-L01-P
Learning Objectives:
- Explain the epidemiology of injuries associated with skeletal muscle relaxants.
- Describe why elderly patients are at an increased risk of injury with skeletal muscle relaxants.


373 - THE EFFECTS OF PHARMACY-LED INFLUENZA VACCINE EDUCATION IN A PEDIATRIC HEMATOLOGY AND ONCOLOGY CLINIC
B1. Ambulatory Care

Presented by:

SunYoo Min, PharmD
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Presenting on Wednesday, May 15 at 9:30 AM in Bay View

Influenza is a common disease that can have dangerous outcomes such as hospitalization and death. While people of all ages can contract the disease, children have the highest rates of infection. Those who are at the highest risk of serious illness and death are elderly, children under 2 years of age, and people with certain medical conditions such as sickle cell and cancer. The best method for prevention of infection from influenza and its severe complications is annual influenza vaccination. The American Academy of Pediatrics (AAP) recommends that all pediatric patients receiving immunosuppressive therapy, including chemotherapy, be vaccinated against influenza. However, only 9-31% of high-risk children receive the vaccine. The pharmacists’ role in immunizations has evolved from distributors to educators and in some settings to immunizers, and studies show that pharmacist-managed programs help to improve vaccination rates.
At Loma Linda University Medical Center (LLUMC) - Pediatric Hematology/Oncology and Stem Cell/Bone Marrow Transplant (SCT/BMT) Outpatient Clinic, pharmacist-led influenza vaccine education program was implemented on 10/01/12. During routine clinic visits, subjects were provided with education on the influenza vaccine by pharmacy educators who include trained pharmacy students, pharmacy residents, and pharmacists. After education was provided, the pharmacy educators asked subjects to complete a questionnaire regarding their acceptance of the influenza vaccine and perceptions of their interaction with the pharmacy representative. The questionnaire did not include patient identifying information. The objectives of this study are to 1) assess patient or guardian’s perception of influenza vaccination education provided by pharmacy educators, 2) identify factors that cause patients or guardians to be hesitant to receive the influenza vaccination and 3) determine the rate of acceptance of the influenza vaccine after education is provided by pharmacy educators. The questionnaire responses collected between 10/01/12 and 1/31/2013 will be utilized to achieve the objectives of the study.

Results and conclusions will be presented.

ACPE #:0126-9999-13-383-L01-P
Learning Objectives:
1. Assess patient or guardian’s perception of influenza vaccination education provided by pharmacy educators.
2. Identify factors that cause patients or guardians to be hesitant to receive the influenza vaccination.


**374 - THE EFFECT OF A PHARMACIST’S INTERVENTION ON REDUCING PPI USE FOR STRESS ULCER PROPHYLAXIS IN NON-ICU PATIENTS**
A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

**Aimee Mishler, PharmD**
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Presenting on Tuesday, May 14 at 11:30 AM in Mission Bay Foyer

Introduction: Guidelines for the use of proton pump inhibitors (PPIs) for stress ulcer prophylaxis in patients who are critically ill have been established and proven to significantly prevent upper gastrointestinal (GI) bleeding in at risk patients. Unfortunately, there are no available guidelines defining the role of stress ulcer prophylaxis in non-ICU patients. This has led to overutilization of PPIs in non-ICU settings with up to 70% of PPIs prescribed for patients that do not have an indication for stress ulcer prophylaxis. Up to 54% of patients started on stress ulcer prophylaxis in the non-ICU inpatient setting are discharged home on the medication without an indication for continued use. This is important because, although proton pump inhibitors have been considered well tolerated and generally free from side effects, especially with short term use, studies have linked prolonged use of PPIs to community acquired pneumonia (CAP), nosocomial pneumonia, Clostridium difficile infections, increased fracture risk, and hypergastrinemia.

Objectives: The primary objective of this study was to examine the percent change of proton pump inhibitors prescribed for non-ICU patients without an indication for stress ulcer prophylaxis before, during, and after a pharmacy intervention. This study utilized an adapted ICU guideline criteria specifying that stress ulcer
prophylaxis is indicated for one of the following: mechanical ventilation ≥ 48 hours, coagulopathy, traumatic brain injury, burn, GERD, PUD, GI bleed, home acid suppressive therapy; or ≥2 of the following: ICU stay >1 week, occult bleeding, sepsis, NPO, high dose oral corticosteroids, and chronic oral NSAIDs.

Methods: This was a retrospective preintervention, concurrent intervention, and retrospective postintervention study comparing the percent of proton pump inhibitors prescribed for stress ulcer prophylaxis in patients that met criteria to those that did not meet criteria. The time period consisted of before, during, and after implementation of a pharmacist driven educational program and chart recommendation to discontinue the PPI in those patients that did not meet criteria. Patients were identified by running a computer based report listing non-ICU patients who were prescribed a PPI during the months of October 2012 (preintervention), January and February 2013 (intervention), and March 2013 (postintervention). During the preintervention period all patient charts were retrospectively reviewed to determine the baseline percentage of PPI use according to criteria. A daily report was run during the intervention period identifying non-ICU patients who received a PPI. These patient’s charts were concurrently reviewed to determine if the PPI was prescribed according to criteria. If not, a recommendation to discontinue the PPI was left in the medical chart. These patients were observed to see if the medication was discontinued. For the postintervention period, all patient charts were retrospectively reviewed to determine the percentage of PPI use according to criteria. Data collected included demographics, home medications, past medical history, current diagnosis, inpatient location, inpatient medications, and coagulation studies.

Results and Conclusion: Results and conclusions will be presented.

ACPE #:0126-9999-13-384-L01-P

Learning Objectives:
- List characteristics for appropriate use of PPIs for stress ulcer prophylaxis
- Explain the risks and adverse effects associated with long-term use of PPIs.


375 - EVALUATION OF ACUTE CORONARY SYNDROME/MYOCARDIAL INFARCTION HEPARIN PROTOCOL IN OBESE PATIENTS

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

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Presenting on Tuesday, May 14 at 4:30 PM in Royal V

Introduction

Obesity is a growing epidemic worldwide. Dosing of unfractionated heparin (UFH) in obese patients for acute coronary syndrome (ACS) is very limited. At the University of Utah Hospitals and Clinics (UUHC), the current protocol for ACS is 60 units/kg initial bolus (maximum 4000 units) followed by weight based maintenance infusion (maximum 1000 units/hour). The previous protocol included the initial loading dose of 60 units/kg (maximum 5000 units) and maintenance infusion of 12 units/kg/hour (maximum 1500 units/hour). Anecdotal clinical data from patient care activities has revealed delayed achievement of target aPTT in obese patients managed with therapeutic heparin for ACS, particularly after the change in protocol.

Methodology
It is a retrospective quality improvement project to compare the prior ACS protocol with the new ACS protocol to ascertain if the current UFH protocol for ACS is appropriate for obese patients. This project is comparing two groups of obese patients (BMI>30 kg/m²): one group consisting of obese patients receiving UFH according to prior protocol from 04/01/2011 to 03/31/2012, and the second group consisting of obese patients receiving UFH according to new protocol from 05/01/2012 to 04/30/2013. The primary outcomes are to determine whether current protocol is followed, and to evaluate whether target aPTT is reached within 24 hours in obese population. Standard descriptive statistics will be used to analyze outcomes. Results and conclusions will be presented.

ACPE #:0126-9999-13-385-L01-P

Learning Objectives:
Describe the clinical implication of subtherapeutic heparin dosing in acute coronary syndrome (ACS) patients
Explain if an individual institution's weight-based heparin protocol for ACS is appropriate in their obese patient population


**376 - IMPACT OF A CLINICAL PHARMACY DIABETES SERVICE ON TYPE 2 DIABETES MELLITUS OUTCOMES**

B1. Ambulatory Care

Presented by:

Megan Monroe, PharmD
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*Presenting on Wednesday, May 15 at 11:00 AM in Bay View*

**Introduction**

In 2011, the Kaiser Permanente Colorado Clinical Pharmacy Diabetes Service (CPDS) was implemented to care for patients with type 2 diabetes mellitus (T2DM). This service delivers pharmaceutical care with a centralized, telephonic model led by a clinical pharmacy specialist who focuses on oral diabetes medications, blood pressure, and lipid management. A patient not receiving a maximum dose of two oral anti-hyperglycemic therapies can be referred to the CPDS by their health care provider for sub-optimal glycemic control (i.e., hemoglobin A1C > 8 %) based on the most recent A1C measurement. Patients requiring insulin or other injectable hypoglycemic agents are followed by diabetes nurse managers and thus not enrolled in CPDS. While there are numerous publications to support pharmacist involvement in the care of patients with T2DM, the potential impact on quality measures related to the Healthcare Effectiveness Data and Information Set (HEDIS) has not been reported in previous studies. The purpose of this study is to evaluate the impact of the CPDS on quality and clinical outcomes including HEDIS measures and achievement of individualized A1C goal and changes in A1C over time.

**Methods**

This was a two-phase, retrospective matched cohort study of T2DM patients who received diabetes management from the CPDS or usual care. Phase One assessed quality outcomes that include the proportion of patients fulfilling HEDIS performance measures for Comprehensive Diabetes Care in 2011 and 2012 while Phase Two assessed clinical outcomes including achievement of individualized A1C goal and changes in A1C over time.
All study patients had an A1C > 8% at the time of enrollment. Patients were identified as either enrolled in the CPDS between 1/1/2011 and 10/31/11 or considered usual care if they had a diagnosis of T2DM as of 1/1/2011. Patients were assigned an individualized A1C goal of <7% or <8% based on age and co-morbidity history. Patients in Phase 1 were evaluated on having had an A1C measurement and meeting A1C goals in 2011 and 2012 as determined by HEDIS. Patients in Phase 2 were followed for one year to compare absolute change in A1C from baseline at six and twelve months, proportions of patients achieving their individualized A1C goal, and proportions of patients with T2DM-related emergency department visits or inpatient stays during the twelve month follow-up.

Results/Conclusions
Results will be presented.

ACPE #:0126-9999-13-386-L01-P
Learning Objectives:
- Explain the benefit(s) of a clinical pharmacy diabetes service.
- Describe the HEDIS measures for Comprehensive Diabetes Care that can be impacted by pharmacists’ interventions.


377 - CONTINUOUS INFUSION VERSUS INTERMITTENT VANCOMYCIN: A RETROSPECTIVE COHORT STUDY EXAMINING TIME TO A THERAPEUTIC LEVEL
A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 3:00 PM in Dockside

Introduction: Timing and appropriate antibiotics in septic patients admitted to the adult intensive care units (ICU) improves mortality. Vancomycin remains the most commonly used antibiotic to cover methicillin-resistant Staphylococcus aureus. Despite its frequent use, the most effective method to achieve a therapeutic vancomycin level is unknown. Intermittent infusion of vancomycin is traditionally used and recommended by the Infectious Diseases Society of America. Continuous infusion (CI) of vancomycin offers administration advantages and may lead to faster therapeutic levels than intermittent infusion. The primary objective of the study is to compare the time required to achieve therapeutic vancomycin levels in critically ill patients receiving CI versus intermittent infusions of vancomycin. The secondary objectives are to compare the number of vancomycin levels drawn between the two groups and to describe the differences in pharmacy interventions required as a result of vancomycin levels. In addition, we will conduct a survey of pharmacists and nurses to assess their comfort and knowledge regarding CI of vancomycin.

Methods: This study is a retrospective cohort study of patients admitted to the adult ICUs at the University of New Mexico Hospital between January 1, 2012 and December 31, 2012. Adult patients who received an initial vancomycin loading dose of 20mg/kg and maintenance vancomycin dose > 72 hours will be eligible for inclusion. Exclusion criteria include: creatinine clearance (CrCl) <30mL/min, pregnant women, and prisoners. The following data will be collected: demographics; reason for admission; infection type; Charlson comorbidity index; Simplified Acute Physiology Score (SAPS II); complete blood count; CrCl throughout therapy; culture and
susceptibility data; vancomycin levels, doses, and duration of therapy. The time to therapeutic level will be compared between groups using a Cox proportional model adjusting for other predictors (e.g., age, ICU unit, SAPS II score). A logistic regression will be used to evaluate whether the mode of administration is associated with achieving a therapeutic level adjusting for other predictors. P-values < 0.05 will be considered statistically significant. All statistical analyses will be performed using the Statistical Package for Social Sciences (SPSS), version 19.0. Results and conclusions will be presented.

ACPE #:0126-9999-13-387-L01-P

Learning Objectives:
1. Explain the rationale behind administering vancomycin as a continuous infusion versus an intermittent infusion.
2. Describe three reasons why continuous infusion vancomycin may save time and cost when compared to intermittent vancomycin.


378 - EXTENDED-INTERVAL TOBRAMYCIN DOSING IN PEDIATRIC PATIENTS WITH CYSTIC FIBROSIS
B6. Pediatric or Gender Specific Care

Presented by:

Sandra Moorhouse, PharmD
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Presenting on Wednesday, May 15 at 9:30 AM in Sunset II

INTRODUCTION: Pulmonary exacerbation is the leading cause of death in patients with cystic fibrosis (CF). Combination antipseudomonal antibiotics are recommended for pulmonary exacerbations of CF in patients with known colonization with P. aeruginosa. Tobramycin, an aminoglycoside antibiotic with good activity against this organism, is often one of the antibiotics selected. Major strides in the understanding of aminoglycoside pharmacodynamics have been made over the past three decades, leading to the use of extended-interval dosing (“once-daily dosing”) rather than multiple-daily dosing (MDD) as the preferred dosing method for most indications, including pulmonary exacerbations of CF. However, the optimal initial dosing regimen for this indication is currently unknown. Attainment of the following two pharmacodynamic targets is expected to optimize efficacy: a 30-minute “peak” serum tobramycin concentration between 20 and 40 mcg/mL and a 2- to 6-hour time period with undetectable serum concentrations (T< 0.5 mcg/mL). We hypothesize that a low proportion (<30%) of patients with cystic fibrosis admitted to CHOC Children’s achieve both pharmacodynamic targets when initiated on extended-interval intravenous tobramycin. METHODOLOGY: Pediatric patients (age ≤ 18 years) with CF who received extended-interval tobramycin for pulmonary CF exacerbations at CHOC Children’s between January 1, 2009 and April 30, 2013 will be screened for eligibility. Patients will be included if the results of two detectable serum concentrations drawn between the third and fourth dose are available. The first of these concentrations must have been drawn at least 1.5 hours after the end of the third dose, and the second concentration must have been drawn at least 6 hours after the first serum concentration. Pregnant patients, patients receiving renal replacement therapy, and patients with severe burns, ascites and/or fluid overload will be excluded. The investigator will verify the timing of doses given and serum concentrations obtained and will perform pharmacokinetic calculations to evaluate whether the patient achieved both
pharmacodynamic targets. If the proportion of patients achieving both goals is low (< 30%), an optimal initial dosing regimen will be identified. The optimal initial dosing regimen is the regimen that allows the maximum percentage of patients to achieve both pharmacodynamic goals without requiring a complicated frequency of administration (i.e., q18h or q36h dosing). The percentage of patients who develop nephrotoxicity and ototoxicity will also be assessed to determine whether there is a correlation between toxicity and the length of time during which serum concentrations are undetectable. RESULTS: Study in progress; final results to be presented at the conference. CONCLUSION: This study will determine the proportion of CF patients who achieve tobramycin pharmacodynamic targets associated with optimal efficacy, and will potentially assist in the development of an initial recommended tobramycin dosing regimen with high probability of achieving both targets.

ACPE #:0126-9999-13-388-L01-P
Learning Objectives:
List the clinical advantages of extended-interval aminoglycoside dosing over multiple daily dosing.
Describe two aminoglycoside pharmacokinetic parameters that differ in patients with cystic fibrosis compared to those without.


379 - NEUTROPENIC HOSPITALIZATIONS IN BREAST CANCER PATIENTS: PRIMARY PROPHYLACTIC GRANULOCYTE COLONY-STIMULATING FACTORS
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Wednesday, May 15 at 10:30 AM in Sunset l

Introduction: Neutropenia is a known complication of myelosuppressive chemotherapeutic regimens. During the period of neutropenia, in which the absolute neutrophil count is ≤1500 cells/microliter, an increased risk of potentially life-threatening infections is present. While cancer treatment response is dependent on timely delivery of standard chemotherapy doses, this optimal treatment may be delayed or discontinued as a result of neutropenia. Caggiano, et al. (2005) estimated the national incidence of neutropenia hospitalizations in cancer patients to be >60,000 annually, with an associated mortality rate of 6.8%. To minimize deviations from optimal chemotherapeutic regimens and reduce the risk of infections associated with neutropenia, the National Comprehensive Cancer Network (NCCN) recommends primary prophylaxis with granulocyte colony-stimulating factors (G-CSF) for three common neoadjuvant/adjuvant breast cancer chemotherapeutic regimens with known high risk for neutropenia (docetaxel/doxorubicin/cyclophosphamide, TAC; dose-dense doxorubicin/cyclophosphamide followed by paclitaxel, AC->T; docetaxel/cyclophosphamide, TC). G-CSF works to accelerate white blood cell production by the bone marrow and decrease the incidence of infection, as manifested by febrile neutropenia. While some breast cancer patients receive primary prophylaxis with G-CSF in conjunction with the above-named chemotherapeutic regimens, some clinicians may omit primary prophylaxis – in which case patients receive secondary prophylaxis with G-CSF as their ANC declines. The objective of this retrospective study was to determine the incidence of neutropenic hospitalizations and all-cause mortality in
Kaiser Permanente (KP) Southern California members with breast cancer receiving one of the three above-named chemotherapeutic regimens with and without primary prophylactic G-CSF.

Methodology: A retrospective chart review was conducted between January 2009 and December 2011. Members were included if they had a documented diagnosis of breast cancer and received ≥1 of the above-named chemotherapeutic regimens. Patients were excluded if they were non-continuous member, did not have pharmacy benefits through KP, or received hematopoetic stem cell transplantation prior to or during the study period. Those included in the study were categorized into two cohorts: those receiving primary prophylactic G-CSF (defined as initiation and receipt of ≥1 dose of G-CSF no later than Day 5 of Cycle 1 of each of the above-named chemotherapeutic regimens) and those not receiving primary prophylactic G-CSF. The primary endpoint of the study was hospitalizations for neutropenic fever; the secondary endpoint was all-cause mortality.

Results: Will be presented
Conclusion: Will be presented

ACPE #:0126-9999-13-389-L01-P

Learning Objectives:
- Explain primary versus secondary prophylactic use of granulocyte colony-stimulating factors in conjunction with chemotherapeutic agents.
- Describe the effects of granulocyte colony-stimulating factor use on the incidence of neutropenic complications and mortality.


380 - IMPACT OF A CLINICAL PHARMACIST-LED INTERVENTION ON DELIRIUM ASSESSMENT AND MANAGEMENT IN THE INTENSIVE CARE UNIT

B3. Critical Care

Presented by:

Mandy Morris, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Executive 715

Introduction:
Delirium in the intensive care unit (ICU) is an independent predictor of increased mortality and is associated with increased healthcare costs and prolonged neurocognitive impairment after discharge. The Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) is a validated screening tool developed to assess delirium in critically ill patients. Delirium screening using the CAM-ICU was implemented in University of California, San Francisco (UCSF) Medical Center ICUs in 2010, but there is presently no standard protocol for prevention or treatment of delirium within the institution. While antipsychotic therapy remains the mainstay of treatment for ICU delirium, evidence to support the use of such agents is lacking. Sedative regimens containing benzodiazepines have been shown to exacerbate delirium symptoms, making the avoidance of these agents an important pharmacologic preventative strategy in addition to non-pharmacologic therapies.

The purpose of this study is to assess the impact of a clinical pharmacist-led intervention on delirium assessment and management in an academic medical center.

Methods:
A prospective chart review of adult patients admitted to the medical/surgical, cardiac and neurointensive care units was conducted for a 1-week time period in patients before and after a pharmacist-led intervention. Results of the ICU-related delirium screens were evaluated daily by the critical care pharmacist who provided recommendations for both non-pharmacologic and pharmacologic treatment strategies for ICU delirium prevention and treatment.

The primary objective was to analyze compliance rates with CAM-ICU assessments by critical care nurses and patient delirium status. Secondary objectives included assessing the use of non-pharmacologic preventative strategies, the avoidance of ICU-delirium precipitating medications such as benzodiazepines, and finally the prescribing patterns of antipsychotic therapy.

Results:
Evaluation of 353 12-hour nursing shifts in the medical/surgical unit demonstrated that the bedside exam was performed in 142 (40.2%) of nursing shifts with CAM-ICU positive screens in 24 (16.9%) of the assessments. Baseline compliance rates within the cardiac and neurointensive care units revealed CAM-ICU completion in 52 (26.9%) and 92 (49.4%) nursing shifts respectively. While the majority of nursing shifts within the cardiac ICU did not screen for delirium, a total of 14 (27%) of the completed bedside exams were determined to be CAM-ICU positive. In contrast, with a total of 186 12-hour nursing shifts, the neurointensive care unit initiated CAM-ICU assessments in 155 (83.4%), however 63 (33.8%) screenings were considered to be unable to assess.

Conclusion:
Baseline analysis of CAM-ICU completion rates indicate that the majority of critically ill patients are not screened for ICU-related delirium. Evaluation of the impact of a pharmacist-based intervention is ongoing, and educational efforts to standardize prevention and treatment across the healthcare team is underway.

ACPE #:0126-9999-13-390-L01-P
Learning Objectives:
Describe the importance of detection of ICU delirium.
Describe the impact of a clinical-pharmacist led intervention on delirium assessment and management in the intensive care unit.


381 - ASSOCIATION BETWEEN USE OF STRONGLY ANTICHOLINERGIC MEDICATIONS AND HIP FRACTURES IN OLDER ADULTS
B5. Long-Term, Geriatric or Hospice Care

Presented by:
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Presenting on Tuesday, May 14 at 11:30 AM in Sunset IV

Introduction:
The American Geriatrics Society (AGS) 2012 update of the Beers criteria identifies potentially inappropriate medications that should be avoided in older adults due to unfavorable safety risk and limited efficacy. AGS recommendations are based on systematic reviews performed to update and expand the criteria; however, studies quantifying the actual risk of these medications in the elderly are limited. AGS update includes a list of drugs with strong anticholinergic properties, compiled from studies that categorized and rated anticholinergics.
(ACHs) with the strongest potency. AChs can worsen cognition and delirium especially in the elderly; there is also some limited evidence in their increased risk of falls and fractures. Hip fractures in the elderly are known to be associated with poor functional outcomes, shorter life expectancy and increased overall healthcare burden. The purpose of this study is to determine if an association exists between strong AChs in older adults and hip fractures.

Methodology:
In this retrospective case-control study, patients 65 years of age and older who belong to a regional, integrated health care system and were hospitalized with a primary or secondary diagnosis of hip fracture, identified by ICD-9 codes, were matched with control subjects without these diagnoses. Data from 1998 to 2011 were retrieved from the electronic medical record database. Cases and controls were matched based on gender, age, race and medical center. Exposures to all prescriptions for AChs specified in the AGS update in both case and control subjects were investigated, and multivariate analysis was used to determine which medications were associated with increased risk of hospitalization for hip fracture. Degrees of exposure including dose, duration of treatment and prescription fill history were included in the analysis. Covariates include concurrent medications and conditions that affect bone density and risk of hip fractures. Conditional logistic regression was used to evaluate risk factors for hip fractures.

Results: To be presented
Conclusions: To be presented

ACPE #:0126-9999-13-391-L01-P

Learning Objectives:
Describe the relationship between the utilization of strongly anticholinergic medications and hip fractures in older adults
Describe how concomitant risk factors and medications impact the risk of hip fractures in older adults


382 - EVALUATION OF PATIENT OUTCOMES WITH FIXED, LOW DOSE RASBURICASE FOR TREATMENT OF HYPERURICEMIA ASSOCIATED WITH TUMOR LYSIS SYNDROME
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Wednesday, May 15 at 11:00 AM in Sunset I

Background: Tumor lysis syndrome (TLS) most frequently occurs in patients with hematologic malignancies and solid tumors with high proliferative rates. One consequence of TLS is hyperuricemia, which may lead to acute kidney injury. American Society of Clinical Oncology Guidelines recommend dosing rasburicase (ELITEK™) for treatment of TLS-associated hyperuricemia. Rasburicase, a recombinant enzyme that catalyzes uric acid oxidation to a more soluble product, currently holds FDA approval for treatment of pediatric patients at doses of 0.15 – 0.2 mg/kg IV daily for 5 days. Equivalent weight-based dosing is utilized in adults, despite lacking FDA approval. The estimated treatment cost of treating TLS in an adult is $5,400.
Numerous case series and a retrospective review conclude that single and/or fixed, low rasburicase doses appear safe and effective. Current UCDMC institutional guidelines recommend a fixed, low dose of 3 or 4.5 mg. This strategy significantly reduced costs to approximately $1,150 to $1,735 per TLS treatment cycle. Primary objective: to determine the efficacy of fixed, low dose rasburicase in treatment of adult TLS. Secondary objectives: characterization of prescribed rasburicase doses, mean time to a follow-up dose, the determination of serum uric acid concentration reduction after rasburicase administration, the incidence of hyperuricemia and TLS syndrome, acute kidney injury, hemodialysis, ICU stays and/or death and identification of additional or alternative TLS treatment modalities utilized to treat TLS and determine their frequency. Methods: This investigator initiated, single-center, retrospective chart review will evaluate leukemia, lymphoma, and solid tumor cancer patients > 18 years old, whom received rasburicase for treatment of TLS-associated hyperuricemia during January 1, 2001 through November 30, 2012. Patients will be identified through EPIC generated reports. Data points to be collected include diagnoses, serum uric acid concentrations and creatinines, electrolytes, white blood cell counts, hemodialysis sessions, ICU admissions, death, chemotherapy regimen, and inpatient medications delivered including alternative or additional TLS treatments. The probability of a satisfactory response to rasburicase, characterization of dose increments received, and the incidence of complications, hyperuricemia, and TLS will be will be estimated by the observed proportion. Additionally, 95% confidence intervals will be constructed for all estimated proportions. Serum uric acid reductions will be determined by calculating differences and depicted by histograms and stem-and-leaf plots. Kaplan-Meier plots will depict the time to follow-up doses and the median time calculated using a standard life-table approach and 95% confidence intervals. Descriptive statistics will summarize additional or alternative TLS treatment modalities.

Results and conclusions will be presented upon the completion of data collection and analysis.

ACPE #:0126-9999-13-392-L01-P

Learning Objectives:
- Identify patients at risk for developing tumor lysis syndrome
- Evaluate the efficacy of fixed, low dose rasburicase for treatment of hyperuricemia associated with tumor lysis syndrome


383 - CULTURE ALERT STICKERS (CAS) AND THEIR EFFECTS ON OBTAINING CULTURES FOR COMMUNITY ACQUIRED PNEUMONIA (CAP) IN THE EMERGENCY DEPARTMENT (ED)

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 2:30 PM in Dockside

Background: Inappropriate utilization of antibiotic therapy can result in adverse patients outcomes, increased length of stay, increased hospital cost, and antimicrobial resistance. Literature suggests that initiation of microbiological assessment prior to antibiotic administration improves patient outcomes. One of the Joint Commission (JC) pneumonia core measures states that blood cultures are to be drawn prior to the
administration of antibiotics in the ED. To improve compliance with JC mandates, University Medical Center of Southern Nevada (UMCSN) implemented a policy on May 15, 2012 to place culture alert stickers (CAS) on specific antibiotics used in the ED for the treatment of Community Acquired Pneumonia as a reminder to draw blood cultures. Reminding ED staff of the need to obtain blood cultures prior to administration of antibiotics should increase compliance with JC mandates. The primary goal of this study was to investigate whether or not the CAS protocol impacted the rate of blood cultures collected prior to antibiotic administration.

Methods: After implementation of the CAS protocol, a retrospective two week pre- and post- analysis was conducted to evaluate the effectiveness of the policy. A two week washout period was utilized as an attempt to control for heighten awareness of the new policy and other confounding variables. All patients administered at least one protocol antibiotic were evaluated to see if blood cultures were drawn prior to the administration of the medication. Inclusion criteria was age ≥18 years, hospital admission through the ED and administration of ≥1 dose of a protocol antibiotic. Patients were excluded if they had a history of a prior infection and/ or any systemic antibiotic within the past 30 days. Additionally, patients were evaluated to determine if the blood cultures provided the opportunity for, or resulted in proper antibiotic de-escalation. The primary objective was to evaluate compliance of obtaining blood cultures prior to antibiotic administration. Secondary outcomes include the impact of CAS on hospital length of stay, opportunity and rate of de-escalation, death from any cause, and number of documented adverse drug events.

Results and Conclusions: To be presented

ACPE #:0126-9999-13-393-L01-P

Learning Objectives:
- Explain the importance of time to antibiotic administration in relation to blood cultures.
- Discuss the effect of simple procedures for increasing compliance of JC mandates.


384 - EFFECT OF AN ELECTRONIC PATH

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 3:30 PM in Dockside

Introduction
The guidelines for the treatment of sepsis recommend multiple interventions and therapies that have demonstrated positive effects on mortality. Effective antimicrobial administration within the first few hours of sepsis identification is associated with increased survival, while each hour of delay is associated with increased mortality. The practice of initiating antimicrobial(s) directed against the most likely pathogen(s) reduces the risks associated with ineffective treatment and decreases development of resistance to overused broad-spectrum antimicrobials. An electronic pathway that provided appropriate antimicrobial options based on evidence-based medicine was utilized to assist providers in selecting appropriate antimicrobial therapy for the prompt treatment of patients with sepsis. The primary intent of the study was to compare the selection of appropriate antimicrobial therapy when an electronically driven pathway was utilized versus prior to its implementation.
Methods
The electronic sepsis pathway included alerts to notify predefined critical action teams of patients with potential sepsis. Patients were identified via the electronic medical record (EMR) system as meeting systemic inflammatory response system (SIRS) criteria. Any patient meeting SIRS criteria in the EMR activated an alert to the designated critical action team who then evaluated patients and initiated the electronic sepsis pathway as indicated. This electronic pathway guides antibiotic therapy based on a known or suspected source of infection. Historical control data was collected from November 2011 through March 2012. The control data was compared with data collected during the intervention period from November 2012 through March 2013. Patients ≥18 years of age with a sepsis diagnosis identified by medical records or system alerts in the prospective group (confirmed by chart review to meet sepsis criteria) and who received at least 72 hours of consecutive antimicrobial therapy during hospitalization were eligible for inclusion. Patients were excluded if transferred from another institution in which they received antimicrobials. Appropriate antimicrobial selection was defined as the use of the sepsis pathway for antimicrobial selection, selection of antimicrobial therapy based upon internal expert opinion, or adherence to evidence-based medicine guidelines for prospective patients and selection of antimicrobial therapy based upon internal expert opinion or adherence evidence-based medicine guidelines in control patients. Secondary outcomes included in-hospital mortality; 28-day all-cause mortality; 30-day hospital readmissions; antimicrobials given within one hour or three hours of sepsis presentation for patients admitted through the emergency department and inpatients, respectively; length of stay; and intensive care unit length of stay. This study was approved by the Institutional Review Board of Billings.

Results and Conclusions
These will be presented.

ACPE #: 0126-9999-13-394-L01-P
Learning Objectives:
- Explain the effects an electronic pathway for antimicrobial selection on time-to-antimicrobial administration.
- Describe how implementation of an electronic pathway for antimicrobial selection promotes a culture of optimal antimicrobial use.


385 - THE DEVELOPMENT OF AN EXAMINATION PROCESS TO ASSESS THE PROFICIENCIES OF AMBULATORY CARE PHARMACISTS IN THE MANAGEMENT OF DIABETES
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Kristian Navickas, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Sunset IV

Background: In the acquisition of skill, it is thought that learners pass through multiple developmental stages. New learners begin as “novices” and progress to “experts” over time. As a learner passes through these stages, he depends less on abstract principles and concepts and more on concrete experience and an involved...
understanding. A longstanding issue in pharmacy has been determining how to ensure an appropriately skilled clinical pharmacy workforce. Competency statements and examinations (such as board certification) for clinical pharmacists have been in place for many years. Unfortunately, no framework exists for which to measure or assess the skill application of highly experienced, or proficient, clinical pharmacy specialists. The objective of this study was to develop a written examination that appropriately measures the proficiencies of ambulatory care pharmacy specialists in the collaborative management of diabetes in a primary care setting.

Methods: In order to properly identify specific proficiencies, a preliminary survey was distributed to ten ambulatory care clinical pharmacy specialists. This survey was used to determine which specific aspects of diabetes management would be the most useful in assessing the proficiencies of a clinician in the collaborative management of patients in a primary care setting. Ten core-subject areas were agreed to be either “very useful” or “somewhat useful” in the assessment of proficient clinical specialists. After the results were obtained, a written, short-answer exam was created using patient cases and vignettes. The exam will be distributed to ambulatory care specialists for completion. Once completed, assessments will be evaluated and scored based on a standardized scoring tool (to be developed). Knowledge gaps will be identified and further modules will be developed and administered based on success of the initial tool. The primary outcomes to be measured include the perceived usefulness of the individual questions and the exam as a whole in measuring the proficiency of an ambulatory care pharmacy specialist. Other outcomes include the perceived ability of the exam to appropriately identify knowledge gaps and also integrate knowledge and clinical practice. The outcomes will be achieved by utilizing a post-exam survey. Results and conclusions will be presented.

ACPE #:0126-9999-13-395-L01-P

Learning Objectives:
1) Discuss the major differences between “competencies” and “proficiencies” in the setting of ambulatory care pharmacy.
2) Explain the benefit of a written examination in the assessment of a proficient ambulatory care pharmacist.


386 - CONTINUOUS INFUSION VS. INTERMITTENT BOLUS FOR FENTANYL VS. MORPHINE FOR POST-OPERATIVE PAIN CONTROL IN NEONATES
B6. Pediatric or Gender Specific Care

Presented by:
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Presenting on Wednesday, May 15 at 10:00 AM in Sunset II

Introduction:
Postoperative neonates are often treated with opioid analgesics for pain control, most commonly, morphine and fentanyl. However, there are limited studies evaluating postoperative pain control in neonates. Studies have compared continuous infusion versus intermittent bolus of morphine or fentanyl, respectively. Limitations of these past studies include small sample size and lack of comparison between agents (i.e., morphine vs. fentanyl). Data regarding the safety and efficacy of postoperative analgesic regimens, including comparison of
morphine and fentanyl, neonates is therefore limited. The purpose of this study is to compare continuous infusion versus intermittent bolus of fentanyl versus morphine for pain control in post-operative neonates.

Methodology:
This is a retrospective, matched case control study of postoperative neonates admitted to an academic medical center Level III NICU between September 1, 2010 – September 1, 2012 receiving either continuous infusion or intermittent bolus of either fentanyl or morphine for pain control. Neonates who received pre-operative or prenatal exposure to opiates or those that received concomitant analgesics other than morphine or fentanyl will be excluded. Data collection will include demographics, analgesic dosing information (drug, dose regimen, and total daily dose), need for additional analgesic boluses, Premature Infant Pain Profile (PIPP) scores, oxygen saturations, respiratory rate, PCO2, incidence of apnea, and need for increased oxygen and/or ventilatory requirements. Descriptive and inferential statistical analyses to evaluate pain scores, total dose by body weight, and incidence of respiratory complications will be completed using STATA version 11.2.

Results:
Data collection is ongoing and analyses pending. Results will be presented.

Conclusion:
Conclusion(s) will be presented.

ACPE #:0126-9999-13-396-L01-P

Learning Objectives:
1. Describe possible treatment strategies to control pain in postoperative neonates.
2. Explain the efficacy and safety of intermittent versus continuous morphine or fentanyl for the treatment of postoperative pain in neonates.


387 - EVALUATION OF DEXMEDETOMIDINE USE IN THE INTENSIVE-CARE UNIT (ICU)

B3. Critical Care

Presented by:

Brian Nelson, PharmD
UC San Diego Health System
b3nelson@ucsd.edu

Presenting on Wednesday, May 15 at 4:00 PM in Executive 715

Background: Dexmedetomidine is an attractive sedative agent, commonly used in most ICU settings. Several clinical trials have demonstrated beneficial qualities of dexmedetomidine compared to other sedatives infusions (i.e. propofol, lorazepam and midazolam) including decreased length of stay in the ICU, decreased time on the ventilator and less progression to ICU delirium. Despite its many proposed benefits, dexmedetomidine is an expensive medication and is often a top ICU expense. Some studies have shown that the increased cost of this medication may be attenuated by a reduction in days on ventilation and length of stay in the ICU.

Objective: To retrospectively evaluate the ICU length of stay in patients receiving dexmedetomidine compared to those receiving other sedative agents in UCSD Health System ICUs.

Methodology: This is a retrospective, observational study including all ICU patients from June 1, 2011 through June 30, 2012 who receive dexmedetomidine with or without other sedative infusions. This group will be compared to a randomly selected group, managed exclusively with other sedative infusions. Major data points to be evaluated will include: admission diagnosis, primary service, RASS score, CAM-ICU, indication and dose for
dexmedetomidine, use of other sedative/analgesic medications, ICU and hospital length of stay, duration of mechanical ventilation, drug costs, spontaneous breathing trials, extubation patterns, vital signs (HR, BP) and APACHE-II scores.

Results and Conclusions: to be presented

ACPE #:0126-9999-13-397-L01-P
Learning Objectives:
1. Describe the effect of dexmedetomidine, compared to historical sedation, on ICU length of stay
2. Describe the effect of dexmedetomidine on ventilator days, delirium and overall hospital costs


388 - COMPARISON OF OUTCOMES IN PHARMACIST VERSUS NON-PHARMACIST ASSISTED MANAGEMENT OF HIV-INFECTED PATIENTS

B1. Ambulatory Care

Presented by:
Ofir Noah Nevo, PharmD
University of California San Diego
onevo@ucsd.edu

Presenting on Wednesday, May 15 at 10:30 AM in Bay View

Several studies have examined the impact of pharmacist interventions on treatment of HIV-infected patients, with many studies focusing on improving adherence in non-adherent patients. The aim of this study is to investigate the impact of pharmacist-assisted (PA) management of antiretroviral therapy (ART) in treatment-naïve HIV-infected patients under a collaborative practice protocol. Further insight into how pharmacists can improve ART outcomes may help improve overall HIV management. This is particularly critical in the context of a growing number of HIV-infected individuals, earlier initiation of treatment, the increasing variety and complexity of ARV regimens, and the shortage of HIV providers in certain regions. The findings in this study will add to the growing body of evidence on how pharmacists contribute as part of a multidisciplinary HIV care team.

The UCSD Medical Center Owen Clinic is an HIV primary care clinic in which certain patients are referred to pharmacists for ART management. This is a retrospective, observational, cohort study of treatment-naïve HIV positive patients who were initiated on ART between July 2003 and December 2011. The primary endpoint is to evaluate the difference in rates of achieving undetectable HIV viral load in patients who had PA management versus non-PA management of ART. Data analysis is currently ongoing and conclusions pending data analysis.

ACPE #:0126-9999-13-398-L02-P
Learning Objectives:
1. Discuss the clinical impact of pharmacist-assisted management of antiretroviral treatment in terms of viral load suppression rates, changes in CD4 counts, and all-cause mortality
2. Discuss the benefits of pharmacist-physician collaborative care practice protocols in providing care to HIV patients in a primary care clinic setting

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389 - EUREKA! USE OF MEDMINED® TO REDUCE THE RATES OF CLOSTRIDIUM DIFFICILE INFECTIONS
B4. General Clinical Practice

Presented by:

Raymond Ngo, PharmD
Kaiser Permanente Medical Care Program - Orange County
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Presenting on Wednesday, May 15 at 2:00 PM in Royal II

Clostridium difficile is a common bacterial cause of diarrhea in healthcare settings and can significantly impact patient morbidity and mortality. Currently, the Centers for Medicare and Medicaid Services are evaluating hospital-acquired Clostridium difficile infections as a non-reimbursable, preventable hospital event. In 2011, the California Department of Public Health reported Clostridium difficile infections at an incidence rate of 7.0 and 9.4 per 10,000 patient days in new hospital onset and hospital-associated events in general acute care hospitals, respectively. Comparatively, from the period of November 2011 to March 2012, the hospital-associated incidence rate of Clostridium difficile infections was 29.6 per 10,000 inpatient days in the Kaiser Permanente Orange County Medical Center. The United States Health and Human Services Department has implemented a nationwide goal of decreasing the 5-year hospital-associated Clostridium difficile infection rate by 30% by 2013 for all hospitals. Preventable risk factors for Clostridium difficile infection include the overuse of broad-spectrum antibiotics and concurrent use with proton pump inhibitor therapy. The study objective is to evaluate the effect of Medmined-generated reports with a pharmacist review process for physicians with high levels of broad-spectrum antibiotic prescribing to reduce the rate of Clostridium difficile infections.

Medmined is a web-based data mining program capable of providing objective data for hospital-wide antibiotic surveillance and analysis. For this study, monthly physician antimicrobial usage patterns will be identified via Medmined Days of Therapy (DOT) reports run according to antibiotic class (e.g.: fluoroquinolones, third generation cephalosporins, and piperacillin/tazobactam). A sampling of the top 10% of prescribing physicians according to DOT/1000 patient days will be reviewed for appropriateness of antibiotic therapy. Pharmacists will review antibiotic prescribing according to these criteria: 1) if the correct empiric therapy was chosen according to Kaiser Permanente Regional Empiric Therapy Guidelines, 2) if culture and sensitivity testing was done and with proper de-escalation, if indicated, 3) if dosing was appropriate, 4) if therapy was not duplicative in spectrum with other antibiotics, and 5) if there was concurrent proton pump inhibitor therapy. Peer comparison reports on physicians with higher incidences of inappropriate prescribing will be provided to physician Chiefs of Service for further academic detailing and discussion. Clostridium difficile infection rates will be obtained from Medmined for the period of the pharmacist review process from November 2012 to March 2013. This will be compared to baseline Clostridium difficile rate from the same time frame of the previous year. Results and conclusions of the study will be presented upon the completion of the study.

ACPE #:0126-9999-13-399-L01-P
Learning Objectives:
- Describe the consequences of Clostridium difficile infections (CDI).
- Explain how the inappropriate prescribing of broad-spectrum antibiotics is a preventable risk factor for hospital-acquired Clostridium difficile infections.

INTRODUCTION:
During an inpatient stay at an acute care institution, a patient often undergoes several transitions of care, such as admission from the emergency department, transfer, and hospital discharge. These transition points have the highest potential for adverse drug events or medication errors due to discrepancies in the patients’ medication history, which may negatively impact the patients’ outcome and potentially increase hospital costs. The role of a pharmacy technician may be expanded to help with the first step of the medication reconciliation process. A potential role of technicians in this process involves initiating and creating a medication history for patients under the oversight of a supervising pharmacist. Other institutions have begun incorporating a technician in the inpatient admissions department to reduce potential adverse drug events and medication errors during the processing of outpatient medication lists to active inpatient orders. The primary objective for this study was to determine the difference in accuracy between nursing-initiated medication histories and pharmacy-initiated medication histories. Secondary objectives were to identify the types of the errors made by nurses and pharmacy, and the potential cost benefit of having a pharmacy technician initiate the medication history process.

METHODS: This study was a retrospective, single-center, non-randomized, cohort study of patients admitted to the general medicine 5th floor unit of Long Beach Memorial during the period of October 1, 2012 to January 31, 2013. Patients were included if they are greater than 18 years of age, able to communicate, and have their medication histories completed by both an RN and pharmacy technician independently. Discrepancies in the medication histories between the nurse and the pharmacy technician were documented and evaluated for potential medication error or adverse drug event. To assess cost benefit, the study evaluated the time it takes for a pharmacy technician and pharmacist to complete a medication history per patient, the time it takes for a nursing staff member to complete a medication history per patient, and determined the net benefit of preventing potential medication errors or adverse drug event.

RESULTS: to be presented

CONCLUSIONS: to be presented

ACPE #:0126-9999-13-400-L05-P
Learning Objectives:
1. Describe the difference between medication history and medication reconciliation
2. List the benefits of having a pharmacy technician responsible for documenting patients’ medication histories

BACKGROUND:
Heart failure (HF) is a chronic disease characterized by high mortality, frequent hospitalization due to acute exacerbations, poor quality of life, and a complex medication regimen. HF patients are associated with an increase in healthcare expenditures. Pharmacists in the setting of chronic disease management uniquely optimize medication regimens, provide medication reconciliation, assess for medication adherence, and provide patient education. Under a prescribing protocol and collaborative practice agreement, pharmacists working on an interdisciplinary team can optimize heart failure medication regimens and make early interventions that prevent a HF exacerbation. Studies have shown the positive impact of a pharmacist in an interdisciplinary chronic heart failure clinic, which can lead to decreased hospital admissions and emergency room visits, delayed disease progression, and better patient outcomes.

METHODS:
We performed retrospective, descriptive single-center chart review of 46 patients in a chronic disease management HF pilot program managed by a nurse and pharmacist at a UC Davis Primary Care clinic between January 1, 2012 to October 31, 2012, to determine the impact on HF related hospital admissions and ED visits. Patients were referred by either: 1) patient’s PCP (PCP-R), or 2) hospital HF transitions of care team (TOCH-R). Based on inclusion/exclusion criteria, 39 of the 46 referred patients were included in the analysis. Patients were compared to a control based on their type of referral: 1) PCP-R patients were compared to themselves in the previous year, during a matched time frame 2) TOCH-R patients were compared to a case-control matched for age, gender, ethnicity, type of HF, co-morbidities, and season of HF admission. Additionally, we evaluated the number of medication interventions that occurred, change in NYHA functional classification, and physician and patient satisfaction of the HF care management model at the end of the pilot.

RESULTS:
For the 39 patients included in the analysis, there were 486 patient encounters: 77 face-to-face contacts, 402 telephone encounters, and 7 email communications. A medication change by the nurse/pharmacist team occurred 174 times; 67% of the patients had ≥1 medication change. A medication adherence intervention was made 81 times. Average time to first contact with a healthcare professional after discharge was 2.6 days, compared to 4.8 days for the control group. The average NYHA functional classification improved from baseline (median 3, mean 2.425) to the end of the pilot (median 2, mean 1.975). One of the 14 (7%) TOCH-R had a HF related readmission within 30 days of index HF admission. Of the 25 PCP-R, 0/25 (0%) were admitted for HF. There were no HF-related ED visits during the pilot for the 39 patients included in the analysis. Patient and physician surveys demonstrated satisfaction with the program.

CONCLUSIONS:
A HF nurse and pharmacist working collaboratively under a prescribing protocol can decrease HF-related readmission and ED visits and improve patients' functional status. The nurse/pharmacist HF team provided close follow-up, patient education, and medication interventions.
Learning Objectives:
- Describe the role of a pharmacist under a collaborative practice agreement in a multi-disciplinary heart failure team in the ambulatory care setting.
- Explain the impact on the NYHA functional classification for patients entering intensive care coordination.


392 - CORRELATING PROCALCITONIN VALUES WITH POSITIVE BLOOD CULTURES
A1. Infectious Disease - Anti-infective Agents

Presented by:
Phuong-Lien Nguyen, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Dockside

Purpose: Despite interventions, blood culture contamination rates from MultiCare Good Samaritan Hospital’s emergency department (ED) continue to fluctuate. Procalcitonin is a promising marker for infection and has been used to guide the discontinuation of antimicrobial therapy. This study will assess the predictive value of procalcitonin in distinguishing bacteremia from blood culture contamination. It will also assess trends in procalcitonin values in patients with positive blood cultures. Results will determine the suitability of procalcitonin as a tool for evaluating new positive blood cultures and promoting judicious antimicrobial use at our institution.

Methodology: Patients admitted from the ED with blood culture orders will have a procalcitonin level drawn concurrently. The following data will be collected: patient history, presentation, risk factors, vitals, creatinine clearance, and antibiotic regimens. A minimum one month data review with an infectious disease pharmacist and physician will consider patient history, presentation, risk factors, and lab values to support true bacteremia and determine if procalcitonin levels predicted bacteremia when corresponding blood cultures were positive. This is an institutional quality improvement project and is exempt from Institutional Review Board approval.

Results and Conclusions: Results and conclusions will be discussed.

ACPE #:0126-9999-13-402-L01-P
Learning Objectives:
- Explain how procalcitonin serves as a biomarker for systemic infection.
- Explain how procalcitonin can help differentiate true bacteremia from blood culture contamination.


393 - IMPLEMENTING CLINICAL DECISION SUPPORT – MEDICATION DOSING IN RENAL IMPAIRMENT
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
Truong Nguyen, PharmD  
University of Utah Hospitals and Clinics - Pharmacy Informatics  
truong.nguyen@hsc.utah.edu

Presenting on Wednesday, May 15 at 8:30 AM in Palm II

Introduction:
Medication errors are a common preventable problem where roughly 2.9 to 3.7 percent of hospitalizations will have an error occur. Patients who are admitted to the hospital with reduced renal function or an acute kidney injury are at greater risk for a medication error. A recent analysis of adverse drug events (ADEs) in six community hospitals showed that of the potential ADEs, nearly all could have been prevented by a decision support system with renal dose checking. Additionally, several studies have shown that clinical decision support (CDS) with renal dose checking improves the rate of appropriate ordering of medications, decreases the likelihood of serious medication errors, and can have up to a reported annual $2.24 million cost savings. 
The University of Utah Hospitals and Clinics use a CPOE system that allows for CDS rules to be highly customized. This is a quality improvement, descriptive study designed to evaluate the implementation of clinical decision support rules to encourage appropriate ordering of medications in the setting of renal impairment.

Methodology:
The primary outcome of this study is the number of appropriately ordered medications for both dose and frequency after receiving the CDS alert. Secondary outcomes that will be assessed are the number of inappropriate doses administered, rate of provider compliance with the alerts, reasons for noncompliance, and trends in overrides.
The medications selected for the new CDS alerts and proposed alert-triggers are based on University of Utah Health Care (UUHC) Pharmacy and Therapeutics Committee (P&T) approved renal dosage adjustment and anticoagulant guidelines. The renal dose alerts are triggered for all patients older than eighteen years old and who are admitted to one of the following care areas: acute internal medicine (AIMA & AIMB), cardiovascular medicine (CVMU), rehab-II (IMR), ortho-trauma (OTSS), surgical specialty and transplant (SSTU). Renal function will be based on creatinine clearance calculated by the hospital information system (HIS). The alerts are designed not to fire for patients diagnosed with cystic fibrosis, on dialysis (antibiotics only), or who do not have enough information to calculate a creatinine clearance. Data from the first 30 days of implementation will be collected for the study results. Control data will be retrieved from the data warehouse for the same dates from the previous year to compare. All data will be analyzed with the appropriate statistical analysis for their data-type.

Results and conclusions will be presented based on final data review.

ACPE #:0126-9999-13-403-L01-P
Learning Objectives:
- Explain the role that clinical decision support alerts can have on patient safety
- Describe the difficulties of implementing meaningful clinical alerts


394 - OPTIMIZATION OF MEDICATION ALERTS IN AN ACADEMIC MEDICAL CENTER
D1. Medication Safety

Presented by:
Introduction: Medication alerts are a valuable clinical decision support tool for providers and pharmacists during the prescribing and verification step of the medication use process. They provide additional layers for patient safety that result in reduction of errors and prevention of adverse effects. However, medication alerts are not without barriers to its effectiveness. There is the risk for desensitization to alerts or “alert fatigue.”

The University of California, San Francisco Medical Center (UCSFMC) implemented CPOE and BCMA with the deployment of Epic in 2012, utilizing First DataBank (FDB) as the medication knowledge-base vendor. Within Epic, pharmacists and providers have different medication alert settings. There is an opportunity through Epic and FDB to better customize alerts to improve the overall effectiveness of alerts.

Methodology: This study is a prospective study by which the volume and acceptance rates of medication alerts will be measured approximately 6 months post go-live. Modifications to specific alerts will be made and alert volume and acceptance rates will be re-measured.

Results: Baseline characteristics of December 2012 data saw there were a total of 187,764 alerts for 303,891 medication orders. Pharmacists received 163,736 alerts of which 34% were duplicate therapy, 21% were drug-allergy, 18% were dose range checking, and 17% duplicate medication. This study targets two types of alerts to reduce for pharmacists. In the drug-allergy category, the study will look at inactive ingredient allergies alerting against products that have yet to be reviewed by the knowledgebase vendor. This type of alert made up approximately 80% of all drug-allergy alerts and the acceptance rate was 3.5%. The second type of alert targeted is duplicate therapy alerts, particularly, parenteral products containing sodium. This alert was 11% of the total duplicate therapy alerts and had a 2% acceptance rate.

Providers saw 23,052 alerts in same time period with the majority being dose range checking (63%) and drug allergy (32%). This study will target and minimize dose range check alerts for providers. The major alert for dose range check was the order for glucose chewable tablet given as needed which made up 7% of the dose range check alerts and was accepted 1% of the time by providers. The alert for this type of order warns that the daily dose was exceeded and frequency exceeded. However, this alert is not appropriate since the medication is given on an as needed basis and not around the clock. The three types of alerts that this study will target have minimal clinical impact but are contributing to a significant amount of “noise” alerts. Appropriate changes will be made to suppress the alerts and the impact of these changes will be measured.

Final Results and Conclusions: To be presented

ACPE #:0126-9999-13-404-L01-P

Learning Objectives:
1. Describe the concept of clinical decision support during the prescribing step of the medication use process
2. Describe strategies to improve clinical decision support and minimize alert fatigue

Presented by:

Ruthie Nguyen, PharmD  
Asante Rogue Regional Medical Center  
ruthie.nguyen@asante.org  

Presenting on Wednesday, May 15 at 4:30 PM in Royal II  

INTRODUCTION  
Readmissions can have costly effects on hospitals. Out of the $700 billion used annually on wasteful healthcare spending, $25 billion is representative of preventable hospital readmissions. In 2004, Medicare spent $17.4 billion in unplanned readmissions costs. Twenty percent of 12 million Medicare beneficiaries were re-hospitalized within 30 days of discharge. The Centers for Medicare and Medicaid Services (CMS) have identified several conditions that are commonly associated with 30-day readmissions rates which include heart failure, acute myocardial infarct, and pneumonia. In response to the readmission dilemma, the Federal Hospital Readmission Reduction Program was included in the Affordable Care Act. The program requires CMS to reduce payments to hospitals, including RRMC, with excess readmissions after October 1st, 2012. In order to improve quality of care, this project will implement a pharmacist-managed pre-discharge medication education program for patients diagnosed with pneumonia. The primary objective is to reduce 30-day pneumonia readmission rates. The secondary objective is to improve patient satisfaction.

METHODOLOGY  
This retrospective, non-randomized, institutional review board study will include patients who are diagnosed with pneumonia of any cause, those residing in the general medicine unit of the hospital, and those who are 18 years of age or older. There will be no gender or ethnicity bias. Data to be collected will include patient age, gender, and antibiotic regimen. The data will be recorded without patient identifiers and held confidential. The team will be comprised of clinical pharmacists and student pharmacists assigned to the general medicine floor. Prior to discharge, these clinical pharmacists or student pharmacists will counsel patients about pneumonia and the antibiotics that the patients are receiving for pneumonia. Patients will receive a one-page pneumonia educational summary and a patient satisfaction survey. This service will be offered Monday through Friday from 0700 to 1700. Once discharged, a follow-up case review will be initiated at day 30 to determine if the patient has been readmitted.

RESULTS and CONCLUSION  
The findings of this study will be presented.

ACPE #:0126-9999-13-405-L01-P
Learning Objectives:
- Describe the need to decrease 30-day readmission rates
- Explain the benefits of implementing a pharmacist-managed pre-discharge medication education program for pneumonia patients

INTRODUCTION

This is the continuation of a performance improvement (PI) project initiated by last year’s rural health pharmacy resident. The goal of the project is to expand healthcare access to rural veterans through nationally funded technology. Providing high quality health care to patients in rural areas can often be a challenge due to access limitations. Clinical Video Telehealth (CVT) is new video technology that will allow patients to have real-time face to face interaction with a provider without either of them having to travel long distances. The objective of the project is to evaluate the effectiveness of a PI initiative utilizing pharmacist-led disease state management clinics via CVT. These clinics will manage chronic disease states such as diabetes, hypertension, and dyslipidemia under the VA Sierra Nevada Health Care System pharmacy scope of practice.

METHODOLOGY

The VA’s clinical performance dashboard will be utilized as intended and approved to identify patients within the VA Sierra Nevada Health Care System who have not met therapeutic goals for diabetes, hypertension, and dyslipidemia. The dashboard is yet another PI that has become a standard of care in providing population based care to the Veterans we serve. Patients will be excluded from the PI project if they are unable to speak English, unwilling to participate in a CVT clinic or unable to drive to their nearest VA clinics. All participants that qualify will be scheduled for a thirty minute CVT clinic appointment at the Winnemucca, NV or Susanville, CA VA outreach clinic. A coordinating CVT appointment will be made for the pharmacy resident at the Fallon VA clinic. The rural health resident will collaborate with registered nurses in Winnemucca and Susanville who will perform and document vital signs and assist with operating the CVT equipment. The resident, while in Fallon, will make an assessment based on subjective and objective data, make changes and recommendations in pharmacotherapy as appropriate and provide education to the patients in order to help these patients reach therapeutic goals. Outcomes will be identified and evaluated to determine the success of the PI project as an operations need of the facility. The primary outcome will be the percentage of patients that achieve chronic disease state management goals assessed through HgA1c, LDL, and blood pressure measures. Secondary outcomes will include percentage change from baseline and time to reach goal.

RESULTS AND CONCLUSIONS

Results and conclusions will be presented at Western State Conference

ACPE #:0126-9999-13-406-L01-P

Learning Objectives:
1. Explain how VA technology including the Clinical Dashboard and CVT positively affects the care of our Veterans
2. Name at least three disease states that can be managed with the use of CVT technology


397 - INTEGRATED HEPATITIS C TREATMENT THERAPY APPROACH IN A VETERANS AFFAIRS MEDICAL CENTER

A1. Infectious Disease - Anti-infective Agents

Presented by:
Kim Chi Nguyen, PharmD  
VA Sierra Nevada Health Care System  
kimchi.nguyen@va.gov

**Presenting on Wednesday, May 15 at 4:00 PM in Dockside**

**Introduction:**
Hepatitis C (HCV), is a disease with 17,000 Americans infected annually. Recently, two new oral antiretroviral (AVR) agents have been added to the traditional regimen, peginterferon plus ribavirin for genotype 1. Prior to these additions, the rate of sustained virologic response (SVR) post treatment was 21-44%; now increased to 59-88% with triple AVR. Although inspiring, there are increased risks, adherence burden, and monitoring requirements. To successfully manage patients under care, we are proposing a performance improvement (PI) project as an integrated treatment model incorporating services from physicians/nurse practitioners, mental health providers, and pharmacy to improve outcomes in the veteran’s population at VA Sierra Nevada Health Care System.

**Methodology:**
In accordance with the PI and newly developing standards of care, patients with genotype 1 HCV who are currently receiving therapy or initiated on triple ARV therapy will be enrolled as part of the integrated hepatitis C treatment model. The model will consist of physician/nurse practitioner initial assessment and follow up, a mental health evaluation prior to initiation of treatment in appropriate patients, a monthly hepatitis C support group that ensures the stability of veterans’ psychological status during treatment, pharmacy intervention with initial drug therapy education classes prior to starting therapy, drug monitoring, monthly follow up appointment, and dosage adjustments or adding adjuvant therapy to treat side effects (blood dyscrasias, fatigue, rash, nausea, and vomiting). Veterans are to be followed until end of treatment duration at which point primary and secondary outcomes will be reported in comparison with current published data. End treatment response (ETR) and SVR will be recorded to assess primary outcomes. Adverse effects, completion/discontinuation rates, vaccination rate, dosage reductions, and use of erythropoietin stimulating agent (ESA) will be monitored and documented throughout the study to evaluate secondary endpoints. Conclusion of this project will yield analysis of performance improvement with the integrated treatment approach as an operations evaluation for our facility.

**Results and conclusions:** Results and conclusions are pending and will be discussed.

**ACPE #:** 0126-9999-13-407-L01-P

**Learning Objectives:**
- Discuss potential side effects associated with triple antiretroviral therapy and their management.
- Identify characteristics that contribute to triple antiretroviral therapy discontinuation or failure in hepatitis C genotype 1 patients.


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**398 - IMPROVING POST-HOSPITAL TRANSITIONS OF CARE: A PATIENT-CENTERED APPROACH TO MEDICATION REVIEWS**

**B4. General Clinical Practice**

**Presented by:**

Belinda Nguyen, PharmD  
Palomar Medical Center
Patients that are transitioned from hospital to home are at high risk for medication discrepancies and adverse drug reactions that can result in re-hospitalization. The objectives of this study were to improve patient transitions of care by performing patient-centered medication reviews and to evaluate efficient methods of communication with primary care providers. Through November 19th, 2012 to February 1st, 2013, 30 patients were identified using Palomar Health’s electronic health record system. Of these 30 patients, informed consent was obtained from 23 patients. Inclusion criteria included patients admitted through the emergency department, patients with a primary care provider affiliated with Palomar Health’s medical group, Arch Health Partners, and patients who were on one or more over-the-counter or prescription medications. Patients were excluded if they were admitted secondary to drug/alcohol abuse or myelosuppression from chemotherapeutics, were less than 18 years of age, were obstetric patients, and were unable to provide an accurate medication history. Each patient’s medications were evaluated based on the STOPP/START criteria, Beers criteria, and the antithrombotic monitoring guidelines established at Palomar Health. A patient-centered pharmacotherapy review was done if a patient was on medications that did not fall into either of these categories. The first 4 interventions were reviewed with the Medical Director of Arch Health Partners to establish the method of how providers would be contacted. The goal was to have each intervention tailored to the actual clinical needs of patients in the outpatient setting and to reduce task fatigue from providers. Each clinically significant drug therapy issue or medication discrepancy was electronically communicated to the patient’s provider through NextGen, the electronic health system used by Arch Health Partners. Relevant therapeutic recommendations were also included in the communications sent to providers. The primary endpoints of this study were provider response and acceptance rates of drug therapy interventions. Secondary endpoints included occurrence of drug-related hospitalizations and the clinical significance of interventions made. The results and conclusion of this study will be discussed.

ACPE #:0126-9999-13-408-L01-P
Learning Objectives:
- Describe the common drug therapy issues identified through patient-centered medication reviews based on general or patient-specific guidelines.
- Describe and identify the most efficient methods of communication with outpatient primary care providers.


399 - EVALUATION OF A STEP-WISE PROTOCOL IN REDUCING ALBUMIN USAGE IN INTRADIALYTIC HYPOTENSION
B4. General Clinical Practice

Presented by:

**Tammie Minh Tam Nguyen, PharmD**
Fountain Valley Regional Hospital
[temmie.nguyen@tenethealth.com](mailto:temmie.nguyen@tenethealth.com)

*Presenting on Wednesday, May 15 at 5:00 PM in Royal II*
Introduction:
Intradialytic hypotension (IDH) occurs in about 25% of patients undergoing hemodialysis. According to National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF KDOQI), symptomatic intradialytic hypotension (IDH) is defined as a decrease in systolic blood pressure by ≥20 mmHg or a decrease in mean arterial pressure (MAP) by ≥10 mmHg associated with symptoms that include abdominal discomfort, nausea, vomiting, muscle cramps, restlessness, dizziness or fainting, and anxiety.
IDH can be managed through use of intravenous fluids such as normal saline, human albumin, and hetastarch. Previous studies, which looked at the efficacy of albumin in IDH, revealed no additional benefits in the use of albumin over normal saline. However, albumin usage remained high in dialysis patients at our institution, despite its high cost. In March 2012, we implemented a step-wise protocol to streamline and reduce albumin usage during dialysis sessions.

Method:
The objective of this study is to assess the need to revise the protocol to further reduce albumin use. The study is a retrospective chart review to evaluate effectiveness of the step-wise protocol. The primary end point is albumin usage after implementation of the step-wise protocol. The secondary end points are (1) whether normal saline was given before proceeding to albumin, and (2) blood pressure parameters at which albumin was given.

Results and Conclusion:
Data collection and analysis will be conducted, and results and conclusions will be presented.

ACPE #:0126-9999-13-409-L01-P
Learning Objectives:
- Describe intradialytic hypotension and options for management
- Describe effectiveness of a step-wise protocol in reducing the use of albumin in intradialytic hypotension


400 - IDENTIFYING PERCEIVED BARRIERS TO VACCINATION FOR WOMEN’S CANCER PREVENTION IN NIGERIA
B4. General Clinical Practice

Presented by:
Nicole Y. Nguyen, PharmD
University of California, San Francisco
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Presenting on Wednesday, May 15 at 4:00 PM in Royal II

Introduction:
Cervical cancer is ranked as the second most frequent cancer among women in Nigeria and in 2011 Nigeria implemented a national strategy to reduce the mortality associated with cervical cancer, demonstrating that this has been identified locally as a key health concern.
Vaccination with Human Papillomavirus (HPV) vaccine is one the primary strategies for prevention of cervical cancer. Bivalent HPV vaccine (Cervarix) is currently licensed in Nigeria and there have been efforts to increase access through negotiations with drug manufacturers and the Global Alliance for Vaccines and Immunization (GAVI). However, the vaccine has yet to be incorporated into widespread use.
The current study investigates perceived barriers to HPV vaccination in a Nigerian community, targeting health professionals’ perceptions.

Methodology:
This project has three phases; (1) October/November 2012 - comprehensive literature review focused on attitudes toward HPV vaccination in developing countries (2) January 2013 - pilot study to refine the instrumentation and (3) March/April 2013 - administration of the finalized needs assessment capturing responses from a cross-sectional sample of health professionals in and near Adazi Ani in Anambra State, Nigeria. The final needs assessment tool is grounded in the Theory of Planned Behavior, informed by literature review/pilot study and inclusive of several validated scales. This study qualifies as exempt from full review by the Institutional Review Board.

Preliminary Results:
Responses to the 70-item pilot survey were collected from 22 Nigerian health professionals; 45% were nurses, 36% physicians and 18% pharmacists. The majority of responders were female (64%), identified as having Christian religious beliefs (100%), and were working in urban settings (91%) for public institutions (95%). Most health professionals (68%) had not participated in any training for general vaccine administration, and of those who did none were trained specifically for HPV vaccinations. Baseline knowledge responses regarding HPV and correct vaccine administration were found to be inconsistent and lacking.

Although there was variability in the percentage of eligible patients, only 14% of responders have ever administered the HPV vaccine. Only 36% said that HPV vaccine is available in Nigeria, while only one responder agreed that they have access to the HPV vaccine. Responders identified availability to the vaccine as the primary factor making it difficult or impossible to recommend and administer the HPV vaccine. Other barriers identified in this study include awareness and lack of education to providers and the public regarding HPV and prevention of cervical cancer. Patient acceptability of HPV vaccine and cost were also concerns of the health professionals in this study.

Conclusions:
Perceived barriers to cervical cancer prevention through HPV vaccination that were identified by Nigerian health professionals in this study include vaccine availability, accessibility, cost, and acceptability. Ongoing efforts to subsidize vaccine costs and interventions that increase awareness of HPV vaccine and attainability of vaccine could improve the rates of administration in Nigeria, and ultimately improve cervical cancer prevention in this population.

ACPE #:0126-9999-13-410-L01-P
Learning Objectives:
- List the barriers identified in this study that make it difficult for health professionals in Nigeria to recommend and administer the HPV vaccine.
- Describe strategies that may help overcome the perceived barriers to vaccination with HPV vaccine in Nigeria.


401 - THE RELATION OF PHARMACY CARE TO INPATIENT GLYCEMIC CONTROL AT A LARGE ACADEMIC MEDICAL CENTER
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Cynthia Nguyen, PharmD
University of California, San Francisco Medical Center
Hyperglycemia has been associated with poor outcomes in several large studies. Repeated or prolonged hyperglycemia increases the risk of adverse outcomes including decreased immune function, increased length of hospital stay, and overall mortality in various populations. Suspension of oral diabetic agents along with potential insulin resistance due to acute illness often leave patients without proper blood glucose control in the hospital. Insulin is the preferred medication for glycemic control among most inpatients. Though not always appropriate, sliding scale insulin regimens without any intermediate or long-acting insulin are often used in hospitalized patients and continued without modification.

The need exists to quickly identify hyperglycemic patients and make appropriate interventions. Optimization of insulin therapy requires careful assessment of multiple patient specific factors including nutritional intake, prior insulin requirement, and other medications. With knowledge of drug therapy, drug preparation and dispensing, pharmacists are well situated to be involved in many different aspects of glycemic control in the inpatient setting. Clinical pharmacist participation on rounds and in the surveillance of prescribing patterns can help reduce errors and optimize blood glucose management.

At UCSF Medical Center, clinical pharmacists routinely monitor blood glucose and make therapy recommendations to providers. However, quantification of these services have not yet been performed. This prospective, observational, cohort study was performed in order to determine if the presence of a dedicated clinical pharmacist impacts glycemic control. Secondary outcomes include determining factors associated with severe hyperglycemic and hypoglycemic events.

One hundred and four surgical patients with persistent hyperglycemia were included in the study. Persistent hyperglycemia was defined as two point-of-care blood glucose values greater than 180 mg/dl within 24 hours. The target blood glucose range was 70-180 mg/dl. Blood glucose management was compared between patients on surgical services with versus without a dedicated clinical pharmacist. Baseline demographic, pharmacist's intervention, and blood glucose data were collected through the electronic medical record for seven days after inclusion.

Descriptive statistics will be used to convey demographic data, blood glucose values, and intervention rates. A two-tailed Chi-squared test will be used to evaluate the association between a having a dedicated pharmacist on service with glycemic control. Univariate and multivariate logistic regression analyses will be performed to identify factors associated with severe hyperglycemia.

Preliminary data show that patients with persistent hyperglycemia on services with a dedicated clinical pharmacist reach average target blood glucose range sooner compared to patients on services without pharmacists (within two days vs. three days after inclusion), despite having more patients receiving tube feeds and systemic corticosteroids in the pharmacist group. Final results from the study will be used to potentially expand and specify services provided by the Department of Pharmacy at UCSF Medical Center.

ACPE #:0126-9999-13-411-L01-P

Learning Objectives:
- Explain the relation of a dedicated clinical pharmacist to glycemic control at University of California, San Francisco (UCSF) Medical Center
- List the factors associated with severe hyperglycemic and hypoglycemic events at UCSF Medical Center

402 - EFFECT OF PHARMACIST INTERVENTION ON POST-DISCHARGE MEDICATION COMPLIANCE AND INCIDENCE OF READMISSION

B4. General Clinical Practice

Presented by:

Frederick Nguyen, PharmD
Arrowhead Regional Medical Center
nguyenfr@armc.sbcounty.gov

Presenting on Wednesday, May 15 at 3:30 PM in Royal II

Hospital readmission rates after discharge with diagnosis of heart failure, myocardial infarction and pneumonia are on the rise. Some of these readmissions are preventable and they serve as a marker of poor health care quality and efficiency. This has prompted the Centers of Medicare and Medicaid Services (CMS) to provide incentives to improve the quality of care by reducing preventable readmissions and penalizing hospitals with high readmission rates. The objective of this study is to evaluate the effect of pharmacist intervention on post-discharge medication compliance and the incidence of readmission in patients with heart failure, myocardial infarction, pneumonia, as well as diabetes. The prospective study is being conducted with patients 18 years and older who were initially admitted into the hospital with at least one of the four aforementioned diagnoses. Patients are counseled on their medications while in the hospital and on the day of discharge, with follow-up telephone calls at days 2 and 14. The following data elements are being collected: patient demographics, admission diagnosis, medications, allergies, dates of intervention, barriers to medication compliance, and current pharmacy use. The effects of pharmacist intervention will be presented, and the implications on the overall cost of care will be discussed.

ACPE #:0126-9999-13-412-L01-P

Learning Objectives:

Describe the impact of pharmacist intervention on post-discharge medication compliance.

Explain how utilization of a pharmacist in the post-discharge process can improve medication compliance.


403 - IPATCH (IMPACT OF PHARMACISTS ACTIVELY TAKING CHARGE OF HYPOGLYCEMIA)

A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Nina Nguyen, PharmD
St. Joseph's Medical Center
nina.nguyen@dignityhealth.org

Presenting on Wednesday, May 15 at 3:00 PM in Mission Bay Foyer

Introduction
The goal of diabetes care is to achieve optimal glycemic control and prevent or delay long-term complications with minimal adverse side effects. Strict blood glucose control is critical for achievements of such goal. Hypoglycemia is sometimes at the expense to achieving goal glycemic control and can contribute to morbidity and mortality to diabetics. Repeated episodes can lead to impaired awareness of low blood glucose and delayed correction of hypoglycemia, which may further increase risk for severe hypoglycemia. Severe hypoglycemia is defined as blood glucose of less than 40mg/dL. Dignity Health corporate goal for severe hypoglycemia is less than 0.35%. Baseline data collection from July 2012 revealed that our institution was not at goal with 0.58%. At our institution, some efforts are aimed at decreasing hospital hypoglycemia rates through the No Harm Campaign. However, there are no set processes in place to determine the underlying cause of hypoglycemia or protocols for interventions to prevent subsequent episodes of hypoglycemia. The objective of this study will be to evaluate the impact of pharmacist interventions to decrease hypoglycemic events at a community medical center.

Methodology
A daily point of care blood glucose report will be generated through the pharmacy database indicating patients with blood glucose (BG) of less than 80 mg/dL. Excluded patients are: pregnant patients, ER patients, and patients under 18 years of age. Appropriateness of nurse or physician interventions to low BG will be assessed and documented. The pharmacist will review the patients’ charts to assess patients’ medications, insulin administrations, dietary status and health conditions that may affect BG control. The cause, if known, of the hypoglycemic event will be identified and recommendations will be made to the health care provider. Data collection will include patient’s demographics, medications, comorbidities, and BG levels. Interventions and patients’ outcomes will be tracked and documented until patient is discharged.

Results & Conclusions: Pending

ACPE #:0126-9999-13-413-L01-P

Learning Objectives:
- Describe the impact of pharmacist led intervention in reducing the incidences of hypoglycemia at a community medical center.
- List types of pharmacist interventions which could prevent further episodes of hypoglycemia.


404 - EVALUATING THE SYMPTOMATIC MANAGEMENT OF ASTHMATICS TREATED WITH MOMETASONE WITH AND WITHOUT MONTELUKAST.

B1. Ambulatory Care

Presented by:

Nancy Nguyen, PharmD
Veterans Affairs Central California Health Care System
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Presenting on Wednesday, May 15 at 1:00 PM in Bay View

The rate of utilization of montelukast sodium (Singulair®), a leukotriene receptor antagonist, in the treatment of asthma is variable from facility to facility within the VISN21 Health Care System. The FDA’s approval of generic versions of Singulair® may also have an influence on the prescribing practice of montelukast by providers. Currently indicated for prophylaxis and chronic treatment of asthma, clinicians commonly prescribe montelukast as an adjunct to inhaled corticosteroids (ICS). The Global Initiative for Asthma (GINA) 2011 guidelines suggest
leukotriene modifiers may be considered as add-on therapy to reduce the dose of ICS in moderate to severe asthma, or improve asthma control in asthmatics uncontrolled with low or high doses of ICS. The guideline cited that several studies, with the exception of one, demonstrated that leukotriene modifiers are less effective than long-acting β2-agonists as add-on therapy. The Criteria for Use of Montelukast developed by the Veterans Health Administration PBM service and medical advisory panel requires patients must be unable to use an ICS or are on an ICS and unable to use a long-acting beta-agonist for step up therapy. Clinical trials have shown inconsistent evidence to support the benefit of montelukast as monotherapy or in combination with an inhaled corticosteroid in improving asthma control and lung function. In the year-long MIAMI study (Zeiger RS, 2005), patients with guideline-defined mild persistent asthma on inhaled fluticasone 88 mcg twice daily had greater improvements in symptoms and quality of life, and asthma rescue-free days compared with patients on montelukast 10 mg once nightly. The MONICA study (Virchow JC, 2010) showed that patients with mild-to-moderate asthma insufficiently controlled on ICS alone, or ICS + LABA, achieved increased Asthma Control Test scores (improved control) with add-on montelukast 10 mg daily, particularly if they were well to completely controlled at baseline. In light of conflicting data, this retrospective chart review is an evaluation of the clinical outcomes of the use of mometasone at maximized doses without montelukast compared with mometasone at any dose with montelukast within VISN 21 of the Veterans Affairs Health Care System.

This is a chart review of patients diagnosed with asthma by ICD-9 code who have been managed on either mometasone 4 puffs twice daily, or mometasone plus montelukast for a minimum treatment duration of 6 months within the last 6 years. Patients will be stratified at baseline by severity of asthma when data is available using GINA guidelines for classification. Charts will be reviewed for the number of unscheduled asthma related visits in the primary care, urgent care or emergency department, or hospital as the primary endpoint. Refills or new prescriptions of the short-acting β2-agonist, albuterol, or oral steroid prednisone documented for asthma exacerbation will be looked at as secondary endpoints. Differences in adverse events between treatment groups will also be evaluated as additional secondary endpoints. Pending final protocol approval, the results and conclusions will be presented upon completion of data collection and analysis at Western States.

ACPE #:0126-9999-13-414-L01-P
Learning Objectives:
- Describe the clinical outcomes of the use of mometasone with and without montelukast in asthmatic patients.
- Identify montelukast’s place in asthma control therapy.


**405 - EXPANSION OF PHARMACY-MANAGED PRESCRIPTION REFILL SERVICES TO SUPPORT PHARMACIST INVOLVEMENT IN THE PATIENT CENTERED MEDICAL HOME (PCMH)**

B1. Ambulatory Care

Presented by:

Lynda Nguyen, PharmD
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Presenting on Wednesday, May 15 at 11:30 AM in Bay View
BACKGROUND: As the number of physicians continues to decrease, physician time strains are becoming more evident. Physician surveys reported that there has been a drop in having sufficient time with patients from 80% to 27% in 1991 to 1999, respectively. Having a pharmacist-managed refill clinic could potentially decrease physician workload as well as increase physician time spent with patients. Studies have shown that pharmacist-managed refill clinics can decrease the amount of patient emergency visits/admissions due to medication errors and in the clinic setting they can overall save patient wait times for refill requests. There have not been many studies that show the clinical benefits of having a pharmacist-managed refill clinic.

OBJECTIVE: This study seeks to demonstrate that pharmacist interventions will improve medication safety, adherence, and management. Clinical pharmacy refill services will also help to standardize the process and approval of prescription refills, while enhancing intradisciplinary collaboration, avoid unnecessary costs and reduce medication related adverse events and hospitalizations through routine lab monitoring and appropriate clinic follow up. The expansion of clinical pharmacy services in a Primary Care Network (PCN) setting will help achieve a patient centered medical home.

METHODS: This retrospective cohort study was conducted at UC Davis Medical Group, Elk Grove Family Practice PCN. Pharmacist-managed prescription refill services were initiated from September 4, 2012 to November 21, 2012 for three out of six family practice (FP) physicians. Data will be analyzed and compared to the three FP physicians not receiving pharmacist-managed prescription refill services.

RESULTS: Results and conclusions are forthcoming and will be presented.

ACPE #:0126-9999-13-415-L01-P
Learning Objectives:
   Describe the role of a pharmacist in a Refill Clinic
   Describe the effects of having a pharmacist as a part of the Patient Centered Medical Home (PCMH)


406 - IMPLEMENTATION OF A TRANSITIONAL CARE CLINIC TO REDUCE READMISSION RATES IN PATIENTS WITH HEART FAILURE
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
Michael Nguyen, PharmD
Yuma Regional Medical Center
minguyen@yumaregional.org

Presenting on Wednesday, May 15 at 8:30 AM in Royal V

Introduction: Heart failure is a complex condition associated with considerable morbidity and mortality. Among other conditions, it is one of the most common reasons for hospital readmissions. Readmissions have been associated with inadequate patient education and difficulty adhering to prescribed self care practices, complex medication regimens, and restricted diets. In an effort to decrease readmission rates, transition of care services have been implemented to address these issues, and aid in patients’ transition from the hospital to their home. The primary aim of the transitional care team is to provide education to patients about their disease states and its management, as well as perform diligent monitoring and proper medication titration through a multidisciplinary effort. Throughout the course of this study, we will determine whether transitional care services decreases readmission rates in patients with heart failure.
Methodology: This study has been approved by the institutional review board. Patients with heart failure and identified as having a high risk for readmission will be enrolled to receive transitional care services. Prior to discharge, clinical pharmacists will conduct a full medication review, provide education materials, and perform medication counseling. After discharge, patients will further attend a 1-hour educational class where the information about medications, diet, and cardiopulmonary rehabilitation will be discussed. Patients will be further followed via tele-monitoring; weight, blood pressure, oxygen saturation, and heart rhythm will be measured and information uploaded into the hospital's electronic medical record system (EPIC). Two nurses will be monitoring this information daily and will provide appropriate interventions as necessary. Resources needed to complete the intervention have been defined. Educational materials have been developed and are currently available. Staff education will be done to establish a standard for satisfactory patient education and to develop staff buy-in. Data will be analyzed in April 2013 to assess 30 day readmission rates. Over the course of the study, surveys will also be conducted to assess the effectiveness and appropriateness of pharmacy medication education.

Results and Conclusion: Will be reported.

ACPE #:0126-9999-13-416-L01-P

Learning Objectives:

- Describe the impact of implementing a transitional care clinic on the rate of readmissions of heart failure patients in a community hospital.
- Describe the role of a pharmacist in the prevention of heart failure readmission as part of a transitional care clinic.


407 - PHARMACIST DISCHARGE COUNSELING ON READMISSION RATES OF PATIENTS ADMITTED FOR A MYOCARDIAL INFARCTION AND DISCHARGED WITH A STENT

B4. General Clinical Practice

Presented by:

Brian Niimi, PharmD
The Queen’s Medical Center PGY-1 Residency Program
bniimi@queens.org

Presenting on Wednesday, May 15 at 8:00 AM in Royal III

Purpose:
This study aims to determine if pharmacist discharge counseling is associated with a statistically significant reduction in readmissions. We intend to specifically examine patients discharged with a drug eluding or bare metal stent from The Queen’s Medical Center after a myocardial infarction (MI). The pharmacist discharge counseling has not been studied in the specific population we are currently investigating. With this study we hope to quantify the effect pharmacist discharge counseling has on readmission. Information gathered in this study will be important to support the pharmacist integration into the discharge process to potentially decrease cost and improve patient outcomes.

Methods:
This retrospective cohort study will examine readmission rates of patients that received discharge counseling by a pharmacist compared to those that did not receive pharmacist counseling. This study will include all patients admitted to The Queens Medical Center for a myocardial infarction that received a bare metal or drug eluding
stent between the dates of December 1, 2007 to November 30, 2012. Procedural codes will be used to determine if discharge patients received a stent during their admission. Patients who were admitted to QMC that received a stent during their hospitalization and discharged from QMC will be followed for 30 days for readmissions as the primary outcome. Readmission is defined as any patient readmitted to QMC or seen in the ED for any reason within 30-days from the initial discharge. Proportions of readmissions related to cardiac restenosis or thrombosis (treatment failure) will be analyzed as the primary outcome. We will also measure readmissions due to medication non-compliance and adverse drug events as a secondary outcome. These outcomes will be identified in Carelink by ICD-9 codes. They were chosen because they are all important factors when evaluating a drug therapy. Drug therapy interventions are the specialty of the pharmacist and our study attempts to determine if there is a relationship between pharmacist intervention (discharge counseling) and patient outcomes.

Results and Conclusion: Will be presented

ACPE #:0126-9999-13-417-L01-P
Learning Objectives:
- List methods pharmacists have shown to be effective in reducing readmission rates
- Describe methods that quantify the efficacy of pharmacy interventions on patient outcomes.


408 - EVALUATION OF INTRAVENOUS ACETAMINOPHEN USE AND ASSOCIATED OUTCOMES IN THE GASTRO-ENTEROPLASTY POPULATION
A5. Neuro-Psych or Pain Management Agents

Presented by:
Nooshin Niknam, PharmD
Glendale Adventist Medical Center
Niknamn1@ah.org

Presenting on Wednesday, May 15 at 9:00 AM in Palm III

Introduction:
The use of opioids in patients post-operatively increases the risk for ileus, constipation, sedation, nausea, vomiting and respiratory depression. The time to first bowel movement is an important measure of progress in post gastro-enteroanastomosis patients. The FDA has approved the use of intravenous (IV) acetaminophen for the management of moderate to severe pain with adjunctive opioid analgesics. IV acetaminophen can be integrated into a multimodal analgesia regimen to optimize pain management and reduce overall opioid use. The significant advantage of IV acetaminophen over other analgesic agents used for the treatment of postoperative pain is its safety and tolerability profile. The purpose of this study is to evaluate the proclaimed benefits of IV acetaminophen for patients undergoing gastro-enteroanastomosis at Glendale Adventist Medical Center.

Methods:
This is a retrospective comparison chart review. The treatment group will include patients who receive a multimodal analgesic regimen including one pre- or intra-operative dose of IV acetaminophen. The control group will include patients who received the traditional opioid analgesic regimen. Data was collected between August 2012 and February 2013. The primary outcome is percent reduction of opioid usage and the secondary outcome is the reduction in mean pain score during the patient’s stay in the post-analgesia care unit. The groups will have similar baseline characteristics.
Results:
To be discussed at the Western States Conference.

ACPE #:0126-9999-13-418-L01-P
Learning Objectives:
- Identify the patient populations that would benefit most from the use of IV acetaminophen.
- Describe the benefits associated with the intra-operative use of IV acetaminophen in gastro-entero-plasty patients.


409 - DEVELOPING A PHARMACIST SPECIFIC TRAINING PROGRAM FOR PEDIATRIC EMERGENCY EVENTS
B6. Pediatric or Gender Specific Care

Presented by:
Sai Nimmagadda, PharmD
Lucile Packard Children’s Hospital
snimmagadda@lpch.org

Presenting on Tuesday, May 14 at 3:00 PM in Sunset II

Introduction:
Pharmacists respond to all emergency events at our institution. However, reports from our Code Committee suggest pharmacist performance at codes can be variable. Our hospital currently requires all pharmacists obtain biannual Basic Life Support (BLS) certification, as well as Pediatric Advanced Life Support (PALS) certification upon hire. A proposal requiring mandatory PALS recertification biannually was found to be time consuming and expensive without providing pharmacist targeted training.

Two pharmacist-specific training programs were identified in published literature that assessed pharmacist confidence and comprehension before and after training interventions, but did not include a measure of pharmacist performance preparing medications during an emergency event. Understanding pharmacist confidence, competence, and comprehension all influence performance during an emergency event, we devised a pharmacist-specific training program designed to improve outcome measures in all three areas.

The training program was based on real-life code experiences from our critical care clinical pharmacists in collaboration with members of our institution’s interdisciplinary Code Committee. Our program was designed to be more time efficient and cost-effective than PALS recertification while providing more pharmacist focused training aimed at improving pharmacist performance during emergency events.

Our primary objective was to determine if a pharmacist-specific training program could improve pharmacist performance during emergency events.

Methodology:
Pharmacists at our institution took a survey created to acquire demographic, experience, and subjective information regarding their comfort responding to emergency events. A standardized simulated code experience where pharmacists were timed while physically preparing emergency medications was devised to assess pharmacist competence. Finally, a multiple choice exam was developed to assess pharmacist comprehension of PALS algorithms and the contents of our institution’s emergency medication box.

Pharmacists then participated in a half-day training program incorporating didactic and practical learning sessions. The didactic portion of the training was designed to emphasize code team roles, review PALS
algorithms, and cover essential medication information. The simulation-based practical portion of the training focused on familiarizing pharmacists with the contents of the emergency medication box, provide practice preparing medications in a chaotic environment, and simulated participation on a multi-disciplinary emergency event team.

Once training was completed, pharmacists were reassessed using the same tools used pre-training. Pharmacists served as their own controls, with comparisons of confidence, comprehension, and competence before and after training. Additional analyses were conducted to correlate performance to past emergency event experience and time since their last PALS certification.

Results and Conclusion:
Results and Conclusion will be presented.

ACPE #:0126-9999-13-419-L01-P
Learning Objectives:
Describe skills necessary for pediatric pharmacists during emergency events.
Explain the benefits of implementing a pharmacist specific training program for pediatric emergency event response.


410 - THE EFFECT OF VERIGENE TESTING TO RAPIDLY AND DEFINITIVELY IDENTIFY ORGANISMS IN PATIENTS WITH GRAM POSITIVE BACTEREMIA

A1. Infectious Disease - Anti-infective Agents

Presented by:
Duong Nishiguchi, PharmD
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Presenting on Wednesday, May 15 at 5:00 PM in Dockside

Bacteremia is a common cause of hospitalization in adults, with an estimated incidence of 4.2% in the U.S. Gram-positive bacteremia is of particular concern due to the high incidence and association with resistant organisms. It has been demonstrated that delayed administration of appropriate antibiotics is associated with a decrease in survival rate. Thus, the inability to rapidly identify resistant strains of pathogenic bacteria in blood cultures has led to antimicrobial use that is ineffective, costly, and contributes to the proliferation of resistant organisms such as MRSA and VRE. In addition, contaminant species are frequently responsible for false-positive blood cultures that lead to inappropriate antimicrobial use. Because of the large burden of infection and contamination due to Gram-positive bacteria, rapid identification of both the organism and its resistance characteristics is essential for clinicians to determine appropriate therapy to improve patient outcomes. Rapid molecular testing of blood cultures reduces the delay and reduces hospital costs. The Verigene Gram-Positive Blood Culture Test is a multiplexed, automated nucleic acid test that provides fast identification of genus, species, and MRSA and VRE resistance determinants for 15 different Gram-positive markers in blood samples, including Staphylococcus species, Streptococcus species, Enterococcus spp., Listeria species, mecA, vanA, and vanB. The Verigene test can identify bacteria and antimicrobial resistance genes from Gram-positive blood culture bottles within two and a half hours, as compared with current microbiological methods, which can take up to five days. Thus, the Verigene test decreases the time from detecting a positive blood culture to identifying the organism. The purpose of this study is to evaluate the effect of implementing Verigene testing on the cost
and clinical outcomes of treating Gram-positive bacteremia at San Joaquin General Hospital. For the retrospective arm of the study, data was collected for all adult patients (>18 years of age) who had blood cultures drawn at SJGH for which initial Gram stain and culture results identified the presence of Gram-positive organisms. In the prospective arm of the study, data was collected through chart and electronic record review on similar patients being treated for suspected Gram-positive bacteremia whose blood samples underwent Verigene testing. Clinical outcomes, including time to appropriate treatment, duration of antibiotic use, length of stay, number of repeated cultures, and mortality will be analyzed. A comparison will be made between the two study arms for all data points. Additionally, a cost analysis will be conducted to show the difference in the cost of treating patients with antibiotics while waiting for the results from culturing the blood sample versus conducting a Verigene test. Results will be presented.

ACPE #:0126-9999-13-420-L01-P

Learning Objectives:
- Describe how the Verigene test can identify Gram positive organisms in blood culture samples.
- Explain how early identification of Gram positive organisms can narrow antibiotic therapy and reduce duration of antibiotic use.


### 411 - EVALUATION OF GRANULOCYTE GROWTH FACTOR REGIMENS WITH DOSE-DENSE ADJUVANT CHEMOTHERAPY FOR BREAST CANCER

**A2. Oncology - Anti-neoplastic and Non-anti-neoplastic**

Presented by:

**Kris Nishimura, PharmD**
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**Presenting on Wednesday, May 15 at 11:30 AM in Sunset I**

The use of dose-dense adjuvant chemotherapy in non-metastatic breast cancer improves disease-free survival and overall survival. Recombinant granulocyte growth factors (G-CSF) such as filgrastim, decrease the duration of neutropenia, lessen dose delays related to neutropenia, and reduce febrile neutropenia risk. A recent focus on the long-term cost of cancer care is leading to evaluations of costly oncology drugs such as filgrastim. In addition, the choice of G-CSF products and regimens may affect adverse events and patient compliance. The objective of this study is to compare an alternating 4 day (days 5, 7, 9, 11) filgrastim schedule implemented at Kaiser Permanente Walnut Creek in April 2011 to traditional 5-7 daily filgrastim doses for dose-dense doxorubicin/cyclophosphamide (AC) followed by paclitaxel (T). This is an observational, retrospective cohort study of patients initiated on dose-dense chemotherapy between January 2009 and October 2012. Traditional dosing was evaluated from January 2009 to March 2011. Alternating day dosing was evaluated from April 2011 to October 2012. Inclusion criteria include: at least 18 years of age, breast cancer stages I to III, and dose-dense AC followed by T treatment. Exclusion criteria include: history of blood disorders, other primary malignancies, and previous pegfilgrastim use. Dose-dense AC followed by T chemotherapy will be defined as AC given every 2 weeks for 4 cycles, followed by T every 2 weeks for 4 cycles. Neutropenia is defined as an absolute neutrophil count (ANC) less than 1500 per mcL. Febrile neutropenia is defined as an ANC less than 500 per mcL associated with an oral temperature over 38.3°C. Data will be collected from electronic medical records. The primary
outcome will be incidence of neutropenic treatment delays. Secondary outcomes include occurrence of neutropenia, febrile neutropenia, and hospitalizations. The results and conclusions will be discussed.

ACPE #:0126-9999-13-421-L01-P
Learning Objectives:
- Describe the alternating day filgrastim dosing regimen with dose-dense doxorubicin/cyclophosphamide followed by paclitaxel chemotherapy.
- List the potential benefits of using the alternating day filgrastim dosing regimen.


412 - IMPACT OF LANGUAGE CONCORDANCE ON GLYCEMIC CONTROL AMONGST LATINO DIABETICS
B1. Ambulatory Care

Presented by:
Lucas Njonje, PharmD
Kaiser Permanente, South Sacramento
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Presenting on Wednesday, May 15 at 2:00 PM in Bay View

Background: Epidemiological studies have shown that a significantly larger number of Latino patients in the US with diabetes are not under good control when compared with other ethnicities. Successfully managing diabetes requires adequate communication between the healthcare practitioner and the patient about the goals of therapy. In 2006, Kaiser Permanente Medical Center at South Sacramento (KP-SSC) dedicated an entire medicine unit solely to provide care to the Latino patient population. All practitioners in this unit are able to provide care with fluent communication in Spanish language.

Objective: To determine the clinical implications of a linguistically-tailored approach of care on glycemic control among Latino diabetic patients at KP-SSC

Methodology: A retrospective chart-review analysis examining the correlation between practitioner-patient language concordance and glycemic control. The main outcome measured will be differences in good glycemic control between Spanish-speaking Latino patients who are members of the Latino clinic (Language Concordant group) and Spanish-speaking Latino patients who are non-members of the Latino clinic (Language Discordant group). Data will be analyzed using the average values of the last available A1c result for each patient within the last 1-year period.

Results: Pending

Conclusion: To be determined based upon results

ACPE #:0126-9999-13-422-L01-P
Learning Objectives:
- Describe the correlation between language concordance and better glycemic control among Latino diabetics.
- Explain the criteria for patients’ HbA1c goal.

413 - COMPARISON OF A SIMPLIFIED OPIOID WITHDRAWAL SCORE TO THE MODIFIED FINNEGAN SCORE IN NEONATES RECEIVING METHADONE

B6. Pediatric or Gender Specific Care

Presented by:

Yukiko Noda, PharmD
Rady Children’s Hospital San Diego
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Presenting on Wednesday, May 15 at 11:00 AM in Sunset II

Introduction: Neonatal opioid withdrawal can be caused by maternal opioid use during pregnancy and opioid treatment in the hospital setting. Assessment of the severity of withdrawal and the need for opioid replacement therapy is traditionally achieved through the use of an objective scoring tool called the Modified Finnegan neonatal abstinence syndrome (NAS) scoring system. Recently, a novel, simplified NAS scoring system was developed and implemented at the UC San Diego Medical Center to help guide methadone replacement therapy in their Regional Neonatal Intensive Care Unit (NICU). The objective of this study is to evaluate the ability of the simplified NAS scoring system to assess abstinence symptoms and to predict the need for opioid dose titration in neonates suffering from opioid withdrawal in the Regional NICU at Rady Children’s Hospital San Diego (RCHSD).

Methodology: Chart review of NICU patients who received methadone from July 2012 to May 2013 at RCHSD. Demographic and clinical data, including gestational age, weight, diagnoses, maternal opioid use, standard NAS scores, and dosing history of opioids and benzodiazepines was collected. For each standard NAS score, a simplified NAS score was calculated by assessing the 20 components of the standard NAS score and assigning scores to the 5 components that form the simplified NAS score. The correlation between the standard and simplified NAS scores was examined using the Spearman correlation, and the threshold for each scoring system in predicting opioid dose titrations was compared to actual opioid dose titrations.

Results: In eight neonates receiving methadone, the mean gestational age was 39 ± 1.3 weeks. Twenty-five percent of neonates were treated for opioid withdrawal due to maternal opioid use. The remainder were treated for opioid withdrawal due to long term opioid administration for analgesia and sedation during mechanical ventilation, extracorporeal life support, or postoperatively. Common diagnoses included meconium aspiration syndrome, congenital heart disease, and congenital diaphragmatic hernia. The trend of the simplified NAS scores mirrored the trend of the standard NAS scores.

Conclusion: Final results will be presented.

ACPE #:0126-9999-13-423-L01-P

Learning Objectives:
- Determine the correlation between the standard NAS score and the simplified NAS score in neonates receiving methadone.
- Describe appropriate application of the simplified NAS scoring system in opioid dosing strategies for NAS.


414 - EFFECT OF LDL CHOLESTEROL TREATED WITH STATIN MEDICATIONS TO ABOVE OR BELOW 100 MG/DL IN VERY ELDERLY VETERANS

B5. Long-Term, Geriatric or Hospice Care
Presented by:

Davena Norris, PharmD
Southern Arizona VA Health Care System
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Presenting on Tuesday, May 14 at 11:00 AM in Sunset IV

BACKGROUND: Cardiovascular disease (CVD) is the leading cause of mortality in the United States, accounting for 1 of every 3 deaths. Multiple studies have evaluated the effect of lipid-lowering therapy on the primary and secondary prevention of CVD. However, few studies have included patients older than 80 years of age, so there is little evidence to guide the use of lipid-lowering agents in the very elderly population.

OBJECTIVE: The purpose of this study is to evaluate if treating low-density lipoprotein (LDL) cholesterol with statin medications to < 100 mg/dl compared to > 100 mg/dl reduces the risk of cardiovascular-related hospitalizations in patients 80 years of age and older.

METHODOLOGY: This is a single center, historical prospective cohort study conducted by reviewing the electronic medical records at the Southern Arizona VA Health Care System. The cohorts will include Veteran subjects who were 80 years of age and older between January 1, 2001 and January 1, 2011, and issued a prescription for a statin medication. Exclusion criteria will include duration of statin treatment < 1 year after index date, statin treatment discontinuation > 3 months, and incomplete data for follow-up (lipid panel obtained less frequently than every 18 months). The start of the follow-up period (i.e. index date) will be the date on or after January 1, 2001 when a subject is at least 80 years of age and has been on a statin for a minimum of six months. Subjects will be followed until completion of the study (July 31, 2012), discontinuation of statin medication for 3 months or longer, or time of death. The subjects will be separated into two study groups: mean LDL cholesterol < 100 mg/dl and mean LDL cholesterol > 100 mg/dl, determined by averaging available LDL levels during the follow-up period, excluding levels measured during acute hospitalizations. The primary outcome of this study is the incidence of hospitalization due to cardiovascular or cerebrovascular causes, which will be identified by International Classification of Diseases 9th Revision (ICD-9) codes and confirmed by reviewing hospital admission progress notes. Secondary outcomes will include the incidence of cardiovascular-related mortality, all-cause mortality, and the discontinuation of statin medications due to documented adverse drug events. This work is supported by the resources of the Southern Arizona VA Health Care System, Tucson, Arizona.

RESULTS/CONCLUSION: To be presented later.

ACPE #:0126-9999-13-424-L01-P

Learning Objectives:

- Explain the potential benefits and risks of tighter LDL cholesterol control in the very elderly population.
- Describe the evidence for the effects of statins when treating LDL cholesterol to < 100 mg/dl compared with > 100 mg/dl on cardiovascular endpoints in the very elderly.


415 - PHARMACODYNAMIC CHARACTERISTICS OF NEPHROTOXICITY ASSOCIATED WITH VANCOMYCIN USE IN CHILDREN

B7. Pharmacokinetics

Presented by:
BACKGROUND: Vancomycin is the treatment of choice for serious methicillin-resistant staphylococcus aureus (MRSA) infections. The need to increase doses to combat escalating MRSA minimum inhibitory concentration (MIC) values is coupled to the potential rising risk of developing nephrotoxicity in children. Understanding the pharmacodynamic properties that best correlate to nephrotoxicity is important. Our study objectives were to determine the pharmacodynamic indices with the best predictive value for nephrotoxicity in children receiving vancomycin including vancomycin regimens that: (1) achieve trough levels < 10 mg/L, 10-15 mg/L, and > 15 mg/L; and (2) achieve an AUCO-24/MIC < 400 and ≥ 400. We hypothesize that the higher trough values and larger AUC/MIC will predict higher risk for nephrotoxicity.

METHODS: This study is a retrospective cohort analysis of vancomycin administered to pediatric inpatients admitted to Miller Children’s Hospital and Rady’s Children Hospital from September 2003 to December 2011. Pediatric patients who received ≥ 48 hours of vancomycin and had normal baseline renal function (as determined by normal serum creatinine [SCr] values based on age) were included in this study. A one-compartment model with first-order kinetics was used in NONMEM 7.2 to estimate clearance (CL), volume of distribution (Vd) trough concentrations (Cmin), and area-under-curve (AUC). Both Cmin and AUC/MIC were modeled as continuous, dichotomous (by use of a classification and regression tree [CART]—derived breakpoint), and categorical variables (i.e., < 10 mg/L, 10-15 mg/L, and ≥ 15 mg/L vs. < 400 and ≥ 400, respectively).

RESULTS: To be presented

ACPE #:0126-9999-13-425-L01-P
Learning Objectives:
- Explain the clinical utility of monitoring vancomycin AUC/MIC in the pediatric population.
- Describe the pharmacodynamic indices that can best predict nephrotoxicity associated with vancomycin use in children.


416 - APPLICATION OF THE PHARMACY PRACTICE MODEL INITIATIVE (PPMI) IN A 450-BED COMMUNITY HOSPITAL
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

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Presenting on Wednesday, May 15 at 9:00 AM in Sunset IV

The American Society of Health System Pharmacists (ASHP) and the ASHP Research and Education Foundation’s, Pharmacy Practice Model Initiative (PPMI), provides a conduit for evaluating and identifying opportunities in
current pharmacy practice. Recent implementation of computerized physician order entry (CPOE) and electronic charting provides a stimulus for practice model assessment at PeaceHealth Southwest Medical Center (PHSW) in Vancouver, Washington. The objective of this study is to develop the optimal inpatient pharmacy practice model for this 450-bed community hospital.

The current inpatient practice model was evaluated using the PPMI Hospital Self-Assessment Tool. The tool identified opportunities for advancement within the current practice model. The opportunities identified were compared with Washington state data collected via The Washington State Pharmacists Association (WSPA). Additionally, the tool generated a 40-item action-list that correlates to self-assessment questions. The action-list was individually reviewed by pharmacist practitioners on the project team and ranked based on low, medium or high feasibility and impact. Consensus was gathered on the feasibility and impact of each action-item in order to develop a master action-list for use in development and growth of the pharmacy department. Input on PHSW’s pharmacy practice model was collected from pharmacist practitioners using a standardized Likert-scale questionnaire along with free-text comments. The results of the questionnaire were tallied and comments recorded securely. Pharmacist questionnaire responses were used to build the consensus for practice change that is tailored to the needs of the pharmacy practitioners at PHSW. Questionnaire data was focused on the system used to capture and report pharmacy metrics and pharmacist value. The tracking tool has been revised to reflect the post-CPOE/EMR model and revamped for consistency and direction in tracking between different pharmacists and service-lines. The culmination of self-assessment data will be used to develop a vision statement, strategy and goals for the PHSW inpatient pharmacy department. The data collected from this evaluation will be used to align current practice with the goals of ASHP’s PPMI and the pharmacy department’s vision to provide optimal and efficient patient outcomes. Results to be discussed.

ACPE #:0126-9999-13-426-L04-P
Learning Objectives:
- Describe the process of assessing an inpatient-pharmacy practice model using ASHP’s PPMI Hospital-Self-Assessment tool
- Describe strategies for collecting pharmacist input and establishing staff buy-in on practice-model direction and change


### 417 - IMPLEMENTATION OF 72-HOUR ANTIBIOTIC TIMEOUT IN A LONG-TERM ACUTE CARE HOSPITAL

A1. Infectious Disease - Anti-infective Agents

Presented by:

Daniel O’Connell, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Garden

Introduction: Antimicrobial stewardship initiatives have repeatedly been shown to improve the safe, effective and appropriate use of antibiotics. The Centers for Disease Control and Prevention has recommended that an antibiotic review or “time-out” be used to evaluate whether continuation of antimicrobial therapy is appropriate. A pharmacist-driven protocol is being implemented to determine if such a review improves medication usage.
Methods: All patients receiving an antibiotic will be evaluated by a pharmacist with regard to indication, clinical markers (fever and other symptoms), and lab results (leukocytosis, urinalysis, etc.) If appropriate cultures have not been ordered, pharmacist may request them. Culture results will be reviewed no later than 72 hours after collection, and then daily until finalized. Based on culture results and patient evaluation, pharmacist will submit recommendations regarding changes in therapy directly to ordering providers. Possible areas of intervention will include: no-growth cultures, antibiotic/microorganism mismatch, double coverage, specimen contaminants, and non-preferred therapy. Recommendations will be submitted via pre-printed consultation form. Number and type of recommendations will be recorded, as well as acceptance or rejection by providers. Results and conclusions will be presented.

ACPE #:0126-9999-13-427-L01-P
Learning Objectives:
   - Describe the key elements of the antibiotic timeout program
   - Explain how the program impacted antibiotic use


418 - IMPROVING TDAP IMMUNIZATION RATES IN PREGNANT WOMEN THROUGH QUALITY-IMPROVEMENT IN ELECTRONIC MEDICAL RECORD PROCESSES
B6. Pediatric or Gender Specific Care

Presented by:
Diane Ogborn, PharmD
University of Utah Community Practice Residency
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Presenting on Wednesday, May 15 at 11:30 AM in Sunset II

Introduction:
The Advisory Committee on Immunization Practices (ACIP) recommended in June 2011 that all unvaccinated pregnant women receive one dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccine after 20 weeks’ gestation.
The objective of this quality-improvement study was to determine if there is a difference in Tdap immunization rates in pregnant women before and after the implementation of an electronic medical record checklist, standardized electronic charting phrases, and staff education specific to Tdap immunizations for use during the late-second and third trimester prenatal visits.
Methodology:
Our study was conducted in a university-owned community clinic OB/GYN service and compared Tdap immunization rates in pregnant women more than 20 weeks’ gestation before and after the implementation of quality-improvement measures to promote the evidence-based use of Tdap vaccine in pregnant women.
We worked with OB/GYN physicians and medical assistants at one clinic to educate the OB/GYN team regarding ACIP guidelines for Tdap immunization in pregnant women and to design new tools in the electronic medical record. The EMR-based tools prompted the medical staff to assess pregnant patients’ Tdap immunization history, educate, offer, administer, and document the administration of the Tdap immunization.
The primary outcome was Tdap immunization rates of pregnant women 20+ weeks of gestation in a historical cohort of women before and in a post-intervention cohort after the quality-improvement changes. Patient demographics and Tdap immunization status were retrospectively obtained from the electronic medical record.
database for both groups. The a priori alpha was set at 0.05. The expected sample size was 85 patients in the historical group and 55 patients in the quality-improvement group. This sample size would give the study 80% power to detect a 20% difference in immunization rates (10% to 30%) between the groups.

Results:
Our retrospective analysis captured 442 patients in the historical group and 175 in the quality-improvement group. Implementation of an electronic medical record checklist, standardized electronic charting phrases, and staff education specific to pertussis (Tdap) immunization in pregnant women significantly increased Tdap vaccination rates from 1.6% in the historical cohort to 22.9% in the quality-improvement cohort (p<0.001) in this one OB/GYN clinic.

Conclusions:
Our study utilized a multidisciplinary approach to determine if a change in the clinic electronic medical charting system and staff education would increase the Tdap vaccination rates in pregnant women. This study attempted to assess a process to bring one clinic’s Tdap vaccinations in line with ACIP recommendations for pregnant women. This study evaluated and gave support for the value of electronic medical records processes and health care team education to support practitioners in implementing a vaccination program for pregnant women previously not vaccinated with Tdap.

Future considerations in this practice area in our healthcare system are to implement and assess the impact of an active hard-stop decision support tool, “best practice alert,” that fires when pre-specified parameters for this patient population are met. This active tool will force each provider to address Tdap vaccination status at least one time for each patient during each pregnancy.

ACPE #:0126-9999-13-428-L01-P
Learning Objectives:
- Describe electronic medical record process changes that will encourage multidisciplinary teams in your practice setting to use evidence-based immunization guidelines for patient care and improving patient outcomes.
- List several differences between data elements accessible in an operational database of patient specific data and data elements stored in an electronic data warehouse.


419 - PATIENT AND PROVIDER SATISFACTION WITH CLINICAL PHARMACY SERVICES INTEGRATED INTO A SAFETY NET CLINIC
B1. Ambulatory Care

Presented by:
Jeong Oh, PharmD
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Presenting on Wednesday, May 15 at 2:30 PM in Bay View

Introduction:
The Patient Protection and Affordable Care Act (PPACA) provides support for new primary care models, such as medical homes and team management of chronic diseases. Clinical pharmacy services (CPS) are essential for ensuring that medication therapy is safe and effective for the highest-risk patients, and a key factor in the success of integrating CPS into a healthcare team is satisfaction among patients and providers. A comprehensive
evaluation of patient and provider satisfaction with CPS will identify areas in need of improvement and help pharmacists modify their services accordingly. The objective of this descriptive study is to evaluate patient and provider satisfaction with a newly-integrated clinical pharmacy service in a large urban safety net organization.

Methodology:
Written survey instruments will be used to measure patients’ and providers’ satisfaction with several facets of CPS. The patient satisfaction questionnaire is derived from the CAHPS survey (available on the AHRQ website). The provider satisfaction questionnaire is adapted from similar surveys conducted previously among healthcare providers who practice in settings where CPS has been established. Survey results will be analyzed according to the validated methods from the sources of the survey tools.

Results and conclusions:
To be presented at Western States Conference.

ACPE #:0126-9999-13-429-L01-P
Learning Objectives:
- Describe an approach to evaluating patient and provider satisfaction with clinical pharmacy service in a safety net clinic.
- List strengths and weaknesses of a clinical pharmacy team as perceived by patients and providers, and develop strategies to improve services where needed.


420 - OUTCOMES OF A NEWLY IMPLEMENTED ANTIMICROBIAL STEWARDSHIP PROGRAM (ASP)
A1. Infectious Disease - Anti-infective Agents

Presented by:
Elizabeth OHara, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Garden

Introduction:
The inappropriate use of antibiotics has been identified as one of the major risk factors for rising antimicrobial resistance in institutions and communities across the United States. Studies have shown that the overuse and misuse of antibiotics can negatively impact patient outcomes, increase patient length of stay, and increase the total cost of care (Dellit et al 2007). Effective ASPs have been shown to improve patient care by limiting inappropriate use of antibiotics and improving the selection of appropriate agents. They function to optimizing the dose, route, and duration of the antibiotic based on individual patient factors. Two core strategies have been identified as the foundation of an ASP and include prospective audits of antimicrobial use with intervention and feedback for the providers as well as formulary restriction and required pre-authorization for select antimicrobials.

Methodology:
This project is a performance improvement initiative to ensure a fully functioning antimicrobial stewardship program as mandated by National Veteran’s Administration. The program began July of 2012. The institution’s Electronic Health Record (EHR) was utilized to identify all patients being treated with an intravenous trigger drug.
before weekly ASP rounds. Medications profiles of the identified patients were reviewed by a pharmacist for appropriateness of therapy, potential de-escalation, dose optimization based on weight, age, and/or renal function, and potential IV to PO conversion. Recommendations were then summarized and presented to the ASP team during patient rounds. Final recommendations were reviewed, agreed upon by the team, documented in the EHR, and then verbally communicated to the covering medical team. De-identified patient information was recorded for retrospective data collection.

Results: As a way of evaluating standards of care of an ASP program, the following data will be evaluated. This data will routinely be collected and evaluated as part of performance improvement for internal operations assessment.

- Antimicrobial utilization using Defined daily doses (DDD) and cost data from FY 2012 & FY 2011
- Local resistance patterns using institutional antibiogram trends
- Direct cost savings calculated using real time cost and days of therapy avoided calculations
- Length of stay (LOS) for pneumonia from FY2012 & FY 2011
- Appropriateness of therapy for pneumonia based off of pre- and post-ASP implementation 30-day readmission rates
- Clostridium difficile infection incidence pre- and post-ASP implementation

Conclusion: Results will be evaluated to determine if anticipated benefits of an ASP are realized.

ACPE #:0126-9999-13-430-L01-P
Learning Objectives:
- Summarize the key components of a functional antimicrobial stewardship team.
- Describe strategies for evaluating the impact of the ASP on patient outcomes, antimicrobial resistance patterns, and institutional antimicrobial cost.


421 - DISCREPANCY DETECTION CHARACTERISTICS OF AN INPATIENT ADMISSION MEDICATION REVIEW SOFTWARE: A DESCRIPTIVE STUDY
B4. General Clinical Practice

Presented by:
Lindsey Ong, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Royal III

The Portland Veterans Affairs Medical Center (PVAMC) developed a tablet-based software prototype to operationalize a pharmacist-driven hospital admission medication reconciliation process. The software is intended to improve the completeness and validity of the patient history by both assembling a multimedia list of prescriptions using institutional dispensary data and by automating components of the health record documentation.

The objectives of this single center, cross-sectional descriptive study are to measure the number, type, root-cause, and clinical significance of medication adherence discrepancies identified during a pharmacist-conducted medication history using the software.
This quality improvement/quality assurance project was determined to be exempt by the PVAMC Institutional Review Board.

The patient sample included a total of 35 mostly white, male, geriatric Veterans admitted to the medical and surgical services. The mean number of discrepancies found per patient using the prototype software was $8.03 \pm 4.09$. $60.3 \pm 6.4\%$ of the discrepancies found were due to system-generated causes, while $38.1 \pm 3.2\%$ were due to a patient-generated cause ($P = 0.002$). Further results will be presented at the meeting.

ACPE #:0126-9999-13-431-L01-P

Learning Objectives:
- Describe the discrepancy detection capabilities of a novel medication reconciliation software incorporated into pharmacist workflow.
- List the most common patient and setting risk factors associated with higher numbers of medication discrepancies.


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422 - DEVELOPING, IMPLEMENTING, AND EVALUATING COMPUTER-BASED PHARMACIST COMPETENCIES OF CHEMOTHERAPY COMPLICATIONS

C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Rob Ono, PharmD

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Presenting on Wednesday, May 15 at 9:00 AM in Palm II

INTRODUCTION

Clinical pharmacists verify and monitor a range of chemotherapy regimens for oncology patients. Treatment of cancers may result in certain adverse reactions or complications, such as tumor lysis syndrome and febrile neutropenia. Pharmacists must ensure safe and appropriate medication management for these patients. This project will: (1) Assess the pharmacist's current knowledge of chemotherapy-induced complications; (2) Establish a standard competency level regarding identification of patients at risk for these complications and its management; and (3) Supplement the chemotherapy clinical checklists.

METHODOLOGY

Chemotherapy references and oncology guidelines will serve as the basis for developing the computer-based learning modules for pharmacists. Active learning methods will be employed to facilitate delivery of the information. Select chemotherapy-related complications (e.g. febrile neutropenia, tumor lysis syndrome, chemotherapy-induced nausea and vomiting) will be presented. Pharmacy managers, pharmacists, and oncologists will review the content for accuracy and appropriateness prior to implementation. Knowledge assessment will occur before beginning the modules, as well as throughout the modules. In addition, participants will be asked to complete a survey before and after completing the learning modules to assess their confidence in using the material in clinical practice. The data will be evaluated to determine the effectiveness of this method of providing education to pharmacists.

RESULTS and CONCLUSION

The findings of this study will be presented.
ACPE #:0126-9999-13-432-L01-P

Learning Objectives:
- Describe the need for developing chemotherapy complication competency modules
- Describe the benefits of implementing computer-based competency modules


423 - PROVIDER RESPONSE AND MANAGEMENT OF LIPIDS FOLLOWING THE AMLODIPINE-SIMVASTATIN DRUG INTERACTION ANNOUNCEMENT

B1. Ambulatory Care

Presented by:

Alicia Ortega, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Bay View

Introduction: In 2011, the FDA issued updated dosing recommendations for simvastatin use. Data indicated high doses of simvastatin and certain medications could increase patient risk for myopathy, potentially leading to rhabdomyolysis. In particular, a new drug-drug interaction between amlodipine and simvastatin was found. The FDA recommended to not exceed 20 mg of simvastatin with amlodipine administration. The Veterans Affairs Prescription Benefits Manager (PBM) and the SAVAHCS Pharmacy and Therapeutics committee both recommended providers consider each patient case and determine their risk for adverse effects. The purpose of this study is to evaluate how SAVAHCS providers responded to the VA PBM and FDA advisories, to investigate how this response impacted lipid control, and determine if any adverse effects occurred from concomitant administration of simvastatin and amlodipine.

Methods: This research is the result of work supported with resources and the use of the facilities of Southern Arizona VA Health Care System (SAVAHCS), Tucson, AZ. This retrospective chart review utilizes the SAVAHCS electronic medical records to identify patients between 18 and 89 years of age, with active prescriptions for amlodipine and simvastatin on June 9, 2011, and with a lipid panel up to 18 months prior to the PBM advisory release on June 9, 2011. Patients who had a change in their simvastatin dose will be compared to those who did not. The primary endpoint is monitoring of lipid panels. The secondary endpoints will compare the averages of HDL, total cholesterol, and LDL cholesterol (calculated or direct) before and after the follow-up lipid panel within and between each group. Demographic data will be collected on each patient for age, gender, medical conditions (hypertension or hyperlipidemia), and health care provider managing hyperlipidemia. For each subject, the dose of amlodipine and simvastatin at the time of the VA PBM release will be recorded. Any change in simvastatin dose will be noted and the drug and dose will be recorded when simvastatin is changed to an alternative statin. The values for any lipid panels (total cholesterol, triglycerides, LDL, and HDL) within 12 months after the VA PBM release or until September 1, 2012, whichever occurs first, will be collected. Adverse events related to statins will also be noted. Descriptive statistics will be used to analyze demographic data. The primary endpoint will be analyzed using a Chi-square. A paired Student’s t-test will be used to analyze the secondary endpoint of the before and after averages for total cholesterol, LDL, and HDL within each group. For the before and after averages for total cholesterol, LDL, and HDL between each group, a Student’s t-test will be calculated.

Results and Conclusions: To be presented
Emergency departments (EDs) have the highest rate of preventable adverse drug events in the hospital setting. Overcrowding, increased boarded patients and a fast paced environment are factors that contribute to errors. Strategies and standards to prevent ED errors has gained the attention of regulating and accrediting bodies such as the Centers for Medicare and Medicaid Services (CMS), Det Norske Veritas (DNV) and The Joint Commission (TJC). Medication management standards require pharmacists’ review of medication orders prior to drug administration, with the exception of urgent medications. In response to medication error scrutiny, the number of pharmacists staffing in the ED has increased nationwide. Additional studies have reported a decrease in medication errors with the presence of pharmacists’ services in the ED. Remote prospective order verification of Hoag Hospital Irvine’s (HHI) Emergency Department was initiated in August 2012.

The purpose of this study is to capture interventions made by pharmacists during prospective ED order verification and to analyze the effects on medication administration times. Around the clock documentation of pharmacists’ interventions for ED orders was prospectively collected from October 31, 2012 through January 31, 2013. Reasons for interventions and the respective outcomes were documented and a retrospective chart review was conducted in order to determine patient demographics, order entry, verification and medication administration times. This observational study did not require IRB approval. Results and conclusions will be presented.

ACPE #:0126-9999-13-434-L01-P
Learning Objectives:
- List the interventions made by pharmacists during prospective ED order verification.
- Describe the impact of prospective order verification on the turnaround time to medication administration.

425 - EVALUATING VANCOMYCIN DOSING AT A COMMUNITY HOSPITAL
A1. Infectious Disease - Anti-infective Agents

Presented by:

Camille Pacis, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Garden

Background:
Pharmacy services at PIH Health Hospital provide vancomycin dosing and serum level monitoring to attain optimal therapeutic concentrations and decrease the risk of drug-related adverse effects such as nephrotoxicity and ototoxicity. Higher target trough goals (15-20 mg/L) were adopted for treatment of certain diseases such as bacteremia, endocarditis, and pneumonia. Empiric loading and maintenance dosing were initially achieved by utilizing population-based pharmacokinetic (PK) parameters, such as volume of distribution (Vd) and elimination rate constant (Kel). Both peak and trough serum concentrations were then measured to arrive at the optimal dosage adjustment based on patient-specific half-life (t ½) and Kel. The current vancomycin empiric dosing strategy in the hospital is based on dosing weight (DW) to estimate Vd. However, the recent IDSA/ASHP Vancomycin Consensus guideline recommend using actual body weight (ABW) when empirically dosing vancomycin in order to provide better penetration, increase probability of achieving target concentration, and improve clinical outcomes (Evidence III-B). Furthermore, dosing guidelines for obese patients (BMI ≥ 30 kg/m2), who are well-represented in the current hospital’s patient population, continue to be limited.

Study Objectives:
To evaluate the most appropriate dosing strategy (dosing weight, actual body weight, ideal body weight, and adjusted body weight (AdjBW)) for determining the Vd that would optimize therapeutic vancomycin levels while avoiding toxicity.

Method:
This is a retrospective chart review of adult (age ≥ 18 years old) patients hospitalized from January 1, 2012 to December 31, 2012 who were on vancomycin therapy for at least 72 hours. Patients were excluded if they were on vancomycin for pre- and post-operative prophylaxis, were prescribed vancomycin for ≤ 48 hours, did not have both serum and trough concentrations measured, or have end stage renal disease (ESRD) on hemodialysis, peritoneal dialysis, or continuous renal replacement therapy (CRRT). Baseline characteristics collected include patient’s weight (ABW, AdjBW, DW, and Ideal Body Weight (IBW)), serum creatinine, BMI, comorbidities, and concomitant nephrotoxic medications. Primary outcome is to compare extrapolated Vd from measured serum concentration against DW-, AdjBW-, IBW-, and ABW-based Vd. Secondary outcomes include in-hospital mortality and observed nephrotoxicity.

Results and Conclusion:
Will be presented

ACPE #:0126-9999-13-435-L01-P
Learning Objectives:
- Describe the most appropriate volume of distribution for dosing optimal vancomycin concentrations.
- Describe the most appropriate vancomycin dosing strategy for patients with BMI ≥ 30 kg/m2.

Both statin and fibrate monotherapy are known to increase the risk for myotoxicity, however, this risk is potentiated when these agents are administered concomitantly. These muscle-related adverse effects include myalgias, myopathy, and rhabdomyolysis, which although rare, may cause acute renal failure and death. The potential for myotoxicity is increased 15-fold with gemfibrozil compared to other fibrates when taken in combination with a statin. However, omega-3 fatty acids in combination with a statin do not increase the risk for myotoxicity, and can decrease triglyceride levels by up to 20-45%. As a result, a Southern California Regional Safety Net Program was created at Kaiser Permanente to reduce the risk of this potentially harmful drug-drug interaction. In this program, patients taking a gemfibrozil/statin combination were identified for a pharmacist intervention. An intervention consisted of the selection of an alternative triglyceride-lowering agent depending on the patient’s triglyceride level and renal function. Patients on statins with elevated triglyceride levels were treated with over-the-counter fish oil, fenofibrate, or gemfibrozil.

This retrospective observational study evaluated the outcomes of a regional safety net program that attempted to reduce the number of patients on a gemfibrozil and statin combination. The objective of this study was to evaluate the change in triglycerides for all patients who underwent a gemfibrozil-statin intervention. Utilizing electronic medical records from January 1, 2012 to December 31, 2012, patients ≥18 years of age taking a statin and gemfibrozil were identified for inclusion in the Safety Net Program. The primary endpoint was the change in triglycerides 6 weeks post-intervention. Secondary endpoints included determination of the number of patients converted to over-the-counter fish oil and then switched back to gemfibrozil or fenofibrate. This study provides data on the impact pharmacists have in optimizing safety and minimizing preventable adverse effects of statins in combination with gemfibrozil. In addition, these results provide insight on the triglyceride-lowering effects of over-the-counter fish oil and fenofibrate as safer alternatives to gemfibrozil in the setting of concomitant statin administration. The study results and conclusions will be presented.

ACPE #:0126-9999-13-436-L01-P
Learning Objectives:
- Describe the impact of a gemfibrozil/statin safety net program under a pharmacist-managed protocol in reducing potentially dangerous combinations of gemfibrozil and statins.
- Describe the triglyceride-lowering effects of over-the-counter fish oil and fenofibrate as safer alternatives to gemfibrozil in the setting of concomitant statin administration.

Purpose
Recently, the University of Washington Medical Center (UWMC) Department of Pharmacy Services has extended clinical pharmacy coverage by piloting an evening “on call” program where pharmacy residents are each assigned a week of evening coverage in rotation, which counts as part of their integrated service commitment. By extending clinical pharmacy coverage, UWMC is able to more readily meet the demands of patients and providers in a timely manner, assist with complex medication issues and questions, and provide a variety of medication teaching services. The objective of this study is to assess the impact of extending hours of clinical pharmacy service.

Methods
From October 2012 to February 2013, this study will evaluate the impact of extending hours of clinical pharmacy services by: quantifying and qualifying interventions made by clinical pharmacy staff (including clinical pharmacists, pharmacy residents, and pharmacy interns), evaluating the outcomes of these interventions on department measures, and measuring staff satisfaction. An intervention tracking sheet will be created and reviewed in order to identify patients for additional chart review. Direct observation will also take place to verify volume and accuracy of interventions recorded. The following data will be collected: interventions (type, time spent, medical service, medication error identified, etc.), number of patients counseled, readmission rates (within patients counseled), hours staffed, and department measures (such as essential services scores, HCAHPs, CORE measures). To measure staff satisfaction, a survey will be administered prior to and at the end of the designated study period. This study will be submitted to the Institutional Review Board for approval prior to commencement.

Results:
Results are pending

Conclusion:
Conclusions are pending

ACPE #:0126-9999-13-437-L04-P

Learning Objectives:
- Describe the evening clinical coverage program at a large academic medical center.
- Discuss the successes and challenges associated with implementing an evening clinical coverage program at a large academic medical center.


428 - IMPLEMENTING AN EFFECTIVE AND COMPREHENSIVE PROSPECTIVE ANTIMICROBIAL REVIEW WITH CLINICAL PHARMACISTS

A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 9:30 AM in Garden

Introduction: In 2010, the California Department of Health developed a statewide initiative to have an Antimicrobial Stewardship Program (ASP) in healthcare facilities. Washington Hospital Healthcare System (WHHS) developed an ASP to comply with this initiative. A program was developed based on the guidelines recommended by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA). During daily tasks, pharmacists make recommendations including streamlining therapy, dose adjustments, pharmacokinetic drug monitoring, and converting patient from intravenous to oral formulations. In order to enhance involvement, prospective review will be incorporated to the daily routine. The focus of the study will examine the outcomes after implementation of a more comprehensive prospective review of antimicrobial therapy. In addition to daily tasks, recommendations will include antimicrobial streamlining, determining duration of therapy, minimizing broad-spectrum antimicrobial use, and minimizing adverse drug events.

Methods: All of the pharmacists at WHHS will be given in-house guidelines for antimicrobial therapies for specific disease states including community acquired pneumonia, urinary tract infections, skin and soft tissue infections, and catheter related bloodstream infections. These guidelines will emphasize appropriate antimicrobial selection, aim to decrease bacterial resistance, and minimize cost. Pharmacists will generate a daily antimicrobial report and after reviewing the patient’s clinical history, will make their recommendations to the physicians who will either accept, deny, or request for further consult. The recommendations will be captured via an ASP approved chart note or documented in the hospital’s order entry system. The primary outcome is to compare overall duration of therapy after implementing prospective review. The secondary outcomes will compare antimicrobial streamlining, prompt discontinuation, patient outcomes, and Clostridium difficile rates prior to implementation in patients with community acquired pneumonia and urinary tract infections since these are the most common admissions at WHHS. A random retrospective chart review from the previous quarter of patients diagnosed with an infection will be considered the control group. The project was approved by the WHHS Institutional Review Board.

Results & Conclusion: To be presented.

ACPE #:0126-9999-13-438-L01-P

Learning Objectives:
- To describe the impact clinical pharmacists can have after implementing a program focusing on prospective review of antimicrobial therapy.
- To describe the successes and challenges of implementing a program focusing on prospective review at a community hospital


429 - EFFECTS OF A HAP/VAP/HCAP TREATMENT PROTOCOL IN THE ICU ON TREATMENT PRACTICES, PATIENT OUTCOMES, AND ANTIBIOTIC COSTS

A1. Infectious Disease - Anti-infective Agents

Presented by:
Presenting on Wednesday, May 15 at 10:00 AM in Garden

Introduction:
In 2005, the Infectious Disease Society of America, in conjunction with the American Thoracic Society (IDSA-ATS) published an updated guideline on the management of hospital acquired pneumonia (HAP), ventilator associated pneumonia (VAP), and health-care associated pneumonia (HCAP). In May 2012, a new HAP/VAP/HCAP treatment protocol based off of current guideline recommendations was implemented at the Portland Veterans Affairs Medical Center (PVAMC) intensive care unit (ICU). The aim of the treatment protocol is to guide the diagnosis and treatment of HAP/VAP/HCAP. No formal training was used to disseminate this information and it is suspected that the HAP/VAP/HCAP treatment protocol is currently underutilized. The primary objective of the study is to determine if implementation of the HAP/VAP/HCAP treatment protocol has affected practice in the ICU. Secondary objectives include assessing the impact of protocol adherence on length of hospitalization, ICU length of stay, duration of mechanical ventilation, and antibiotic cost avoidance.

Methods:
Data will be analyzed for all patients diagnosed with HAP/VAP/HCAP in the ICU at the PVAMC between October 1, 2011 and December 31, 2012. Retrospective data will be retrieved from the PVAMC CPRS and VISTA medical record systems. Subjects diagnosed with HAP/VAP/HCAP in the ICU between October 1, 2011 and May 15, 2012 will serve as the pre-protocol implementation group. Subjects diagnosed with HAP/VAP/HCAP in the ICU between May 16, 2012 and December 31, 2012 will serve as the post-protocol implementation group. These two groups will be compared in order to determine if HAP/VAP/HCAP protocol implementation has altered practice. Non-adherence to the protocol is defined as one or more of the following: incorrect diagnosis, failure to attain appropriate cultures, incorrect prescribing of empiric antibiotics, inappropriate de-escalation of antibiotics, and/or inappropriate treatment duration. Regarding patient outcomes (length of hospital stay, length of ICU stay, length of time spent on a ventilator) and antibiotic costs, two groups will be compared: all patients who were treated in accordance with guideline based recommendations between October 1, 2011 to December 31, 2012, and all patients who were not treated in accordance with guideline-based recommendations between these dates.

Results and Conclusion:
Results to be presented at the 2013 Western States Conference.

ACPE #:0126-9999-13-439-L01-P
Learning Objectives:
Describe how the implementation of a HAP/VAP/HCAP treatment protocol in an ICU has affected guideline-based practice.
Explain how the implementation of a HAP/VAP/HCAP treatment protocol in an ICU has affected patient outcomes and antibiotic costs.


430 - ADHERENCE RATES AND ADVERSE OUTCOMES OF PATIENTS PRESCRIBED DABIGATRAN: COMPARING ANTICOAGULATION CLINIC VS. USUAL CARE

B1. Ambulatory Care

Presented by:
Presenting on Wednesday, May 15 at 3:00 PM in Bay View

Introduction: The FDA approval of dabigatran stemmed from the RE-LY trial in which patients were closely followed up and >95% of patients enrolled had adequate adherence defined by a Medication Possession Ratio (MPR) ≥80%. At VA Palo Alto Health Care System (VAPAHCS), dabigatran became available as a non-formulary agent to veterans on 2/28/11, but no formal monitoring process was in place. On 10/26/11, it became a formulary agent, requiring baseline labs within the first 3 months of initiation, and patients be followed-up by a pharmacist-run Anticoagulation Clinic (ACC) for 3 months due to concerns for intolerance, non-adherence, and their impact on outcomes. After 3 months, patients are discharged back to their primary care physician for anticoagulation management. Due to the lack of studies looking at real world adherence rates to dabigatran, there is a need to evaluate the impact of adherence on clinical outcomes and the optimal follow-up of these patients. A previous retrospective study at VAPAHCS compared MPR and outcomes of patients monitored by ACC pharmacists with usual care. The usual care (UC) group consisted of patients prescribed dabigatran from 2/28/11 to 10/26/11, and the ACC group consisted of patients who started dabigatran after this time period. After 3 months, the UC group (n=48) had a MPR of 88%, while the ACC group (n=20) had an MPR of 93% (p = 0.16). Both groups had similar safety and efficacy outcomes. However, significantly more ACC patients had baseline labs compared to UC (p=0.02) prior to initiation of therapy. Thus, the benefit of closer follow-up by ACC pharmacists within the first 3 months and the time period after remains unclear. The purpose of this study is to determine if the pharmacist’s efforts are making a difference on medication adherence and real world outcomes 6 months post-intervention.

Methodology: To further evaluate, a retrospective study will be performed to compare the MPRs of UC and ACC groups at 3 and 9 months after initiation of dabigatran. The aim of the study is to assess whether pharmacist interventions made an impact on medication adherence (measured by MPR) and real world outcomes (measured by thromboembolic events) 6 months after the interventions. Adherence is measured by the MPR, defined as the sum of days supply received divided by the sum of days elapsed. Patients with MPR ≥80% will be considered as being adherent, while those with MPR<80% will be deemed as non-adherent. The secondary objective is to compare major and minor bleeding rates, adverse side effects (dyspepsia, diarrhea, nausea, and upper abdominal pain), and reasons for discontinuation between each group during the 9 month period. Inclusion criteria consist of adults >18 years old newly initiated on dabigatran 150 mg BID for non-valvular atrial fibrillation. Exclusion criteria consist of patients who did not complete 9 months of dabigatran therapy, if patients crossed over to the other group, did not have a MPR at 3 and 9 months, did not finish all four ACC follow-up visits, and were hospitalized for ≥2 days.

Results and Conclusions: Will be presented.

ACPE #:0126-9999-13-440-L01-P
Learning Objectives:
  - Describe how health care providers can increase medication adherence.
  - Explain the impact of pharmacist follow-up on medication adherence and clinical outcomes.

431 - OUTCOMES OF METASTATIC RENAL CELL CARCINOMA PATIENTS WITH FAVORABLE CLINICAL AND HISTOLOGIC FEATURES TREATED WITH HIGH-DOSE INTERLEUKIN-2 THERAPY

Presented by:

Kinjal Parikh, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Sunset I

Introduction: High-dose interleukin-2 (HD-IL2) immunotherapy was approved in 1992 for renal cell carcinoma and remains one of the only agents that can provide a durable complete remission given the high frequency of disease recurrence. Administration of HD-IL2 often requires intensive inpatient support due to the high incidence of severe adverse drug events. Recently, molecularly targeted agents including sorafenib, sunitinib, temsirolimus, everolimus, bevacizumab, pazopanib, and axitinib were introduced which offer both oral and intravenous formulations with less toxicity mitigating the need for inpatient admission for administration. These targeted agents have demonstrated improved overall response rates and progression-free survival but with reduced complete and durable response rates as compared to immunotherapy. Therefore, determining patients most likely to benefit from HD-IL2 will balance the increased risk of serious adverse events with the potential for long-term benefit.

Pre-treatment factors that correlate with positive response to HD-IL2 include a higher baseline weight, no prior immunotherapy, and good performance status. Other factors that may affect response to therapy include tumor histology subtype, architectural pattern, cytoplasmic staining, lactate dehydrogenase, hemoglobin, and serum calcium. However, these latter factors are less validated in literature review.

Methods: Patients with metastatic renal cell carcinoma treated with HD-IL2 at our institution anytime between January 1, 1992 and December 31, 2012 will be evaluated for progression-free survival, overall survival, and relapse rates. Previous or subsequent therapy with tyrosine kinase inhibitors will not be an exclusion criterion. We hypothesize that the above criteria can be used to appropriately select patients most likely to benefit from HD-IL2. This is a retrospective, descriptive study identifying additional characteristics predicting complete response, partial response, and overall survival.

Results: Final results will be presented.

Conclusion: Pending study completion.

ACPE #:0126-9999-13-441-L01-P

Learning Objectives:
- Describe the role of high-dose interleukin-2 therapy in the treatment of metastatic renal cell carcinoma.
- List factors that may contribute to better outcomes with high-dose interleukin-2 therapy.

Presented by:

Ha Young Park, PharmD
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Presenting on Wednesday, May 15 at 10:30 AM in Garden

Introduction: The inappropriate usage of antimicrobials increases the prevalence of antimicrobial resistance. Due to these challenges, the appropriate choice of antibiotics is limited. When patients present with a clinical picture of sepsis, it is important to initiate broad-spectrum empiric antibiotics in a timely manner to decrease mortality. In the intensive care units (ICUs), a possible antimicrobial regimen for patients with suspected sepsis consists of vancomycin, piperacillin-tazobactam, and levofloxacin. Some studies have demonstrated that combination empiric therapy may cause more harm than benefit, including an increase in medication-associated toxicity and multi-drug resistance. This retrospective study aims to examine the validity of combination empiric antibiotic therapy in patients with sepsis in the ICU by comparing the prevalence of Gram-positive and Gram-negative isolates obtained from patients during the pre- and post-physician education conducted by a pharmacist.

OBJECTIVE: The primary objective of this study is to examine the appropriateness of empiric administration of intravenous vancomycin, levofloxacin, and piperacillin-tazobactam in critically-ill patients with sepsis in medical ICUs. The secondary objective is to analyze physicians’ prescribing patterns for empiric antibiotics (vancomycin, levofloxacin, and piperacillin-tazobactam) in patients with sepsis.

Methodology: A retrospective analysis was conducted at Loma Linda University Medical Center (LLUMC), a tertiary academic hospital. This study is a follow-up study from previous research. Patients were included if they have diagnosis of sepsis, septic shock, or septicemia according to ICD-9 codes discovered during a medical ICU admission. Investigators evaluated microbiological cultures, Gram stains, susceptibility patterns, and antibiotic class to assess appropriate use of antibiotics. Exclusion criteria included age less than 18 years, vancomycin for infective endocarditis, pre-operative prophylaxis, oral or topical vancomycin, and reported microbiological culture or Gram stain before initiation of empiric antibiotic therapies. This study consists of three of 6-month periods: (1) “Pre-educational” phase (July to December 2011) to analyze the empiric antibiotic usage prior to physician education, (2) “Post-educational” phase (January to June of 2012) to analyze empiric antibiotic usage and prescribing patterns after the physician education, (3) “Second pre-educational” phase (July to December of 2012) to analyze the impact of new medical residents at LLUMC.

Results and Conclusions: The findings of this study will be presented after completion.

ACPE #:0126-9999-13-442-L01-P
Learning Objectives:
- Describe the appropriateness of broad spectrum empiric therapy for patients with sepsis in ICU by comparing antimicrobial resistance patterns.
- Explain the impact of physician education by a pharmacist pertaining to antibiotic selection.


433 - PREVENTING READMISSIONS OF POORLY COMPLIANT DIABETIC KETOACIDOSIS PATIENTS USING A TEAM APPROACH.
B4. General Clinical Practice
Presented by:
Diana Park, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Royal III

Introduction:
Poor compliance with diabetes treatment regimens is one of the leading causes of diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS) admissions in the U.S. There are more than 500,000 hospital annual admissions related to DKA and HHS in the U.S. with a 35% annual increase in number of cases between 1996 and 2006. DKA treatment requires extensive resources with annual costs of $2.4 billion. Identification of specific precipitating factors for poor compliance and developing novel or individualized approaches to patient education, access to medications, and outpatient follow-up are strategies that may increase treatment compliance and consequently prevent DKA readmissions. The objective of this study is to determine if a structured multidisciplinary approach will decrease 30 day readmission rates for DKA/HHS.

Methodology:
This is a mixed method, quantitative and qualitative prospective research design conducted at SHARP Chula Vista, an urban community hospital in southern California. Phase I consists of a retrospective chart review of patients admitted through the SHARP Chula Vista Emergency room for DKA or HHS from January 2010 to November 2012. Patient charts will be reviewed to ascertain the precipitating causes of DKA/HHS and the rates of 30 day readmission for DKA/HHS. This group will serve as the historical control group.

Phase II consists of a prospective intervention on all patients admitted through the SHARP Chula Vista Emergency room for DKA or HHS from November 2012 to July 2013. The intervention will consist of:
- Initial review of patients to include medication reconciliation by the Emergency room team. A waiver of informed consent and authorization to private health information will be obtained at this time.
- Diabetic nurse practitioner to evaluate and alter the patient’s drug regimen in ways that may improve compliance and diabetes educator to provide intensive education and follow-up.
- Case management and social worker to review patient assistance programs to provide diabetes medications at reduced or no cost.
- Follow up call at 48 hours and 2 weeks from discharge to address diabetic self-care and medication related questions.

Results and conclusion
Will be presented

ACPE #:0126-9999-13-443-L01-P

Learning Objectives:
- List common precipitating factors that contribute to a diabetic patient’s admission into the emergency room for DKA.
- Describe the impact of a structured multidisciplinary approach and post discharge followup on 30 day readmission rates to the emergency room for DKA.

Presented by:

CIPRIAN PASCU, PharmD
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Presenting on Wednesday, May 15 at 11:00 AM in Garden

Objectives and Hypothesis: Vancomycin has a narrow therapeutic index and exhibits dose dependent toxicities, thus, dosing based on weight and renal function requires close therapeutic monitoring to ensure efficacy and minimize toxicity. Achievement of therapeutic vancomycin troughs in timely manner is correlated to improved clinical outcomes, decrease of antibiotic resistance, and decrease rate of adverse effects. The objective of this project is to implement a vancomycin per-pharmacy dosing and monitoring protocol for patients admitted at VA Puget Sound Health Care System (VAPSHCS) and to evaluate the impact of this protocol by assessing the appropriateness of therapeutic drug monitoring after protocol implementation. It is hypothesized that implementation of a pharmacist managed vancomycin dosing and monitoring protocol based on current, evidence-based practices will decrease the duration to attainment of therapeutic troughs, thus improving clinical outcomes in adult veteran patients at VAPSHCS.

Research design and Methodology: This study involves a retrospective chart review comparing patients receiving vancomycin therapy prior to the vancomycin per-pharmacy dosing protocol and after the initiation of the protocol. The current literature and active protocols at other institutions will be reviewed and utilized to design a vancomycin per-pharmacy dosing protocol. The protocol will include standard procedures for dosing, administration and monitoring of vancomycin and procedures for documentation of pharmacist activities. The protocol will be reviewed with pertinent department physicians and nurse managers and will be approved by the pharmacy and therapeutics (P&T) committee and Clinical Executive Board. Pharmacist, providers, nursing, and laboratory personnel education will be developed and presented to staff in preparation for implementation. An order set and monitoring note template will be added to CPRS, ensuring that uniform dosing and appropriate documentation will be associated with each pharmacist intervention. VAPSHCS, Seattle Division hospitalized patients requiring intravenous vancomycin therapy for confirmed or suspected gram positive bacterial infection were included in this descriptive study. Patients who receive perioperative prophylaxis with vancomycin therapy were excluded. The primary endpoint is the number of doses to the first trough drawn at steady state. The secondary endpoints are the number of doses required to achieve therapeutic trough and number of erroneous troughs drawn per patient overall. Results and conclusions will be presented.

Relevance to VA mission: The goal of this project to standardize the pharmacists’ clinical role in therapeutic drug monitoring of vancomycin and to streamline the clinical decision making in regard to vancomycin therapy in order to improve patient clinical outcomes. This may lead to increased effectiveness of therapy, increased patient safety, and cost savings associated with reducing the number of unnecessary troughs drawn and sent to lab. Additionally, this study may clarify to other VA facilities whether implementation of a vancomycin-per pharmacy protocol is beneficial, providing valuable details on appropriate implementation and evaluation for establishment of a similar program.

ACPE #:0126-9999-13-444-L01-P
Learning Objectives:
- Describe methods used for successful implementation of a vancomycin-per pharmacy protocol within a VA healthcare system.
Assess and explain the impact of a pharmacist managed vancomycin protocol on patient outcomes.


435 - YOU’VE GOT MAIL: THE EFFICACY OF A PHARMACIST RUN REFILL AUTHORIZATION REQUEST CLINIC AND THE IMPACT ON MAIL ORDER PHARMACY

B1. Ambulatory Care

Presented by:

Umang Patel, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Bay View

With an ever-expanding US population, the health care system is predicted to experience a shortage in health care professionals, primarily physicians, within the near future. In order to counter such shortages, it is imperative for hospitals and physicians to find more efficient means to deliver quality patient care. One study implemented a program where pharmacists assisted physicians with their medication prescriptions and refills. This program not only proved to be economically beneficial, but provided the physicians with less work-burden and the patients with accurate medication recommendations.

Mail order pharmacies have proven to be both economically and clinically significant. Aside from being more cost-effective, patients enrolled in mail order pharmacies have been shown to achieve a significant increase in medication adherence versus their local pharmacy use counterparts, increasing the overall control for their chronic diseases. Therefore, one ideal strategy could utilize pharmacists to manage medication therapy by authorizing patient refill requests, along with enrolling qualifying patients into mail order pharmacy.

The objective of this study is to evaluate a pharmacist-run refill authorization request clinic and the impact on mail order pharmacy. The refill authorization request clinic was piloted for patients of five primary care physicians in a family practice medicine module at Kaiser Permanente Vallejo over a 12 week period. Under directive of the Refill Authorization Request Clinic protocol, pharmacists screened medication refill requests via chart reviews to identify potential care gaps, need for blood pressure appointments, overdue laboratory work, follow up with their primary care physicians, cost saving opportunities, and any missing medications for their chronic disease states. A twelve-month supply of the medication was authorized if no pharmacist intervention was necessary. However, if an intervention was necessary, then the appropriate intervention was made and the refill was limited to a one or three-month supply. These patients were notified via a telephone call of the intervention. If a patient did not already utilize mail order pharmacy the pharmacist would extend the offer to the patient and sign up any appropriate patient. The number of pharmacist interventions made, time taken for interventions, and patients that were converted to mail-order pharmacy were measured to determine the influence of the pharmacist run refill authorization request clinic. Results and conclusions will be presented.

ACPE #:0126-9999-13-445-L04-P
Learning Objectives:

- Describe some of the common barriers in converting patients to mail order pharmacy utilization.
- Describe the types of results made from the various therapeutic interventions made by the pharmacist-run refill authorization request clinic.

INTRODUCTION: The optimal management of urinary tract infections (UTIs) caused by extended-spectrum beta-lactamase (ESBL) producing organisms is unknown. Carbapenems are generally considered the treatment of choice for infections caused by these organisms, especially in the setting of bacteremia. However, since treatment information is from studies focused on patients with bacteremia, applying the results to patients with a UTI is controversial. Carbapenems can only be administered parenterally so the use of an oral antibiotic could be advantageous because it may allow for more convenient and cost effective outpatient management. The purpose of this study is to determine if oral antibiotic therapy (e.g., fluoroquinolones, nitrofurantoin, or trimethoprim/sulfamethoxazole [TMP/SMX]) is appropriate for the treatment of a UTI caused by an ESBL producing organism when culture results demonstrate in vitro susceptibility. Findings of this study may help develop care standards and best practices for patients with UTIs caused by ESBL producing organisms.

METHODOLOGY: This is a retrospective cohort study of Kaiser Permanente Colorado (KPCO) patients with a UTI caused by an ESBL producing Escherichia coli or Klebsiella pneumonia with in vitro susceptibilities to a fluoroquinolone, TMP/SMX, and/or nitrofurantoin from December 6, 2009 to December 5, 2011. Clinical outcomes will be compared in patients treated with a (1) carbapenem, (2) oral antibiotic with in vitro susceptibility, and (3) oral antibiotic without in vitro susceptibility or patients treated with nitrofurantoin with a CrCl ≤ 60 mL/min. Primary study endpoint is 6-month relapse and reinfection rates. Data collection will occur by manual chart review of the patient’s electronic medical record using a standardized data abstraction form. Data collected will include: baseline demographics, urine culture results, empiric and culture-driven antibiotic selection, and major adverse events. Descriptive and inferential statistics will be performed using SAS 9.1 (Cary, NC, USA) for data analysis.

RESULTS/CONCLUSION: Preliminary results will be presented.

ACPE #:0126-9999-13-446-L01-P

Learning Objectives:
- Describe the current management of urinary tract infections caused by extended-spectrum beta-lactamase infections at Kaiser Permanente Colorado
- Describe differences in 6-month relapse and reinfection rates in patients treated with a carbapenem versus an oral antibiotic for treatment of a urinary tract infection caused by extended-spectrum beta-lactamase Escherichia coli or Klebsiella pneumoniae

437 - THE IMPACT OF INTEGRATED CLINICAL PHARMACY SERVICES ON DIABETES COMPOSITE MEASURES

B1. Ambulatory Care

Presented by:

Tina Patel, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Bay View

The Patient Protection and Affordability Care Act (PPACA) is shifting healthcare from fee-for-service to value-based reimbursement through accountable care organizations (ACOs). New, broader, and more meaningful measures of healthcare quality have been developed to measure the performance of ACOs including "composite measures", a single score derived from the combination of more than one quality measure. Clinical pharmacists are able to manage medication therapy for all common chronic illnesses and many studies have demonstrated the impact of the pharmacist on specific conditions. However, no study has reported the impact of clinical pharmacy services on composite measures for chronic illnesses in a safety net population. The purpose of this study is to evaluate the quality of diabetes care provided by clinical pharmacists integrated in a safety net clinic compared to standard medical care using composite measures. The composite measures, as defined by the Center for Medicare and Medicaid Services, include a measure for blood sugar control or poor blood sugar control, cholesterol management, blood pressure control, appropriate use of aspirin, and tobacco use. This retrospective study evaluated diabetes patients who received care from a physician or a pharmacist through a network of urban safety net clinics between January 2009 and December 2011. The study had two arms—(1) diabetes patients receiving care from physicians who never send referrals to clinical pharmacy services, and (2) diabetes patients who are co-managed between a physician and clinical pharmacist. Data collected from patient electronic health records (EHR) included A1C, low-density lipoprotein cholesterol, serum creatinine, urine albumin:creatinine ratio, body mass index, blood pressure, demographics, diagnosis codes, medications, and number of pharmacy or physician visits annually. The primary outcome is attainment of composite measures ("all or none"). The secondary outcome is the determination of predictive indicators of composite measure control, including those who fulfill all 5 of the composite measure criteria versus 4 (not including aspirin use). Data will be analyzed through the Statistical Analysis System (SAS). Results and conclusions will be presented.

ACPE #:0126-9999-13-447-L01-P
Learning Objectives:
   - Explain how composite measures can help improve quality of care in disease state management.
   - Describe the differences in diabetes management between clinical pharmacists and standard medical care.


438 - PREDICTIVE MONITORING OF SERUM TRACE MINERAL CONCENTRATIONS IN PARENTERALLY FED PEDIATRIC PATIENTS

A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:
Irasema Paul, PharmD
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Presenting on Tuesday, May 14 at 3:00 PM in Mission Bay Foyer

Introduction:
Trace minerals are essential for growth and good health. Children receiving parenteral nutrition (PN) are at an increased risk of receiving inadequate or excessive supplementation of trace minerals such as zinc (Zn), copper (Cu), manganese (Mn), selenium (Se), and iodine (I).

Recent drug shortages have required the restriction of trace minerals in TPN leaving pediatric patients at risk for trace mineral deficiencies. These shortages have made it necessary to prioritize which patients should receive trace minerals in their TPN. The ability to predict when trace minerals may be low or high via common lab draws could aid in determining the optimal time frame to check trace mineral levels and when to add or withhold supplementation. For example, increases in C-reactive protein (CRP), an acute phase reactant, has been associated with decreased zinc levels and increased copper levels. Decreased levels of alkaline phosphatase can also indicate a reduced serum zinc level.

Patients on TPN are at risk for developing cholestasis, a condition in which the flow of bile from the liver is decreased. Liver function panel, a common lab draw, includes levels of conjugated bilirubin that are often used to diagnose and monitor cholestasis. Copper and manganese are stored in the liver and it is postulated that increased levels of conjugated bilirubin could increase copper and manganese levels.

Iodine needs to be supplemented at regular intervals in small doses, but it is not usually included as a supplement in parenteral nutrition. The highest concentrations of iodine are found in the thyroid. Iodine levels can be correlated to thyroid function, so by evaluating thyroid stimulating hormone (TSH) and free T4 levels a practitioner could determine if supplementation is necessary.

Selenium is found throughout the body with the highest concentration found in the kidneys. Serum creatinine (Scr) is a known method of evaluating kidney function. Correlation of kidney function via Scr along with selenium levels could predict when selenium would need to be supplemented.

Methods:
A retrospective chart analysis will be performed including patients at Primary Children’s Medical Center from 2005 to present who are NPO and receive PN. Patients who receive PN and have at least one trace mineral level will have medical charts checked for a corresponding laboratory levels of CRP, total and conjugated bilirubin, serum creatinine, thyroid stimulating hormone, cortisol or free T4. Evaluated levels must be drawn within 72 hours of the trace mineral level. Using national standards, trace mineral levels will be categorized as low, in range or high. Zinc, copper and manganese will be compared to the CRP level. Zinc is further compared with alkaline phosphatase to determine if there is a correlation with Zn levels. Copper and Manganese will be compared to conjugated bilirubin. Selenium levels will be compared with creatinine and Iodine will be compared with TSH, and T4. All trace mineral comparatives will be analyzed to determine if there is a correlation between the comparatives and if that correlation is statistically significant.

Results:
To be presented.

ACPE #:0126-9999-13-448-L01-P

Learning Objectives:
1. Describe the role of trace minerals in nutrition and growth.
2. Explain the utility of using predictive monitoring for trace mineral level in patients receiving PN.

439 - STANDARIZATION OF CHEMOTHERAPY DOSING IN THE OBESE POPULATION: A PILOT IMPLEMENTATION

A2. Oncology - Anti-neoplastic and Non-antineoplastic

Presented by:

Jillian Paxton, PharmD
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Presenting on Wednesday, May 15 at 1:30 PM in Sunset I

The increased prevalence of obesity in the United States has become an emerging challenge for health care providers when dosing medications. Concern for appropriate dosing of antineoplastic agents in these patients prompted the American Society of Clinical Oncology (ASCO) to develop guidelines for appropriate dosing of chemotherapy in obese oncology patients. At Oregon Health & Science University (OHSU), dosing of chemotherapy agents in obese patients is left to the discretion of the prescriber. The purpose of this research project was to determine OHSU’s compliance with recent dosing guidelines and create a strategy to standardize future dosing among all obese oncology patients.

The primary objective of this study was to determine the current practice for dosing chemotherapy in obese patients at OHSU and to develop evidence based algorithms using a standardized dosing weight for select antineoplastic agents. The preliminary analysis was a retrospective chart review of all chemotherapy agents prescribed between December 2010 and November 2012 using the electronic medical record. Patients included in the analysis were greater than age 18 years old, were receiving chemotherapy for treatment of a malignancy, and had a calculated body mass index greater than or equal to 30. Patients were excluded if they received chemotherapy for non-malignant conditions or as a conditioning regimen for bone marrow transplant. The secondary objective of the study was to standardize dosing strategies for obese patients through implementation of evidence based dosing algorithms. To determine acceptance of standardize dosing strategies; a subsequent retrospective analysis will be conducted post implementation of the algorithms. Reported outcomes measured for this study included percent compliance with ASCO guidelines before and after implementation of prescriber education. Select antineoplastic agents in this pilot implementation included cyclophosphamide, fluorouracil, anthracylines, and taxanes. Results and conclusions of this study will be presented.

ACPE #:0126-9999-13-449-L01-P
Learning Objectives:

- Explain appropriate dosing of antineoplastic agents in obese patients based on the 2012 ASCO guidelines.
- List the antineoplastic agents targeted at OHSU for development of evidence based algorithms to be used during the pilot implementation.


440 - EVALUATION OF THE INCIDENCE OF HYPOCALCEMIA DURING TREATMENT FOR DIABETIC KETOACIDOSIS (DKA) IN PEDIATRIC PATIENTS

A6. Diabetes Care - Diabetes Agents and Devices
Introduction
Phosphorus supplementation has routinely been a part of guidelines for treatment of DKA in both children and adults, with the intent being prevention of insulin-induced hypophosphatemia. However, there are no studies demonstrating a beneficial effect of phosphate supplementation on outcomes in DKA. Hypocalcemia is a known adverse event associated with phosphate supplementation. Additionally, the true incidence of hypocalcemia during the course of DKA treatment has not yet been examined. Information regarding the risk of hypocalcemia could impact recommendations regarding phosphate supplementation in DKA.

Methodology
This is a retrospective, cohort study of pediatric patients who presented to the emergency department with a diagnosis of DKA. The primary outcome is the incidence of hypocalcemia in our study population. The secondary outcome is the identification of factors associated with hypocalcemia. Patients younger than 18 years of age who presented to the University of Arizona Medical Center emergency department with a diagnosis of diabetic ketoacidosis (DKA) between 9/1/2009 and 9/30/2012 and remained admitted for at least 24 hours after diagnosis were included. Patients who did not receive phosphate supplementation during the course of treatment for DKA were excluded. Data collection includes basic demographics, type and amount of fluids and electrolytes given, rate and duration of insulin infusions, initial blood glucoses, time to resolution of DKA, relevant electrolyte trends throughout treatment, and incidence of hypocalcemia and other DKA-related complications. Normal lab values have been defined by institution-specific assays, which are adjusted for patient age. The incidence of hypokalemia and resulting outcomes will be reported descriptively. Univariate and multivariate logistic regression analyses will be conducted to identify predictors of hypocalcemia. All data analyses will be conducted using STATA version 11.2.

Results
Will be presented.

Conclusion
Will be presented

ACPE #:0126-9999-13-450-L01-P
Learning Objectives:
- Describe the incidence and consequences of hypocalcemia in pediatric patients during treatment for DKA.
- Explain factors that are associated with hypocalcemia.


441 - EFFECT OF THROMBOCYTOSIS ON VENOUS THROMBOEMBOLISM RISK IN AMBULATORY PANCREATIC CANCER PATIENTS RECEIVING CHEMOTHERAPY
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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**Presenting on Wednesday, May 15 at 2:00 PM in Sunset I**

**Introduction:** Interest in multifactorial venous thromboembolism (VTE) risk-stratification tools for cancer patients continues to grow, but clinical and laboratory parameter components require further characterization in high-risk groups. Thrombocytosis is a common paraneoplastic sequela of various malignancies which independently portends increased VTE risk in mixed cancer populations, where wide variability exists in the intrinsic VTE risk of each cancer type. These findings support the inclusion of thrombocytosis in recently-developed, cancer-specific VTE-risk-stratification tools. In pancreatic adenocarcinoma patients receiving chemotherapy, a more homogenous group with at least 4- to 7-fold higher baseline VTE risk versus other adenocarcinoma types, the effect of thrombocytosis on VTE incidence is unknown. Recent studies in ambulatory pancreatic cancer patients receiving chemotherapy demonstrate a significant mitigation of VTE rates with primary low-molecular weight heparin prophylaxis (number needed to treat ≈ 5.1 to prevent a VTE event within 100 days of chemotherapy initiation); however, concerns over cost, morbidity, and lack of mortality benefit preclude universal application in this population. Characterization of reliable risk-stratification parameters (including thrombocytosis) for VTE in pancreatic cancer patients would allow selective prescribing of medical prophylaxis only when benefit-risk ratios appear favorable, potentially avoiding futility and unnecessary risk.

**Methods:** Pancreatic adenocarcinoma patients who received chemotherapy for advanced or metastatic disease from January 1, 2002 through present will be retrospectively reviewed. Platelet levels will be assessed for each patient and thrombocytosis (defined as platelet count ≥443k/mcL in this study) will be documented if measured within one month prior to chemotherapy initiation, six months after completion, or any time amidst chemotherapy cycles. The time to VTE will be assessed from one month prior to first chemotherapy and patients will be censored at time of death or six months after completion of chemotherapy (whichever is sooner). Log-rank test will be used to compare risk of VTE in patients with and without thrombocytosis. A Cox model will be used to assess risk of VTE in relation to thrombocytosis and other selected risk factors for cancer-related VTE including older age, obesity, anemia, recent surgery or hospitalization, shorter time since diagnosis, metastatic disease, high histologic grade, elevated pre-chemotherapy leukocyte count, blood type A, and use of an erythropoiesis-stimulating agent. Secondary outcomes will include rate of primary chemical VTE prophylaxis in the ambulatory pancreatic cancer population at the study institution and relative risk of VTE with sustained thrombocytosis (≥2 measurements >443k/mcL at least 1 week apart) versus isolated thrombocytosis (only 1 measurement >443k/mcL) during the assessment period. Results: Feasibility queries suggest at least 20% of pancreatic cancer patients at the study institution have at least one incident of thrombocytosis. A separate query suggests approximately 17% of pancreatic cancer patients have at least one documented incidence of VTE by ICD-9 diagnosis codes. Timing and overlap of these events remains to be determined. Results will be discussed once data analysis is complete.

**Conclusion:** Pending study completion.

**ACPE #:0126-9999-13-451-L01-P**

**Learning Objectives:**
- List clinical and laboratory risk factors for cancer-related venous thromboembolism (VTE).
- Explain how VTE-risk-stratification tools based on clinical and laboratory parameters will help select pancreatic cancer patients for primary VTE prophylaxis.

The purpose of an antimicrobial stewardship program is to promote the appropriate use of antimicrobials. This is accomplished by establishing prescribing requirements, use of standardized antibiotic order forms, interprofessional collaboration, and other means to ensure teams are using the correct antimicrobial agent at the correct dose for the correct duration of therapy and via the correct route of administration. These programs are designed to improve patient outcomes with the most cost-effective therapy, while reducing toxicity and preventing antimicrobial resistance. In 2006 the state of California passed a law requiring all acute care hospitals to “monitor and evaluate the utilization of antibiotics and charge a quality improvement committee with the responsibility for oversight of the judicious use of these medications”. It is well known that antimicrobial stewardship program implementation in larger hospitals improves patient outcomes and decreases cost. However, the efficacy of implementation and utilization of antimicrobial stewardship programs in smaller hospitals has not been well studied. In the limited reports available there are recommendations concerning changes that can be made to the antimicrobial stewardship program in facilities where resources are limited, including the lack of infectious disease trained personnel.

This study will investigate the impact on patient outcomes following implementation of an antimicrobial stewardship program at Sutter Davis Hospital, which is a 48 bed community hospital with a six bed ICU and 25 bed med/surge unit. Sutter Davis does not have an infectious disease trained physician or pharmacist at the hospital. The antimicrobial stewardship program utilizes computer software that identifies areas for interventions that are reviewed by a pharmacist daily and include: antibiotics with positive cultures, cefepime/vancomycin/Zosyn/Imipenem use greater than 7 days, non-ICU patients on linezolid, greater than 3 antibiotics for greater than 3 days, vancomycin/aminoglycoside monitoring report with levels, and IV to PO reports. Lab data with cultures and sensitivities are also reviewed daily. Primary endpoints of this study will include length of stay and adverse events attributed to antimicrobials. The secondary endpoints will be 30 day readmission rate and cost of antimicrobials. Data will be collected retrospectively following patient discharge. Charts of adult patients admitted with a diagnosis of sepsis during the 2 month period following the implementation of the antimicrobial stewardship program, from December 1, 2012 to January 31, 2013, will be reviewed. Endpoints will be compared to similar patients hospitalized prior to the antimicrobial stewardship program to determine if implementation of the antimicrobial stewardship program in this hospital results in improved efficacy and cost benefit of antimicrobial use. The results and conclusions of the study will be presented.

ACPE #:0126-9999-13-452-L01-P
Learning Objectives:
1. Describe the impact of an antimicrobial stewardship program in a small community hospital.
2. List methods to implement an antimicrobial stewardship program in a small community hospital where resources and training are limited.

Background
Stanford Hospital and Clinics currently utilizes five different preparative regimens for patients with lymphoma undergoing autologous hematopoietic stem cell transplants (HSCT). These protocols include total body irradiation as well as agents like gemcitabine, vinorelbine, carmustine, etoposide, and cyclophosphamide that can cause mucositis, nausea, vomiting, and diarrhea. As a result of these toxicities, patients can require total parenteral nutrition (TPN) in order to obtain adequate nutrition. Even though TPN usage may benefit the nutritional status of these patients, it may also present the risk of complications like bloodstream infections, hyperglycemia, and electrolyte disturbances. Currently, significant differences in opinion exist between attending physicians as to the utility of TPN in this unique patient population. Some physicians believe it has benefits on length of stay, while others believe these patients do not experience significant mucositis warranting TPN. The purpose of this project is to investigate the potential benefits and risks of utilizing TPN in lymphoma patients receiving autologous HSCT as well as to help standardize the prescribing of TPN for these patients at Stanford.

Methods
A retrospective chart review will be utilized to assess these risks and benefits in patients with relapsed Non-Hodgkin’s Lymphoma who presented for HSCT over a one-year period. Endpoints to be assessed include difference in length of stay, length of stay post-engraftment, severity and duration of mucositis, as well as the incidence of bloodstream infections between patients who received TPN and those who did not.

Results and Conclusions
To be presented.

ACPE #:0126-9999-13-453-L01-P
Learning Objectives:
- Describe the effect of TPN use on length of stay in patients undergoing autologous stem cell transplant for Non-Hodgkin’s Lymphoma
- Describe potential risks of TPN use in this patient population

In March 2012, Providence St. Peter Hospital and Providence Centralia Hospital implemented a new electronic medical record (EMR) that integrates all patient related functions into one system. In an effort to design a new medication reconciliation process with the new EMR, pharmacy department identified an opportunity to collaborate with healthcare providers. The primary objective of the project is to implement a multidisciplinary approach for electronic medication review, targeting heart failure patients, prior to admission. Our goals are to enhance patient care by increasing the number and accuracy of medication lists reviewed prior-to-admit (PTA), reduce the time spent on discharge medication review, and increase providers’ satisfaction by having a pharmacist assist with the process. The impacts of admission medication review within 24 hours from admission will be evaluated by retrospectively compare data prior and post implementation of the project. Comparative count of medications reviewed, discrepancies found, and time spend on medication review at discharge between prior and post project implementation will be used to assess the value of technicians and pharmacists assisting in the new medication reconciliation process. Change in healthcare providers’ satisfaction with the medical reconciliation process will be measured based on an anonymous survey post project’s implementation. Data collection is being conducted. Results and conclusions will be presented.

ACPE #:0126-9999-13-454-L01-P
Learning Objectives:
- Describe the role of admission medication review by technicians and pharmacists and its impact on transition of care.
- Describe the process, benefits, and pitfalls of implementing a technician driven admission medication review, utilizing an electronic medication system.


445 - IMPROVING PATIENT SAFETY THROUGH EVALUATION OF INPATIENT PHARMACIST-INVOLVED MEDICATION ERRORS
D1. Medication Safety

Presented by:

Julie Pham, PharmD
Long Beach Memorial Medical Center
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Presenting on Wednesday, May 15 at 2:00 PM in Palm I

Background: From prescribing to administering, every step of the medication use process is susceptible to errors. Due to their extensive role in the medication use process, it is inevitable that pharmacists are involved in medication errors. By having a better understanding of situations that increase the likelihood of errors, strategies can be developed to reduce the potential for future errors.
Objectives: The aim of this study is to examine inpatient pharmacist-involved medication errors that occur at Long Beach Memorial Medical Center and Miller Children’s Hospital. This study classifies the types of medication errors and identifies potential risk factors that are associated with the occurrence of medication errors. The results of this study may lead to the implementation of strategies to prevent future incidents in order to provide better patient care and ensure patient safety.

Methods: A retrospective, descriptive review was conducted on pharmacist-involved medication errors that occurred at Long Beach Memorial Medical Center and Miller Children’s Hospital from September 2011 through September 2012. For the purposes of this study, a pharmacist-involved medication error is defined as an error committed by or passed through review by a pharmacist that leaves the pharmacy and may or may not reach the patient. Medication errors were categorized as one of the following: prescribing, transcribing, dispensing, documenting, and monitoring. Administration errors generally do not involve pharmacists and were excluded from this study. Associated risk factors of the medication errors were also evaluated and categorized as patient risk factors, medication risk factors, pharmacist risk factors, or organizational systems risk factors.

Results and Conclusions: To be presented

ACPE #:0126-9999-13-455-L05-P

Learning Objectives:

- List the different types of inpatient pharmacist-related medication errors and associated risk factors.
- Describe potential strategies for preventing future medication errors.


446 - ANALYSIS ON THE IMPACT OF A PHARMACY-DRIVEN PROTOCOL USING PROCALCITONIN LEVELS FOR ANTIMICROBIAL THERAPY OPTIMIZATION

A1. Infectious Disease - Anti-infective Agents

Presented by:

Christine Pham, PharmD
MultiCare Health System
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Presenting on Wednesday, May 15 at 1:30 PM in Garden

BACKGROUND: Procalcitonin (PCT) serves as a useful biomarker with specificity for systemic inflammation with a bacterial etiology. This biomarker has generated interest for its potential utility in several clinical settings and has been used sporadically at our institution. One potential use is to assist with the de-escalation of antimicrobial therapy in the absence of bacterial infection. The objective of this study is to determine the impact of a pharmacy protocol to assist in antimicrobial de-escalation using PCT levels.

METHODS: This study took place at a 400-bed, private, non-profit acute tertiary center between January and April 2013. A protocol identifying patients most likely to benefit from the use of PCT levels in the management of antibiotics and allowing a pharmacist to order PCT levels was developed and approved by the Pharmacy and Therapeutics Committee. Criteria included targeted antibiotic regimens in patients with respiratory tract infections (RTI). Medical and pharmacy staff were educated to the protocol and role of PCT in the setting of antimicrobial management. Daily reports were generated from the hospital’s electronic medical record to identify potential patients who might benefit from PCT levels. Patients in the study included hospitalized patients older than 18 years of age and eligible under the criteria of the protocol. PCT levels were utilized in two manners: (1) single PCT values were performed for clinically stable patients with suspected RTI who lacked
evidence for a bacterial etiology and (2) trending PCTs were performed for patients who have overwhelming evidence for bacterial RTI within 24 hours of presentation without another source of infection and subsequently for clinically stable patients who were adequately treated. A pre-post analysis evaluating the effect of the protocol was performed. Endpoints included average antibiotic use and duration, rate of PCT use in the hospital, 30-day hospital re-admissions, pharmacist interventions, and rate of physician acceptance of pharmacy recommendations. This study was an institutional performance improvement initiative exempt from approval by the Institutional Review Board.

RESULTS AND CONCLUSIONS The findings of this study will be presented after completion.

ACPE #:0126-9999-13-456-L01-P
Learning Objectives:
- Identify the procalcitonin cutoff values that demonstrated an increased likelihood of bacterial respiratory infections.
- Describe the role of procalcitonin in antibiotic de-escalation for patients with respiratory infections.


447 - DEVELOPMENT AND IMPLEMENTATION OF A PHARMACIST-LED CORONARY ARTERY DISEASE MANAGEMENT PROGRAM

B1. Ambulatory Care

Presented by:
Kaylyn Pham, PharmD
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Presenting on Wednesday, May 15 at 5:00 PM in Bay View

Introduction:
Studies published in the literature have established the value of pharmacist-managed programs showing improvement in both medication compliance and patient outcomes. Studies have also demonstrated reductions in healthcare associated costs partly due to decreases in hospital admissions for patients with chronic conditions such as diabetes, dyslipidemia, anticoagulation therapy, and congestive heart failure. Pharmacist directed medication management programs at Desert Oasis Healthcare (DOHC) including diabetes, anticoagulation, and hepatitis C have shown positive improvements in patient outcomes. In particular, the diabetes management program has shown statistically significant reductions in utilization. With this proven success, we predict similar outcomes will be seen for our Coronary Artery Disease (CAD) program.

The readmission rate, nationally, according to the Centers for Medicare and Medicaid Services (CMS) is 21%. Currently, DOHC’s all cause readmission rate is approximately 12%, with the majority of these readmissions due to cardiac complications. Under our current practice, patients with CAD are assigned telephonic case managers who focus on management of patient symptoms. It is the goal of the Medication Management Coronary Artery Disease Program (MMCAD) to ensure patient’s medications and dosages are optimized based upon symptomatology and laboratory markers, while ensuring medication compliance to help reduce hospital readmissions.

Methodology:
Patients with a diagnosis of coronary artery disease are referred to medication management to be followed by a pharmacist. The collaborative practice agreement for CAD was written in accordance with current practice
guidelines; including the following: American Heart Association/American College of Cardiology (AHA/ACC), the American Diabetes Association (ADA), the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), and Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III-ATP III).

Results:
Full scale implementation began February 21, 2013. Thus, no patient data is available at this time.

Conclusion:
Without any results at this time, the conclusion is still pending.

ACPE #:0126-9999-13-457-L01-P
Learning Objectives:
• Describe the current management of CAD patients and their readmission rates.
• Describe the proposed protocol for pharmacists management of patients with CAD.


448 - EVALUATION OF ARGATROBAN USE IN PATIENTS WITH SUSPECTED HEPARIN-INDUCED THROMBOCYTOPENIA.
B4. General Clinical Practice

Presented by:
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Presenting on Wednesday, May 15 at 10:00 AM in Royal III

Introduction: Argatroban is a direct thrombin inhibitor that is indicated and FDA-approved for anticoagulation as an alternative to heparin in patients with heparin-induced thrombocytopenia (HIT). Argatroban is currently not FDA-approved for any other indications. The platelet factor 4 (PF4)-heparin polyspecific ELISA is a diagnostic antibody test that is used in patients with suspected HIT. Thus, according to the UCLA Health System’s anticoagulation policy, argatroban should be discontinued once HIT antibody test results are negative.

Methodology: An observational, retrospective chart review of 69 patients was conducted to assess for the appropriate use of argatroban over a 12-month period according to the UCLA Health System’s anticoagulation policy. If a patient continued to receive argatroban after having a negative or weakly positive HIT antibody test result (optical density in the range of 0.40 and <1.00), the patient will be assessed for low, intermediate, or high probability of HIT based on calculation of the 4 T’s score. Appropriate use will be defined as argatroban prescribed for a patient with a strongly positive (O.D. ≥1.00) HIT antibody test result or high clinical probability of HIT (4 T’s score of 6 to 8).

Given the high cost of argatroban, the study will also determine the potential cost-savings if the pharmacy department promptly alerted physicians of negative HIT antibody test results and recommended discontinuation of the drug. A potential cost-savings will also be assessed if the HIT antibody test was conducted every 12 hours rather than the current 24-hour time period, thus releasing test results sooner and possibly leading to more timely discontinuation of argatroban.

Results and Conclusion: Will be presented upon completion of the study.

ACPE #:0126-9999-13-458-L01-P
Learning Objectives:

1. Describe the laboratory values and clinical presentations that are present in heparin-induced thrombocytopenia.
2. Identify possible pharmacy-driven interventions and cost-saving strategies to limit overdiagnosis of HIT and inappropriate use of argatroban.


449 - EVALUATION OF PHARMACIST INVOLVEMENT ON A RAPID RESPONSE TEAM AT A TERTIARY CARE ACADEMIC MEDICAL CENTER

B3. Critical Care

Presented by:

David Phan, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Executive 715

Cardiac arrests in hospitals are usually preceded by signs of patient deterioration, and early recognition and treatment can reduce death rates. At Cedars-Sinai Medical Center (CSMC), the medical emergency team, or "Rapid Response Team" (RRT), initiative is aimed at expediting rescue to patients who require urgent response for changes or deterioration in condition. Currently, the team is comprised of physicians, crisis nurses, respiratory therapists, and electrocardiograph (ECG) technicians. The process generally begins with a nurse's evaluation of a patient and identification of a specific trigger for activation of the RRT. The nurse activates the rapid response system by contacting the communications operator, who will then notify all members of the RRT through a cellphone with push-to-talk and paging functionality. The operator also delivers a notification over the hospital's intercom system, mainly aimed at promoting RRT use.

The pharmacist's role as a first responder in cardiopulmonary resuscitation (e.g. “Code Blue” response teams) has been well described and has been found to significantly reduce mortality. Thus, pharmacists currently participate as Code Blue first responders at CSMC. However, pharmacist participation as a RRT first responder is based on the pharmacist’s availability on the unit and is not routine. Pharmacists as first-responding members of the RRT could provide timely expertise to identify medication-related adverse events, optimize pharmacotherapy, and facilitate medication procurement during these medical emergencies. The primary objective of this study is to evaluate the impact of pharmacists on medication therapy when assigned as first-responding members during medical emergencies at CSMC.

This is a single-center, cohort study conducted from December 1, 2012 to February 1, 2013. Two cohorts, consisting of 30 cases each, were compared to determine whether a pharmacist’s participation as a RRT first responder would demonstrate any benefit on medication therapy. The first cohort was comprised of rapid response cases where a pharmacist was not included as a first responder. In the second cohort, a pharmacist was assigned to participate as a first responder for rapid response cases throughout the medical center. The primary endpoint for both cohorts was the rate of identification and resolution of medication-related adverse events. Secondary endpoints that were compared between the two cohorts included: medication-related management changes within the first hour and 24 hours following the RRT call. For both cohorts, delayed changes in medication regimens beyond the first hour following the RRT call were considered potential missed opportunities for first-responding pharmacist interventions. Other metrics measured in the second cohort included: the time to pharmacist arrival, duration of pharmacist participation, and the number and types of
pharmacist services provided during the rapid response. Data analysis is being conducted and the results will be presented at the Western States Conference.

ACPE #:0126-9999-13-459-L01-P

Learning Objectives:
- Explain the benefits of a pharmacist’s participation as a first-responding member of the rapid response team.
- Describe the types of medication therapy interventions that may be provided by pharmacists during medical emergencies.


450 - COST-BENEFIT ANALYSIS COMPARING RIVAROXABAN AND WARFARIN IN POST ORTHOPEDIC SURGERY

B4. General Clinical Practice

Presented by:
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Presenting on Wednesday, May 15 at 10:30 AM in Royal III

Background: rivaroxaban is a new oral anticoagulant approved for the prevention of venous thromboembolism (VTE) post orthopedic surgery. Updated guidelines from the American College of Chest Physicians recommend using extended prophylaxis up to 35 days because of significant reduction in VTE rates, regardless of the pharmacologic agent used. While cost-effective analyses comparing low molecular weight heparins to rivaroxaban in post orthopedic surgery have been conducted, comparisons of warfarin to rivaroxaban are lacking.

Objective: to evaluate whether a 30 day course of rivaroxaban or warfarin will be more cost-beneficial for the patient and institution in the prevention of postsurgical VTE after undergoing total knee replacement (TKR), total hip replacement (THR), or hip fracture surgery (HFS).

Methods: this is a prospective, randomized, open-label study approved by the Institutional Review Board. Patients who are not deemed eligible for enoxaparin by the physician will be randomized to receive rivaroxaban 10 mg orally once daily or warfarin dose-adjusted to an INR of 2.0-2.5. Rivaroxaban and warfarin will be initiated at 1700 the day after surgery. Duration of prophylaxis will be 30 days for patients post TKR, THR, or HFS on either medication. Patients will be followed for an additional 30 days after the last dose of the prophylaxis medication. Primary outcome is total cost to the patient and institution. Patient costs will include: outpatient prescription cost, laboratory charges, anticoagulation services for warfarin management, and admission for VTE. Institutional costs will include: inpatient medication charge, laboratory charges, and time for pharmacist monitoring and adjustment of warfarin. Secondary outcomes include: in-hospital costs by itself, rates of clinically significant VTE, major and minor bleeding rates, and blood loss as routinely measured by Hemovac drain post procedure.

Results/Conclusion: pending

ACPE #:0126-9999-13-460-L01-P

Learning Objectives:
Assess the advantages and disadvantages of using rivaroxaban as compared to warfarin for prevention of venous thromboembolism. Describe the differences in clinical impact of rivaroxaban and warfarin in terms of cost to the patient and institution.

451 - IMPROVING PHARMACY ANTI-COAGULATION IN A HEALTH CLINIC ON THE TULALIP TRIBAL RESERVATION: PRE-POST HOSPITALIZATIONS

B1. Ambulatory Care

Presented by:

Jonathan Phung, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Royal I

Purpose: Native Americans are at higher risk for health disparities and hospitalization rates than the rest of the US population. Among these health disparities, the American Heart Association reports that cardiovascular disease ranks the highest, specifically, pulmonary embolisms, deep vein thromboses, and myocardial infarctions. Because of this, a subset of this population requires anticoagulation to decrease the risk of developing clots. Secondly, when compared to the general population, hospitalization rates in Native Americans have been reported as high as 72% in men and 52% in women. Pharmacist-managed anticoagulation programs are well-established in hospital settings and have received a high degree of provider satisfaction. Currently, because there is a lack of documented evidence in ambulatory care settings focused on underserved populations, the Improving Pharmacy Anticoagulation in a Health Clinic on the Tulalip Tribal Reservation (IMPACT) study plans to address the need for pharmacists in an anticoagulation clinic to observe changes in hospitalizations.

Methods: To evaluate IMPACT, we designed an unblinded, non-randomized, prospective and retrospective study (n = 20). Evaluation will take place with patients and their respective primary care providers (PCPs). Patients currently being seen in the pharmacist-managed anticoagulation management program will be invited to participate on a prospective enrollment process. Data for this project will be collected primarily through retrospective chart reviews. The initial chart review will include medical records 24 months (2 years) prior to starting the pharmacist-managed anticoagulation care. After the initial chart review, a series of rolling chart reviews will be carried out on a quarterly basis until the study period ends on June 30, 2013. In addition, participating PCPs and patients will be asked quarterly to complete an anonymous 5-question survey about their level of satisfaction with the pharmacist provided care. Our inclusion criteria for PCP-participants are: age >18 years; member of Native American tribes; and currently receiving anticoagulation care through the Tulalip Health Clinic pharmacist. Exclusion criteria are: non-tribal members; age < 18 years; and inability to provide informed consent. Usual care practices differ markedly between PCP-managed and pharmacist-managed anticoagulation therapy. This evaluative study examines the impact of these changes primarily on INR stability and secondarily on all-cause hospitalizations during anti-coagulation therapy, as well as patient and provider satisfaction with the new program. By selecting patients previously PCP –managed, who are now pharmacist-managed, pre- and post- pharmacist care data can be directly compared for individuals. It will focus on the International Normalized Ratio (INR). Secondarily, it will explore potential causes of hospitalizations during anti-coagulation therapy and hospitalizations pre-post anti-coagulation care.
Analysis and Results: iMPACT’s safety and efficacy will be evaluated by comparing our pre- and post- program measures. The initial chart review period length was selected to provide several months of data for those participants previously managed by their primary care providers. Analysis will involve comparing data collected from the initial chart review and when the participant was managed by his/her PCP with data collected after he/she was referred for pharmacist care.

ACPE #:0126-9999-13-461-L01-P
Learning Objectives:
- Describe the effect of pharmacist intervention on anticoagulation-related hospitalizations.
- Describe patient anticoagulation management pre/post hospital discharge.


452 - EVALUATING HIV/AIDS, HAART AND IN-HOME HIV TEST KNOWLEDGE: A SURVEY OF NEW MEXICO PHARMACISTS
A1. Infectious Disease - Anti-infective Agents

Presented by:
Larry Pineda, PharmD
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Presenting on Wednesday, May 15 at 2:00 PM in Garden

Introduction:
There has been a push from the Centers for Disease Control and Prevention (CDC) and the US Preventative Task Force to diagnose human immunodeficiency virus (HIV) infection earlier. Approximately 30% of HIV infected persons in the state of New Mexico are unaware of their HIV-positive status, which is higher than the national average. The recent Food and Drug Administration (FDA) approval of an in-home HIV test may help improve screening. It will also provide a great opportunity for pharmacists to actively engage in improving public health. The objective of our study is to assess basic HIV/acquired immune deficiency syndrome (AIDS) and HIV in-home test knowledge of pharmacists in New Mexico.

Methodology:
Prior to commencement, this study was approved by the Institutional Review Board. We conducted a cross-sectional survey of New Mexico pharmacists attending the New Mexico Pharmacists Association 2013 Mid-Winter Meeting. Attendees were asked to complete a three-part questionnaire as part of an educational program. Our total expected enrollment number was set at three hundred. The questionnaire contained demographic and perception items, HIV/AIDS and highly active antiretroviral therapy (HAART) knowledge items, and in-home HIV test items. Survey data was captured using audience response technology. Demographic data will be reported using descriptive statistics. Perceptions data will be measured using a 5-point Likert scale. Knowledge data will be reported as a correct response percentage. Data analysis will be completed using SPSS software. By collaborating with the New Mexico Aids Education and Training Center, we will use the results of this study to develop educational programs aimed at improving HIV screening rates and improving public health in the state of New Mexico.

Results and Conclusion:
Will be presented.
453 - IMPACT OF A DIAGNOSTIC ALGORITHM FOR PNEUMONIA IN A VETERANS AFFAIRS LONG-TERM CARE FACILITY

B5. Long-Term, Geriatric or Hospice Care

Presented by:

Samuel Pitak, PharmD
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Presenting on Tuesday, May 14 at 2:00 PM in Sunset IV

Introduction
In long-term care facilities (LTCFs), antimicrobials account for approximately 40% of all systemic drugs prescribed, and there is a 50-70% chance that a resident will receive at least one course of antimicrobials in a 1-year period. However, studies have found that up to 75% of systemic antimicrobials are inappropriately prescribed.

Among elderly residents of LTCFs, the incidence of pneumonia is approximately ten times greater than the rate among those living in the community. Patterns of antimicrobial use for suspected cases of pneumonia within the Veterans Affairs Palo Alto Health Care System (VAPAHCS) LTCFs were previously examined. Out of 34 total episodes of pneumonia treated with antimicrobials, only 38.2% of cases had at least 2 of 3 “cardinal signs” of infection (leukocytosis, cough, fever) documented. Furthermore, chest radiographs were ordered in 50% of the episodes of pneumonia with only 60% of these radiographs consistent with infection. Sputum culture was obtained in 12% of episodes, of which only 25% were consistent with infection.

Based on these results, the current project aims to develop and to implement a diagnostic algorithm for pneumonia with the goal of improving the judicious use of antimicrobials. The primary outcome measure is to describe the proportion of cases of antimicrobial-treated pneumonia for which the diagnosis was consistent with the diagnostic algorithm. Secondary outcomes will be 1) proportion of cases in which appropriate signs/symptoms of respiratory tract infections are documented, 2) sputum gram stain and/or culture are obtained, 3) chest radiograph are obtained, and 4) the proportion of sputum samples and chest radiographs consistent with infection.

Methodology
This will be a retrospective chart review following provider education and implementation of the diagnostic algorithm for pneumonia. Provider education session will consist of information regarding the diagnostic algorithm, evidence behind the recommendations, and importance of judicious antimicrobial usage. Charts for patients residing in VAPAHCS LTCFs will be reviewed via the electronic medical record at 1 month, 2 months, and 3 months following the education session. Patients will be included if they are 18 years of age or older, are a resident of the VAPAHCS LTCF at Menlo Park, and have at least one course of antimicrobials prescribed for suspected or confirmed pneumonia while the patient is a resident of the LTCF during the 3 month follow-up period. Patients will be excluded if: hospice or comfort care, antimicrobials started before admission to LTCF, or antimicrobials started before the provider education session. Each episode of pneumonia treated with
antimicrobials will be analyzed as unique and independent. Data to be collected include: patient demographics, signs and symptoms of pneumonia, sputum Gram stain and culture and sensitivities if available, chest radiograph and interpretation if available, antimicrobial(s) initiated and duration, and influenza and pneumococcus immunization status.

Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-463-L01-P
Learning Objectives:
Describe the use of antimicrobials in LTCFs and the importance of antimicrobial stewardship efforts.
Describe the effectiveness of provider education and implementation of a diagnostic algorithm for pneumonia on patterns of diagnostic workup in a long-term care facility.


454 - EVALUATION OF NEW VASOPRESSOR RECOMMENDATIONS FOR SEPTIC SHOCK IN CRITICALLY ILL PATIENTS
B3. Critical Care

Presented by:
Elisabeth Plunkett, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Executive 713

Background
Huntington Memorial Hospital is a 625 bed non-profit, community teaching hospital located in Pasadena, California which contains 30 intensive care unit beds.

Septic shock is a life-threatening condition that claims nearly 210,000 lives each year in the United States. With the incidence and number of sepsis related deaths increasing, recent guidelines have advocated for the importance of early goal directed therapy with aggressive fluid resuscitation and the initiation of vasopressor therapy if refractory hypotension is present. While various studies have attempted to identify a superior vasopressor in the setting of septic shock, there has been no quality primary evidence to suggest the optimal agent(s).

The Surviving Sepsis Campaign has released the updated 2012 guidelines which will be published in the February 2013 issues of Critical Care Medicine and Intensive Care Medicine. While norepinephrine remains the first line vasopressor, there have been some changes regarding the selection of other vasopressive agents. First, dopamine is now only recommended in patients with low risk of arrhythmias and/or low heart rate. Additionally, phenylephrine should not be used unless (a) norepinephrine is associated with serious arrhythmias, (b) cardiac output is known to be high and blood pressure persistently low, or (c) as salvage therapy when combined inotrope/vasopressor drugs and low dose vasopressin have failed to achieve MAP goal. Finally, low dose vasopressin has been suggested as adjunctive therapy with norepinephrine with the intent of raising MAP to goal or decreasing norepinephrine dosage. After the Society of Critical Care Medicine meeting in February of 2012, the critical care physicians at our institution began to employ new vasopressor recommendations in anticipation of the new guidelines. As a result, we have seen that vasopressin is being used more frequently and earlier in septic shock patients. The primary objective of this study is to compare the 28 day mortality since the increased use of vasopressin for hemodynamic support in septic shock.
Methods

Data will be obtained by retrospective electronic records and/or chart review for the 2011 and 2012 months of October. Eligible patients will include those who are at least 18 years of age, fulfill at least 2 SIRS criteria with suspected or proven infection at ICU admission, and have received at least one vasopressor. Patients under 18 years old and pregnant females will be excluded from analysis. Subjects in the cohort prior to new guideline implementation will be matched by SAPS II score to subjects in the post implementation cohort. Secondary outcomes will examine length of stay (LOS) in the ICU, time to reach goal systolic blood pressure (as defined by Huntington Hospital’s protocol), duration and amount of vasopressor use, acute kidney injury, and time to hospital discharge. Results and conclusions will be presented.

ACPE #:0126-9999-13-464-L01-P

Learning Objectives:

List the vasopressor recommendation changes seen in the 2012 Surviving Sepsis Campaign Guidelines.
Describe the considerations for vasopressor selection in septic shock.


455 - EVALUATION OF ANTICOAGULATION WITH THERAPEUTIC ENOXAPARIN IN HEMODIALYSIS

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Tiffany Pon, PharmD
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Presenting on Wednesday, May 15 at 9:30 AM in Royal V

Background: There exists a paucity of data regarding the efficacy and safety of using therapeutic low molecular weight heparins (LMWH) for anticoagulation in patients with severe renal insufficiency requiring hemodialysis (HD). As LMWH are primarily renally cleared, the risk of using these agents in HD patients is understandably bleeding. Objective: The purpose of this retrospective medical record review is to evaluate the safety and efficacy of therapeutic anticoagulation with enoxaparin in patients requiring HD. Hypothesis: Enoxaparin < 1mg/kg daily is a safe and effective anticoagulation dose in HD patients. Methods: The Electronic Medical Record was searched from 2004 to present for HD patients anticoagulated with therapeutic enoxaparin. The HD enoxaparin group was compared to a matched cohort of HD patients treated with therapeutic unfractionated heparin (UFH). The following patients met inclusion criteria: age > 18 years, HD, at least one order for enoxaparin < 1mg/kg/day or therapeutic UFH. Patients with incomplete medical records were excluded. Demographic data and pertinent past medical history were collected in addition to laboratory values and vital signs. The primary endpoint measures were 30-day rate of thromboembolic event and/or dialysis catheter clotting and 30-day rate of major bleeding using International Society of Thrombosis and Haemostasis (ISTH) criteria. Secondary endpoints included 30-day re-hospitalization, mortality, and rate of ISTH minor bleeding. Results and conclusions will be presented.

ACPE #:0126-9999-13-465-L01-P

Learning Objectives:
List patient risk factors for bleeding
Describe an approach to using therapeutic enoxaparin in hemodialysis


456 - MEDICARE PART B INJECTABLE DRUG UTILIZATION IN A MEDICARE ADVANTAGE PART D PLAN: UTILIZATION MANAGEMENT OPPORTUNITIES
E1. Managed Care

Presented by:

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Presenting on Wednesday, May 15 at 5:00 PM in Sunset II

Introduction: Medicare Part B drug spending totaled $11.5 billion in 2010 following a series of payment system reforms in previous years, and spending is predicted to continue to increase. However, utilization trends of drugs covered under Medicare Part B are not widely studied or published, and best practices for utilization management of Part B drugs do not exist. Drugs covered under Medicare Part B are usually injectable products provided to patients incident to a physician's service, usually administered in a medical office. Many of these injectable drugs are expensive, priced at hundreds to thousands of dollars per injection. The Part B drugs with the highest costs include immune modulators (e.g., rituximab and infliximab), erythropoiesis-stimulating agents, and chemotherapy (e.g., pemetrexed and docetaxel). Within managed care organizations, clinical pharmacists can play a role in improving appropriate utilization and decreasing drug costs by implementing utilization management strategies with teams of providers.

The objective of this study is to (Part 1 – Utilization Analysis) quantify and describe the utilization and prescribing habits of high-cost injectable drugs that are covered under the Medicare Part B benefit for beneficiaries in a Medicare Advantage Part D health plan from 2007 to 2012; and (Part 2 – Semi-Structured Interviews) explore the roles that pharmacists can have in employing utilization management strategies for Part B drugs from the perspective of health care providers and medical specialists.

Methodology: This is a retrospective utilization review of drug, prescriber, and patient data from medical claims using HCPCS codes for Part B drugs and from pharmacy claims using NDCs from 2007 through 2012. The study population was all obtainable claims within one Medicare Advantage Part D plan that serviced about 70,000 patients in 2012. Analysis included descriptive statistics and logistic multivariate analysis. Data from the review were then shared with a group of health care providers in 30 minute in-person or telephonic semi-structured interviews. Observations from the interviews were collected and summarized. The interviews investigated the possible roles for pharmacists in utilization management, aimed at improving appropriate, cost-effective prescribing.

Results: Within the Medicare Advantage Part D plan, the top one percent of prescribing physicians accounted for over one-third of non-capitated medical drug claims costs to the health plan. In addition, the ten most costly drugs of the health plan accounted for more than half of the non-capitated medical drug claims costs. From semi-structured interviews of leadership and physicians within the health plan, there was agreement that pharmacists should provide clinical guidelines for use of Part B drugs, along with guidance and training for providers for appropriate billing of injectables in the office, negotiation of rebates and contracts with pharmaceutical manufacturers to reduce overall health plan costs, and other pharmacist-driven utilization management.
Conclusion: The results from this study will identify high-cost targets for future utilization and cost management strategy implementation at a Medicare Advantage Part D health plan. Results will also provide guidance for designing prescribing behavior interventions within managed care organizations.

ACPE #:0126-9999-13-466-L01-P

Learning Objectives:
- Describe the utilization and cost trends of high cost Part B drugs for a Medicare Advantage Part D plan.
- Explain potential roles for pharmacists in utilization management of medical benefit drugs within an HMO setting.


457 - TOBRAMYCIN IN OLDER ADULT PATIENTS WITH CYSTIC FIBROSIS—A POPULATION PHARMACOKINETIC STUDY

B7. Pharmacokinetics

Presented by:

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Presenting on Tuesday, May 14 at 11:00 AM in Sunset III

BACKGROUND
Cystic fibrosis (CF) is a genetic disease caused by a defect in the CF transmembrane regulator gene, leading to reduced airway surface liquid and impaired mucociliary clearance. Acute pulmonary exacerbations with Pseudomonas aeruginosa (PA) are a frequent complication that results in loss of lung function. While intravenous (i.v.) tobramycin is a mainstay in the treatment of PA infections in CF patients, appropriate guidelines are needed to optimally dose and monitor aminoglycosides for older, adult CF patients who may have declining renal function. Many studies have attempted to build a full population pharmacokinetics (PK) model for tobramycin but have yet to account for an aging CF population. Many factors such as age, renal function and weight, need to be considered when it comes to tobramycin dosing. Thus, by evaluating the influence of different covariates on the population PK model for tobramycin, further insight will be provided on the necessary targets to maximize PK-pharmacodynamics (PD) relationships in this patient group.

METHODS
A retrospective chart review was performed for CF patients admitted to Keck Medical Center of USC from October 1, 2010 to October 31, 2012. Eligible patients included those who were 18 years of age or older, received i.v. tobramycin for treatment of an acute pulmonary exacerbation, and who had measured peak and trough serum tobramycin concentrations. Records were accessed using Cerner and through the Electronic Patient Folder (EPF) database.

PRELIMINARY RESULTS AND CONCLUSION
Our population PK model included 34 males and 42 females who were all well-nourished and exhibited good renal function. The final population model showed good fit to the data. However, a better fit was seen with the one-compartment model. The correlation of the PK model was good (R-squared = 0.853) between the observed and the predicted population, as well as between the predicted and the observed individuals (R-squared = 0.929). The mean elimination rate constant (KE0) was 0.0024 min/h*mL and 22.3% CV, while the mean volume of distribution (V0) was 0.358 L/kg and 37.3% CV. From the Monte Carlo simulations, a difference in proportion
was observed between peaks of 25 and 35; this was 18.3%, 30.6%, 41.4%, and 49.8% at 7, 8, 9, and 10 mg/kg, respectively. Furthermore, the mean peak at each respective dose was 20.3, 23.2, 26.1 and 29.0 mg/L. The proportion between AUC0-24 of 85 and 100 also showed a difference and was relatively constant due to the assumption of linearity at about 47% (range 42-54%) of the population. The mean AUC0-24 at 7, 8, 9, and 10 mg/kg, respectively, was 75.2, 85.9, 96.7, and 107.5 mg*h/L. Thus, based on peak and AUC0-24 targets, the optimal dose for older, adult CF patients is 8 mg/kg.

ACPE #:0126-9999-13-467-L01-P

Learning Objectives:

- Identify the main pathogen associated with acute pulmonary exacerbations in cystic fibrosis patients.
- Determine an appropriate tobramycin dose for adult cystic fibrosis patients.


458 - IMPACT OF ITRACONAZOLE AS AN ANTIFUNGAL PROPHYLAXIS AGENT ON CARDIAC ALLOGRAFT REJECTION IN HEART TRANSPLANT RECIPIENTS

B4. General Clinical Practice

Presented by:

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Presenting on Tuesday, May 14 at 3:30 PM in Royal III

Introduction

Invasive aspergillosis (IA) has been characterized as the most common invasive mycosis in heart transplant recipients leading to 53% to 78% mortality in infected patients. Therefore, numerous heart transplant centers have initiated prophylaxis therapy with itraconazole (ITA) when patients are most susceptible during the first few months post-transplant. ITA, a strong CYP3A4 and P-glycoprotein (P-gp) inhibitor, may lead to significant drug interactions with calcineurin inhibitors (CNIs) and result in higher plasma concentrations. Potential fluctuations in CNI drug levels, especially after discontinuation of ITA, may lead to increased risk for allograft rejection. The Organ Procurement and Transplantation Network reported graft survival in heart transplant recipients at one year to be 88.6% in 2010 based on national data. However, acute rejection still remains a challenge within the heart transplant population. Approximately 24% of patients from 2005 to 2009 experienced their first episode of rejection during their first year of transplant, placing them at a higher risk for organ failure. Multiple studies have evaluated the interaction between ITA and CNIs and have reported 1.5 to 6.6-fold increases in CNI concentrations upon initiation of ITA. Antifungal prophylaxis with ITA in heart transplant recipients was instituted at Stanford Hospital and Clinics (SHC) in 2009. The purpose of our retrospective study was to determine whether or not the use of prophylaxis ITA is associated with an increased risk of acute rejection in heart transplant recipients. The primary objective of this study is to determine the risk of cardiac allograft rejection, if any, resulting from per protocol discontinuation of ITA three months post-transplant. The secondary outcomes are incidence of fungal infections, hospitalization due to rejection, length of stay, and incidence of medication-related adverse effects.

Methodology

This study is a retrospective review of heart transplant recipients at SHC comparing those who received ITA prophylaxis for three months post-transplant (post-ITA) to a group that did not receive ITA (pre-ITA). The study
evaluated 250 heart transplant recipients from 2004 to 2012 making up the pre-ITA and post-ITA periods. The study assessed incidence and severity of rejection between month-three to month-nine post-transplant in all patients, which correlates with discontinuation of ITA prophylaxis. Type and grade of allograft rejection has been identified based on patients’ diagnostic endomyocardial biopsies. Patient baseline characteristics, immunosuppression regimens, donor and recipient cytomegalovirus serum statuses, CNI trough doses and levels, incidence of fungal infections, and markers of adverse effects including liver function tests, nephrotoxicity, hyperlipidemia, and hemoglobin A1C have been carefully assessed.

Results: will be presented
Conclusions: will be presented

ACPE #:0126-9999-13-468-L01-P
Learning Objectives:

Describe if prophylaxis with itraconazole in heart transplant recipients can be associated with acute allograft rejection post-therapy discontinuation.

Explain the impact of itraconazole prophylaxis on incidence of fungal infections in heart transplant recipients.


459 - CHANGES IN TENOFOVIR POPULATION PHARMACOKINETICS DURING PREGNANCY
B7. Pharmacokinetics

Presented by:
Matthew Powell, PharmD
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Presenting on Tuesday, May 14 at 11:30 AM in Sunset III

Introduction:
Tenofovir (TFV), a once daily nucleotide reverse transcriptase inhibitor, is a common component of Combination Antiretroviral Therapy (CART) used in HIV-infected pregnant women. The pharmacokinetics (PK) of tenofovir may be affected by the physiologic changes occurring during pregnancy, such as altered gastrointestinal function and increased glomerular filtration and body water. Previous studies found a 25-33% reduction in TFV exposure during pregnancy. The objective of this study was to perform a population PK analysis of TFV during pregnancy and postpartum to determine the mechanism(s) underlying reduced TFV exposure during pregnancy.

Methodology:
IMPAACT P1026s is an ongoing, prospective, non-blinded study of antiretroviral (ARV) PK in HIV-1-infected pregnant women receiving ARVs for routine clinical care [ClinicalTrials.gov Identifier: NCT00042289]. This analysis included data from P1026s cohorts receiving 300 mg TFV disoproxil fumarate (135.6 mg TFV) daily, either as Viread® or co-formulated with emtricitabine (Truvada®) or emtricitabine/efavirenz (Atripla®). Steady-state TFV PK profiles were collected at 30-36 weeks gestation (3rd Trim) and 2-12 weeks postpartum (PP), and optionally during the second trimester between 20-26 weeks gestation (2nd Trim). PK samples were taken pre-dose and 1, 2, 4, 6, 8, 12, and 24 hours post-dose. Plasma TFV concentrations were determined by a LC-MS-MS method. Population PK analyses were performed using NONMEM version 6.2 (FOCEI subroutine). The potential impact of pregnancy stage, serum creatinine, concomitant ARVs (ritonavir boosted protease inhibitors
(PI)), albumin, and age were assessed as potential covariates in the model during a univariate screen which was followed by a multivariate assessment. Individual subject’s PK parameters were estimated using an empiric Bayesian approach.

Results:
Eighty-six steady-state PK profiles were collected encompassing 650 plasma TFV concentrations from 46 women during the 2nd trimester (n=7), the 3rd trimester (n=41), and 2-12 weeks postpartum (n=38). 54 women (63%) were receiving ritonavir boosted PI. The TFV concentration data were best described using a two-compartment model with first-order absorption and elimination. Allometric scaling of PK parameters resulted in a better fit than unscaled PK parameters and was included in the analysis prior to other covariates. Absorption was rapid and essentially complete prior to the first PK sample at 1 hour so KA was fixed at 7 hr⁻¹ (t1/2 absorption = 10 min) to promote model stability. Inter-occasion variability was included for F for each subject visit. Age, pregnancy state, serum creatinine, and albumin were significantly associated with CL/F during the univariate screen but only serum creatinine (SCr) remained a significant covariate when added to subject size in the final model. The final model parameters and intersubject variabilities (%CV) were:

- CL/F (L/hr/kg⁻⁰.⁷⁵) = 2.03 L hr⁻¹ * (SCr / 0.6 mg dL⁻¹)⁻⁰.⁵¹⁷ (24%)
- V²/F (L/kg) = 6.84 (35%)
- V³/F (L/kg) = 8.22 (43%)
- Q/F (L/hr/kg⁻⁰.⁷⁵) = 4.84

The post-hoc AUC estimates were significantly lower during the 3rd Trim versus PP (geo. mean 2.38 vs 2.90 mcg*h/mL, p = 0.009) with a 3rd Trim:PP ratio of 0.83 (0.75-0.91 90% CI).

Conclusion:
Changes in TFV pharmacokinetics during pregnancy are related to weight gain and to reduction in SCr associated with enhanced glomerular filtration.

ACPE #:0126-9999-13-469-L02-P
Learning Objectives:
- List three common physiological changes during pregnancy that can affect pharmacokinetics.
- List two physiological parameters associated with changes in TFV pharmacokinetics during pregnancy as identified in this study.


460 - SHARED MEDICAL APPOINTMENTS FOR CHRONIC PAIN: IMPROVING QUALITY OF CARE AND PATIENT SATISFACTION IN A PATIENT CENTERED MEDICAL HOME
B1. Ambulatory Care

Presented by:
Shannon Puckett, PharmD
University of Washington Community and Ambulatory Care
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Presenting on Wednesday, May 15 at 8:30 AM in Royal I

Introduction: The Patient Centered Medical Home (PCMH) model strives to improve access, outcomes, and patient satisfaction with their medical care. The PCMH model utilizes an interdisciplinary team approach for more effective and efficient healthcare for chronic disease state management. Washington state law has mandated chronic pain providers to offer updated informed consent for patients on chronic narcotic.
medications as well as yearly assessments of pain management and a signed treatment agreement. In an effort to meet Washington state law requirements, improve informed consent and increase patient satisfaction with chronic pain management, providers at Providence Medical Group Monroe approached pharmacy residents to develop a shared medical appointment (SMA) for chronic pain. Education and informed consent are the focus of the visit and can be more efficiently delivered in a group setting, while still allowing the physician to address the individual needs of each patient. It is anticipated that the multi-disciplinary team approach with pharmacist provision of informed consent education for narcotic medications will improve patient understanding of narcotic medications and satisfaction with their chronic pain management. Patients will have the option to request follow-up by a pharmacist for evaluation of depression medications, smoking cessation, medication side effects management, and a comprehensive medication review. Patient and provider satisfaction with the shared appointment will also be measured.

Methodology: The study is a prospective, quasi-experimental study. The SMA is a new service at Providence Medical Group in Monroe. The providers began utilizing shared medical appointments for chronic pain as part of their standard of care starting in October 2012. Data collection began with IRB approval in December. Providers recruit patients who have been taking chronic narcotic medications >3 months to attend mandated yearly SMA for chronic pain during an individual appointment. Inclusion of patient information in this research study by IRB informed consent is completely voluntary while attendance to SMA is not. Patients are provided a thirty minute presentation by the pharmacy residents on narcotic medications including mechanism of action, side effects, risk for dependence, addiction, withdrawal, overdose, and how to properly store, handle, and dispose of medication. Patients have access to pharmacist at all times and may request follow up for depression medication, medication side effect management, comprehensive medication reviews, and smoking cessation. Patients complete and sign an updated informed consent agreement and chronic opioid treatment agreement. Patients are given a randomized patient satisfaction survey at the end of the visit. The patient satisfaction surveys will be assessed using a 5-point Likert scale. Number of requests for pharmacist follow-up will also be measured.

Results/Conclusion: Preliminary results will be presented.

ACPE #:0126-9999-13-470-L01-P

Learning Objectives:
- Explain the effectiveness of shared medical appointments at improving patient satisfaction with chronic pain management
- Describe the role of the pharmacist as part of the interdisciplinary team in the management of chronic pain patients within the shared medical appointment


461 - PHYSICIANS' PERCEPTIONS ON MEDICATION THERAPY MANAGEMENT AND COMMUNICATED INTERVENTIONS
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Shrouq Qaisi, PharmD
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Presenting on Wednesday, May 15 at 10:30 AM in Sunset IV
Introduction:
The Medication Management Center was established in 2006 at the University Of Arizona College Of Pharmacy to provide medication therapy management (MTM). The purpose of the pharmacist staffed call center is to improve the health of the populations it serves by maximizing health outcomes through individualized patient education, enhanced self-management, and medication therapy management through telephonic consultations. The center provides clinical services primarily to Medicare part D patients with chronic disease states including but not limited to the following: asthma, COPD, HTN, DM, CHF, and hyperlipidemia. If an intervention opportunity is found, a fax stating the intervention opportunity is generated and sent to the prescriber(s) involved.

One of the barriers identified to providing MTM services includes physician recognition/perception. A meta-analysis published in the Journal of Pharmacy Practice which reviewed survey articles on MTM services reported that 60-78% of physicians had favorable attitudes toward having collaborative practice agreements with a pharmacist. However, physicians believed they would be better MTM providers due to their clinical training. A second study in JAPhA reported communication gaps with a pharmacist providing MTM services offsite, because the interventions reported by pharmacists did not seem complete. A portion of the respondents in this study expressed interest in seeing a video of what a pharmacist MTM session would look like in order to fill in their knowledge gaps about the sessions.

Although there are few studies that examine physicians’ perceptions on MTM services provided by a pharmacist there are none that examine communication style or format preferences.

Purpose:
The purpose of this study is to examine physicians’ perceptions of MTM and whether they change after an overview presentation of the services provided. Physicians’ preferences of intervention content, format, and method of interventions will be gathered, discussed and examined.

Methodology:
Physicians will be recruited at El-Rio and UAHN clinics through dissemination of recruitment material which will also be faxed to any Tucson, AZ or Phoenix, AZ physician who has received an MMC patient drug intervention or recommendation in the past year. The goal is to recruit 10-20 physicians for one or two focus group sessions. The recruited physicians will complete a pre and post survey on their perception of MTM services provided by MMC. During the actual session a quick overview of the services provided at the MMC will be presented prior to the post survey. Then different communication methods of relaying an intervention and the various style and content of interventions will be examined and discussed. Physicians will be asked to give their preferences and the reasons as to why. The focus group sessions will be transcribed for later review.

Conclusion:
Data collection and evaluation are ongoing

ACPE #:0126-9999-13-471-L01-P
Learning Objectives:
  Explain what medication therapy management is and what it entails?
  List the physician-preferred method of communication and the amount of content/details in an intervention.


462 - EFFICACY OF VANCOMYCIN LOADING DOSES IN PATIENTS WITH METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA)
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 2:30 PM in Garden

Background: Methicillin-resistant Staphylococcus aureus (MRSA) is among the leading causes of antibiotic-resistant infection in the United States. The incidence of this pathogen has increased steadily since the 1960s, with MRSA now representing nearly 60% of the S. aureus isolated from hospitalized patients. Vancomycin has long been the gold standard for treatment of serious MRSA infections. However, though the drug has been available for more than 50 years, controversy still exists as to the proper method of dosing. The 2011 Infectious Disease Society of America (IDSA) guidelines for the treatment of MRSA infections state that a 25-30 mg/kg loading dose of vancomycin may be considered in the case of severe infections. However, while the use of a loading dose appears safe and likely results in more rapid attainment of therapeutic trough levels, data is still lacking as to whether this approach affects the drug’s nephrotoxic potential or results in improved clinical outcomes.

Purpose: Vancomycin dosing and monitoring guidelines developed by the Intermountain Healthcare Antimicrobial Stewardship Team state that loading doses are optional and may be used in patients with severe infections. However, at McKay-Dee Hospital, patients with severe MRSA infections do not receive loading doses of vancomycin. Instead, these patients are dosed at 20 mg/kg, with this dose continued until the first trough level. At Intermountain Medical Center, loading doses of 25-30 mg/kg are optional for patients with severe infections, with patients receiving subsequent doses of 15-20 mg/kg. This difference in practice patterns provides an opportunity for the evaluation of differences in outcomes between patients who received loading doses and those who did not. We hypothesize that there is no difference in clinical outcomes between the two approaches. Additionally, as larger vancomycin doses have been associated with nephrotoxicity, we hypothesize that patients who receive loading doses will experience more nephrotoxicity than those who do not.

Methods: Approval of the Institutional Review Board was obtained prior to commencement of the study. Using Intermountain’s computerized medical records database, all patients who received vancomycin for documented MRSA bacteremia, pneumonia, endocarditis, meningitis or osteomyelitis between 6/1/2009 and 5/31/2012 were identified. Patients who received less than 72 hours of vancomycin, and those less than 18 years of age, on hemodialysis, pregnant or breastfeeding, or with documented polymicrobial infections were excluded. The study’s primary endpoint was days to resolution of morbidity, as defined by return of abnormal vital signs to normal baseline values, resolution of leukocytosis, and other condition-specific markers. Clinical response was recorded daily beginning twenty-four hours after the administration of the first dose of vancomycin. Secondary endpoints included (1) vancomycin level at the time of first trough, (2) time to therapeutic trough, (3) time to clearance of blood cultures, (4) length of stay, and (5) incidence of nephrotoxicity.

Data collected included patient age, sex, height, weight, comorbid conditions, APACHE II scores, cultures and sensitivities, vancomycin trough levels and dose(s) received, concurrent nephrotoxic medications, and daily WBC count, serum creatinine, temperature and vital signs. All data was de-identified to protect patient confidentiality.

Results: To be presented.

ACPE #:0126-9999-13-472-L01-P
Learning Objectives:
- Describe the evidence supporting the use of loading doses of vancomycin in critically ill patients with methicillin-resistant Staphylococcus aureus.
- List potential complications associated with the use of loading doses of vancomycin.

463 - AN EVALUATION OF EFFICACY, SAFETY, AND COST OF DARBEPOETIN ALFA DOSING WITH A TARGETED HEMOGLOBIN RANGE OF 9-10 G/DL

B1. Ambulatory Care

Presented by:

Lisa Quon, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Royal I

Currently there is no consensus on a specific target hemoglobin range for treating chronic kidney disease (CKD) patients with anemia. Based on the 2011 FDA statement regarding the safety of Erythropoiesis-Stimulating Agents (ESA) in CKD patients with anemia, San Francisco General Hospital (SFGH) modified their Renal Clinic protocol to maintain patients’ hemoglobin within the range of 9-10 g/dl instead of 10.5-12g/dl, which was previously used. The objective of the study is to evaluate the efficacy, safety, and cost of darbepoetin alfa dosing with a targeted hemoglobin range of 9-10 g/dl in subjects with anemia secondary to CKD at SFGH. This retrospective chart review study consists of subjects diagnosed with anemia secondary to CKD who have established care at SFGH Ward 92 Renal Clinic and whose darbepoetin alfa therapy is managed by clinical pharmacists. This study is designed to evaluate the efficacy, safety, and cost of using darbepoetin alfa with a hemoglobin target of 9-10 g/dl (current protocol) compared to 10.5-12 g/dl (previous protocol). Patient data during the provision of standard care from December 2010 to December 2012 will be reviewed. The primary outcome measures of this study are efficacy and safety of darbepoetin alfa under a pharmacist managed protocol. Efficacy of darbepoetin alfa will be measured by comparing the number of red blood cell transfusions received over the course of treatment between the two treatment arms. The protocols’ effectiveness in maintaining patients within their respective target Hgb ranges will be assessed. Safety outcomes will include occurrence of the following adverse events: hypertension, myocardial infarction, heart failure, stroke, and deaths Cost of darbepoetin alfa will be included as a secondary outcome. This study will promote evidence-based management of anemia in patients with CKD. This study has the potential to further establish safe and effective hemoglobin target levels with darbepoetin alfa therapy. Efficacy, safety and cost effectiveness outcomes remain under investigation, with data collection and evaluation currently being conducted.

ACPE #:0126-9999-13-473-L05-P
Learning Objectives:

Describe an update to pharmacist protocols for managing darbepoetin therapy in patients with anemia secondary to chronic kidney disease at San Francisco General Hospital Ward 92 Renal Clinic.

Describe a difference in efficacy or safety outcomes between treatment arms with an Hgb target of 10.5-12 mg/dl and 9-10 mg/dl.


464 - EFFICACY AND SAFETY OF N-ACETYLCYSTEINE IN OBESE PATIENTS WITH ACETAMINOPHEN TOXICITY

B3. Critical Care
Presented by:

John Radosevich, PharmD
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Presenting on Wednesday, May 15 at 8:30 AM in Executive 713

Background: Approximately one third of the United States population is obese and there are a growing number of obese patients who are encountered in the clinical setting. Currently, the FDA approved labeling for N-acetylcysteine (NAC) does not have information regarding dosing NAC in patients who weigh more than 100kg and there is limited information regarding the dosing of this agent in the obese. In clinical practice, it is possible that some patients who are obese do not receive optimal dosing leading to poor outcomes. The purpose of this project is to determine the efficacy and safety of intravenous NAC in obese versus non-obese adults for the management of acetaminophen toxicity.

Methods: This is a retrospective cohort study of patients who were given NAC for acetaminophen toxicity. Patients will be categorized into two groups based on body mass index: 1) obese versus 2) non-obese. Consecutive adults who received intravenous NAC for presumed acetaminophen toxicity over a 7-year time period at The University of Arizona Medical Center were evaluated. Patients were excluded if they received NAC for an indication other than presumed acetaminophen toxicity. The proportion of patients who developed hepatotoxicity or who developed an adverse drug effect will be compared between the two groups using a Chi-squared test. Logistic regression analysis will be performed to adjust for covariates and for potential baseline differences between the two groups. A two-tailed alpha of 0.05 will be used for all analyses.

Results: To be presented at the Western States Conference in May 2013.

Conclusions: To be presented at the Western States Conference in May 2013.

ACPE #:0126-9999-13-474-L01-P

Learning Objectives:

- Describe the efficacy of N-acetylcysteine (NAC) in obese versus non-obese patients with acetaminophen toxicity.
- Describe the safety of N-acetylcysteine (NAC) administration in obese versus non-obese patients with acetaminophen toxicity.


465 - IDENTIFYING FOLLOW UP MEASURES TAKEN BY PARTICIPANTS AFTER OBTAINING ABNORMAL SCREENING VALUES AT HEALTH FAIRS

B2. Community Practice

Presented by:

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Presenting on Tuesday, May 14 at 4:30 PM in Sunset V
Introduction:
In the U.S., the prevalence of chronic illnesses, such as diabetes, cardiovascular disease, and osteoporosis, continues to increase. According to the CDC, 15% of Americans have one or more of these chronic conditions undiagnosed. Millions of these people will end up in the healthcare system late in disease progression where costs are higher and outcomes suboptimal. Also, people with chronic disease are often uninvolved in self-management of their care and unaware of how well their chronic illness is controlled. Many of these individuals lack the motivation or the means to seek the care that is necessary. Community health fairs are a means to identify risk factors, detect asymptomatic undiagnosed chronic diseases and test those with chronic diseases. Health fairs offer an assortment of free disease screenings to populations with, sometimes, limited access to healthcare services or resources to pay for them. Research has shown the value of health fairs in identifying risk, however, there is limited data regarding the acceptance of post-screening recommendations provided to health fair participants and their commitment to follow-up with primary care providers after obtaining abnormal results. This study will assess the follow-up measures taken by health fair participants after obtaining abnormal screening results for diabetes, hypertension, dyslipidemia and osteoporosis.

Methodology:
Abnormal screening data linked to a unique identifier (UI) will be extracted from the USC Community Biometrics Database (CBD) for a 5-month period beginning in October 2012 through February 2013. Hard copies of health fair consent forms, containing contact information, were pulled by UI according to the CBD data extract. Participants 18 years or older with a national guideline accepted abnormal screening value were contacted by phone at least 1 month after the health fair to determine if recommended medical follow-up occurred or was scheduled. Survey data will include demographics, medical follow-up actions taken or willingness to follow-up. Exclusion criteria include those that could not be contacted or refuse to answer the survey. Post-health fair follow-up survey data will be paired with the biometric data using the UI. Data will be analyzed using descriptive and inferential statistics.

Results and Conclusions: to be presented

ACPE #:0126-9999-13-475-L01-P

Learning Objectives:
- List the prevalence of abnormal screening and testing values from health fairs.
- Describe recommended participant follow-up and self-reported actions taken for abnormal values.


466 - ANALYSIS OF RIBAVIRIN DOSE REDUCTION ON HEPATITIS C PATIENTS RECEIVING DIRECT ACTING ANTIVIRALS
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
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Presenting on Wednesday, May 15 at 11:00 AM in Sunset IV

Purpose
This project evaluates ribavin dose reduction in patients receiving direct acting antiviral (DAA) therapy for hepatitis C genotype 1 treatment. Adding DAA’s to the classic regimen of ribavinir and pegylated interferon,
dramatically increases sustained viral response (SVR) rates in patients with hepatitis C, but also significantly increases treatment-related side effects. Specifically, anemia rates and use of erythropoiesis stimulating agent (ESA) increase. Recent studies show a decrease in ribavirin dose can lead to lower rates of anemia, and does not appear to affect SVR rates.

Methods
Researchers will retrospectively analyze patients receiving treatment with either bocepravir or telaprevir in combination with ribavirin and pegylated interferon for the treatment of hepatitis C genotype 1 at the Veterans Affairs Northern California Health Care System. Patient exclusion criteria: 1) using therapy any way other than as directed by their provider; 2) stopping ribavirin during treatment; or 3) with hepatitis C other than genotype 1. Patient comparison will consist of two ribavirin dose groups: greater than 600mg per day, and less than or equal to 600mg per day for a majority of treatment days. HCV RNA levels at the end of treatment will be the primary efficacy endpoint. Anemia rates, assessed by comparing average hemoglobin levels between groups, will be the primary safety endpoint. The amount of ESA used and HCV RNA levels at different futility check points during treatment will be the secondary endpoints. Pharmacoeconomic analysis will determine the impact of reduced dose ribavirin in patients receiving DAA’s. Researchers will present results and conclusions.

ACPE #:0126-9999-13-476-L01-P
Learning Objectives:
Describe the effects of a reduced daily dose of ribavirin on triple therapy for the treatment of Hepatitis C. Identify the potential pharmacoeconomic impact of a reduced daily ribavirin dose in triple therapy for the treatment of Hepatitis C.


467 - IMPLEMENTATION AND EVALUATION OF AN ANTICOAGULATION REVERSAL PROTOCOL AT A TERTIARY MEDICAL CENTER
B3. Critical Care

Presented by:
Marie Rapier, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Executive 713

Introduction: There has been a recent influx of agents used for the treatment of thromboembolic disease. These agents have been touted as simpler, and perhaps safer, alternatives. However, there are no known reversal agents for these new therapies and as their use has increased, there has been a need to define a reversal strategy for patients who present with life-threatening bleeding events. Providence Sacred Heart Medical Center is a Level II trauma facility with 644 licensed beds serving as a referral hospital for the inland northwest. At our institution, the only oral anticoagulant with a defined reversal protocol is warfarin in the setting of intracranial hemorrhage (ICH); reversal strategies for dabigatran and rivaroxaban have yet to be defined. Furthermore, an analysis of the ICH protocol found that doses of reversal agents were not consistent with new recommendations, leading some patients to require repeat doses. The objective of this project is to implement and evaluate an anticoagulation protocol at a tertiary medical center.

Methods: System-wide anticoagulation recommendations were developed based on current literature. These recommendations were reviewed and adapted for our institution with the neurology and intensive care service
lines and the pharmacy and therapeutics (P&T) committee. The site-specific guidelines were used to update the current ICH standard orders as well as create new reversal recommendations for novel oral anticoagulants. Pharmacist and physician education was prepared and distributed. A simplified anticoagulation reversal order set is being developed that will describe appropriate reversal of oral antiplatelet agents as well as warfarin, dabigatran and rivaroxaban.

Results: Post-implementation clinical outcomes (INR reversal, progression of ICH, blood product use) will be compared to pre-implementation data. Protocol adherence will also be assessed and presented.

Conclusions: To be presented.

ACPE #:0126-9999-13-477-L01-P

Learning Objectives:
- Describe an appropriate reversal regimen for warfarin, dabigatran and rivaroxaban.
- List the steps involved in the protocol implementation process.


468 - THERAPEUTIC DRUG MONITORING IN PEDIATRIC VORICONAZOLE DOSING

B6. Pediatric or Gender Specific Care

Presented by:

Melissa Rees, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Sunset II

Introduction:
Voriconazole is an azole antifungal agent that is used at Seattle Children’s for the treatment of invasive aspergillosis or serious Scedosporium asperspermum or Fusarium spp infections in patients refractory or intolerant to other therapy.(4) Given that these are serious infections, in patients who are often critically ill, and that voriconazole may not be the first line antifungal therapy ordered for the patient, it is imperative that patients achieve therapeutic drug levels as quickly as possible. This study is designed to examine retrospective data to determine if we are achieving therapeutic levels as expeditiously as we can.

The current pediatric voriconazole dosing recommendations are based upon pharmacokinetic studies conducted in adult patients.(7,9) Recent research has shown that the pharmacokinetics of voriconazole in children may be significantly different than in adults.(5,8,10) It appears that children clear voriconazole more rapidly than adults, therefore children require significantly higher dosing to achieve therapeutic serum drug levels.(10,11,12) With our current dosing approach, the initial dose may not be adequate. We obtain periodic serum drug levels, and gradually titrate the dose until targeted therapeutic levels are attained. This study aims to determine what doses have been historically adequate in children in our institution, as well as the length of time taken to achieve therapeutic serum levels. Furthermore, research suggests that there may be pharmacokinetic differences between children 5 years old or less and older children, and has supported the belief that serum drug monitoring is necessary to optimize therapeutic regimens.(2,6,7) We have examined the retrospective data to determine if any adjustments in our dosing approach should be made to introduce a revised dosing approach for patients less than 5 years old to account for differences in pharmacokinetic clearance activity..

Methods:
We have collected retrospective data on patients who have received the drug voriconazole over 13 months at Seattle Children’s Hospital. We have used this data to examine optimal dosing levels needed to achieve therapeutic serum drug levels, as well as time taken to achieve these optimum levels. We have also validated that voriconazole clearance changes with patient age as suggested by prior research. It appears that the age of 5 acts as a cutoff for when this change occurs. Our preliminary data suggests that the current regimen does not achieve therapeutic levels as quickly as possible for children 5 years old and younger. By changing our dosing approach for patients 5 years old and younger, we believe we can achieve better outcomes for patients by reaching therapeutic drug levels faster.

Results and Conclusion:
Specific recommendations for a revised dosing/monitoring approach will be presented.

References:

ACPE #:0126-9999-13-478-L01-P
Learning Objectives:
1. Explain the current practices in pediatric voriconazole dosing
2. Describe new dosing recommendations for pediatric voriconazole dosing

Appropriate Empiric Antibiotic Therapy for Ventilator Associated Pneumonia in Trauma Intensive Care Unit Patients

A1. Infectious Disease - Anti-infective Agents

Presented by:

Stephen Rettig, PharmD
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Presenting on Wednesday, May 15 at 3:00 PM in Garden

Purpose: Empiric antibiotic therapy for ventilator associated pneumonia (VAP) is usually based on time of disease onset and risk for multi-drug resistant pathogens. A study from a single, multidisciplinary intensive care unit (ICU) reported that both early-onset and late-onset VAP were mainly caused by multi-drug resistant bacteria; most commonly Pseudomonas aeruginosa and methicillin-resistant Staphylococcus aureus. Appropriate empiric antibiotic selection depends on clinical evaluation of patient factors and antibiograms of individual ICUs. This study aims to determine appropriate empiric antibiotic therapy for suspected VAP in trauma ICU patients, retrospectively assess its effect on clinical outcomes, and evaluate whether implemented regimen results in less costly medication therapy.

Methods: The institutional review board has approved this retrospective chart review. Mechanically ventilated patients on the trauma ICU service treated for suspected VAP with microbiologic culture and antibiotic sensitivity data from October 2011 through August 2012 were retrospectively reviewed to determine the most appropriate empiric antibiotic therapy for VAP based on time of VAP onset and antibiotic sensitivity data. This data was presented to the trauma ICU physicians in January 2013 and the implementation of the determined empiric antibiotic regimen was approved. A second cohort of trauma ICU patients will be retrospectively reviewed from January 2013 through April 2013, to determine if appropriate initial antimicrobial therapy had an effect on VAP recurrence rate, number of days on mechanical ventilation, duration of ICU and hospital stay, and all cause mortality. Costs will be calculated based on amount of antibiotic medication required for treatment and the associated therapeutic drug monitoring costs, if applicable. Patients who are less than 18 years old, incarcerated, pregnant, or have insufficient microbiologic data to determine appropriate therapy will be excluded.

Results: 434 patients were screened for the first cohort, with 136 patients meeting inclusion criteria. Organism occurrence was stratified based on time of VAP onset. Early-onset VAPs (days 1-4) were more likely to be caused by community-acquired and sensitive pathogens (MSSA 22%, H. influenzae 16%, Mixed Upper Respiratory Flora (MURF) 30%, S. pneumoniae 6%), while late-onset VAPs (days 5 or more) were more likely to be hospital-acquired organisms (P. aeruginosa 10%, MRSA 10%, Enterobacter spp. 5%, Citrobacter spp. 5%, A. baumannii 3%). The combination of cefepime plus vancomycin was the most common regimen selected by physicians for empiric therapy (65%) and provided appropriate coverage 94% of the time for early- and late-onset VAPs. Based on antibiotic sensitivity data, it was determined that ceftriaxone or levofloxacin alone would have been appropriate empiric therapy for early-onset VAP in 85% of patients, while cefepime plus vancomycin would have been appropriate empiric therapy for late-onset VAP in 88% of patients.

Conclusion: Based on data from quantitative BAL cultures and associated antibiotic sensitivity data, ceftriaxone has been approved as empiric antibiotic therapy for early-onset VAP (days 1-4) and the combination of cefepime plus vancomycin has been approved as empiric antibiotic therapy for late-onset VAP (days 5 or more) in patients on the trauma ICU service. Data collection for the second cohort is currently in progress.
List key findings based on time of VAP onset including: antibiotic usage, organism occurrence, clinical outcomes, and medication utilization costs.
Describe potential advantages of more targeted empiric antibiotic selection for treatment of ventilator associated pneumonia.


470 - EVALUATION OF ENDOGENOUS TOXIN CLEARANCE AS A SURROGATE FOR VANCOMYCIN DOSING IN CRITICALLY ILL PATIENTS ON CRRT.

Presented by:

Paul Reynolds, PharmD
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Presenting on Tuesday, May 14 at 10:30 AM in Sunset III

Introduction/Purpose:
The relationship between traditional assessments of the efficacy of renal replacement therapy and drug removal via RRT remains largely unknown. As many small molecules (such as urea, creatinine, phosphorus, β2 microglobulin) may have similar sieving coefficients and clearance compared to drugs with a similar molecular weight and protein binding, the rate of their clearance may serve as a surrogate for drug clearance. The primary objective of this study is to determine a pharmacokinetic model that accurately predicts drug clearance based upon the clearance of renally removed wastes (such as creatinine, blood urea nitrogen, phosphorus and β2 microglobulin) in patients receiving RRT.

Methodology:
This prospective pharmacokinetic study is enrolling patients based on three inclusion criteria: admission to a critical care unit at the University of Colorado Hospital (UCH), oliguria (< 500 ml/day urine output), and receipt of vancomycin therapy while undergoing continuous RRT. After obtaining patient (or their Proxy) consent, three serum and effluent steady state sampling points (approximating peak, midpoint, and trough concentrations) were collected with plans to analyze concentrations of creatinine, phosphorus, urea, β2 microglobulin, and vancomycin, respectively. Analysis of samples was either conducted by the UCH clinical laboratory or by liquid chromatography with tandem mass spectroscopy. Sieving coefficients, concentrations, and total clearance of each substance will be analyzed to determine their correlation with vancomycin clearance. Area under the curve (AUC 0-12 and 0-24) and total systemic clearance of vancomycin will also be determined to validate the model. Enrolled patients receiving other antimicrobials in addition to vancomycin will have a pharmacokinetic analysis of those antimicrobials determined to assess the validity of the model for drugs other than vancomycin.

Results: To be presented.

ACPE #:0126-9999-13-480-L01-P

Learning Objectives:

List the common variables that may affect extracorporeal drug clearance during renal replacement therapy.
Illustrate the benefits and limitations of using endogenous substances as a surrogate for drug clearance in renal replacement therapy.
Documenting pharmacist interventions is critical to improving patient safety and quality and demonstrating pharmacist impact on the cost of care. An effective intervention program is needed to facilitate the documentation of pharmacy interventions in a timely and efficient manner. City of Hope is a NCI-designated comprehensive cancer center with 65 pharmacists servicing the inpatient, outpatient and ambulatory care areas. Currently, pharmacists record interventions into a homegrown Microsoft Access® desktop database system. Pharmacist intervention reporting has declined over the last few years at City of Hope. The purpose of this study is to evaluate the feasibility of using Microsoft SharePoint® to capture pharmacy interventions.

An initial survey was conducted to collect baseline data regarding barriers to pharmacist documentation of interventions. Several barriers were identified including reduced prioritization of intervention documentation, lack of accessibility to the Access® database, excess data fields to input, and inadequate pharmacist training on using the program. Baseline survey responses were analyzed and then utilized with the goal of developing a new intervention program that was more accessible, streamlined the intervention program data fields, and minimized documentation time. After considering the advantages and disadvantages of both commercial and homegrown options, the decision was made to develop a new intervention program using a Microsoft SharePoint® site that is accessed through the City of Hope intranet web page. From December 2012 to January 2013, a pilot study was conducted with a group of 13 pharmacists who documented pharmacy interventions using the new SharePoint® intervention program. At the end of the pilot study, a second survey was conducted to assess improvement in access and use of the pharmacy intervention program. After analysis of the pilot group survey, the pharmacy intervention program was modified to address barriers that continued to persist after implementation of the new program. Pharmacy intervention data will be collected and evaluated pre and post implementation to determine the impact on reporting trends as a result of improved education, accessibility, and usability of the new intervention program. Results and conclusion will be presented at the upcoming meeting.

ACPE #:0126-9999-13-481-L05-P

Learning Objectives:
- Describe the selection, development, and implementation of a pharmacy intervention program using Microsoft SharePoint®.
- List elements that improve access and increase use of a pharmacy intervention program.
Introduction: VTE, which is comprised of deep vein thrombosis (DVT) and pulmonary embolism (PE), is an important cause of preventable death in hospitalized patients. The incidence of VTE is significant as hospitalized patients often present with various risk factors for VTE. Current evidence suggests that the best approach for preventing VTE is for every patient to be assessed for primary prophylaxis upon admission to the hospital since preventing DVT is essential in reducing morbidity and mortality associated with an ensuing PE. Despite the frequency with which VTE occurs in hospitalized patients, and the well-established efficacy and safety of preventative measures, prophylaxis is often underused or used inappropriately. Greater efforts are necessary to improve awareness of VTE and improve standards of VTE prevention in healthcare organizations to prevent untoward outcomes. Beginning January 2013, the Centers for Medicare & Medicaid Services (CMS) and The Joint Commission (TJC) began measuring VTE performance as part of the accreditation process and public reporting. This single-center observational study is designed to measure in the rate of VTE prophylaxis and to report outcomes of patients who received VTE prophylaxis in non-ICU and ICU patients at a community medical center.

Methodology: Collaborative strategies were investigated and implemented in a multidisciplinary team approach. As members of the VTE team, clinical pharmacists and a pharmacy resident attended team meetings and participated in the VTE prophylaxis initiative. The pharmacist-led VTE team developed and implemented performance improvement strategies to include provider education, revision of a VTE prophylaxis order set, VTE risk assessment, “measure-vention”, and required VTE assessment within the computer physician order entry (CPOE). “Measure-vention” is the process of measuring adherence to evidence-based practices, using a systematic checklist and intervening to mitigate potential harm to the patient in real time. This study excludes patients age younger than 18 years, patients with a length of stay less than two days, comfort care patients, patients with diagnosis of mental disorders, stroke, obstetrics, VTE, and patients included in the Surgical Care Improvement Project core measure. Baseline data collected from January 2012 through March 2012 showed a VTE prophylaxis rate of 79%. Post-intervention data will be collected retrospectively from September 2012 through April 2013. The primary endpoint is the rate of VTE prophylaxis. Additional endpoints include the rate of compliance of VTE prophylaxis to national guidelines, and the number of hospital-acquired VTE events.

Results: Pending
Conclusion: Pending

ACPE #:0126-9999-13-482-L01-P
Learning Objectives:
- Describe VTE prophylaxis as a performance measure standard in a hospital setting.
- Describe impact of various strategies and role of the pharmacist in VTE prophylaxis in a hospital setting.

Background: Recently, the Department of Health and Human Services established what are known as meaningful use criteria to provide monetary incentives for hospitals that have implemented electronic health records to demonstrate that they are competent users of the technology. Several of these measures focus on VTE prophylaxis. One such measure assesses the number of patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was administered upon admission. In order to receive monetary compensation, hospitals need to be able to provide documentation showing that the use of electronic health records allow for the tracking of such data. Moreover, hospitals are encouraged to use such data to help improve the care provided to their patients.

Objective: The purpose of this study is to evaluate the rates of appropriate venous thromboembolism prophylaxis, according to meaningful use criteria, using computerized physician order entry technology at a large, multicenter, community hospital.

Methods: A computerized physician order entry (CPOE) system was implemented at Scottsdale Healthcare in the Fall of 2012 that requires providers to choose appropriate VTE prophylaxis or document justification of nonuse for each patient before further medical action can be taken. The health system’s electronic medical record system was used to identify patients who were admitted to the hospital between November 2012 and February 2013. Patients admitted to the labor and delivery department and who are less than 18 years of age were excluded from the study. The following data was collected: patient age, gender, ethnicity, admitting hospital unit, form of thromboembolism prophylaxis or documented reason of nonuse, presence of thromboembolism post admission as confirmed by imaging studies, physiological location of confirmed thromboembolism, and corresponding VTE clinical outcomes. All data was recorded without patient identifiers and maintained confidentially. Information gathered was compared to a previous study conducted at Scottsdale Healthcare in 2011 that examined the rates of venous thromboembolism before and after implementation of an optional VTE prophylaxis order set.

Results and Conclusions: To be presented at 2013 Western States Residency Conference.

ACPE #:0126-9999-13-483-L01-P

Learning Objectives:

- Describe the impact of computerized physician order entry on appropriate use of venous thromboembolism prophylaxis in a large community hospital.
- Explain potential shortcomings in mandatory computerized physician order entry decision support.

474 - EVALUATING THE IMPLEMENTATION OF A PHARMACIST-MANAGED RENAL DOSE ADJUSTMENT PROTOCOL
B4. General Clinical Practice

Presented by:

Beth Ridley, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Royal III

INTRODUCTION
Drugs eliminated primarily by the kidneys can potentially accumulate in patients with renal dysfunction which leads to inappropriately high doses or toxicity. To improve patient safety and establish a standardized practice, the initiation of a pharmacist-managed renal dose adjustment protocol is being developed at a community hospital. Prior to hospital-wide implementation, a four-month study to be conducted in the general medicine ward will evaluate the overall utilization of the protocol and assess the percentage of renally adjusted medications appropriately dosed in accordance to protocol calculations.

METHODOLOGY
The retrospective, unblinded, non-randomized, observational, institutional review board approved study will utilize the inclusion criteria of the protocol to identify patients with renal dysfunction who are receiving a medication which requires renal adjustment. Collected and de-identified information will include patient parameters used to calculate and evaluate renal function (age, gender, height, weight, blood urea nitrogen, and serum creatinine), the medication information which qualified for renal adjustment (name, dose, route, and frequency), the name of the renal estimation calculation used, and the timeliness of dosing adjustment (within 24 hours of the initially reported renal dysfunction). In addition, reasons for not adjusting medications in qualifying patients will be documented. The resulting data will thereby provide a validated tool for assessing the implementation and future assessments of a pharmacist-managed renal dose adjustment protocol in a community hospital setting.

RESULTS and CONCLUSION
The findings of this study will be presented.

ACPE #:0126-9999-13-484-L01-P
Learning Objectives:
- List the possible savings with implementing a renal dose adjustment protocol
- Describe the benefits of implementing a pharmacist-managed renal dose adjustment protocol


475 - RETROSPECTIVE ANALYSIS OF A PHARMACY-MANAGED ERYTHROPOIETIN CLINIC FOR CKD PATIENTS: OUTCOMES & ASSOCIATED COST-SAVINGS
B1. Ambulatory Care

Presented by:
Presenting on Wednesday, May 15 at 9:30 AM in Royal I

The black box warning for epoetin alpha states: “Erythropoiesis-stimulating agents (ESAs) increase the risks for death, myocardial infarction, stroke, and other serious cardiovascular events.” In June 2011, the FDA released a safety announcement recommending “more conservative dosing for ESAs in patients with chronic kidney disease (CKD) to improve the safe use of these drugs.” Due to the risk of severe adverse effects and the need for careful monitoring and tight control of laboratory parameters, pharmacy ambulatory clinics have been developed in Kaiser Permanente for the specific management of patients on these medications. Nephrologists at the Kaiser Permanente Redwood City Medical Center (RWC) have identified and, up until recently, managed patients with CKD who require ESAs such as epoetin alpha (Procrit®, Epogen®) to treat their resulting anemia. In the Spring and Summer of 2012, these physicians referred this set of patients to the already established pharmacist-managed Erythropoietin (EPO) Clinic at Kaiser Permanente South San Francisco (SSF) where pharmacists work under protocol to manage and monitor ESA therapy. In this pre-post study with patients serving as their own controls, a retrospective chart review was performed for these patients for six months before and six months after EPO Clinic enrollment. Patients were included if they were diagnosed with CKD, were referred to the SSF EPO clinic by a RWC nephrologist, had a minimum six month history of ESA use before clinic enrollment, and had a minimum six month duration of EPO clinic enrollment (n=21). The clinical impact of pharmacists’ management of ESA therapy will be measured by assessment of patient lab results, frequency of patient follow-up, and frequency and management of adverse events. A cost-effectiveness analysis of the clinic will also be performed. Study design, methods, and results will be presented.

ACPE #:0126-9999-13-485-L01-P

Learning Objectives:
- Describe the monitoring parameters used in managing a patient on an erythropoiesis-stimulating agent.
- Describe the potential benefits of a pharmacist-managed medication monitoring and management clinic.


476 - DEVELOPING A PHARMACY BENEFIT MANAGEMENT PROGRAM FOR UNIVERSITY OF UTAH HOSPITALS AND CLINICS

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Matthew Rim, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Sunset IV
Introduction
Pharmacy benefit managers (PBMs) adjudicate prescription claims and provide cost saving services for pharmacy. However, PBM’s value to the health care system is being questioned due to the methods in which profits are earned such as pharmaceutical company rebates and spread pricing. University of Utah Hospitals and Clinics (UUHC) consists of an extensive network of ambulatory care and outpatient pharmacy services. A commercial PBM provider manages prescription claims for 16,700 members of UUHC Employee Health Plan. Using a PBM service with transparency, integrity, flexibility, and cost savings is warranted to prepare for the future directions of the organization and provide quality services to our members. The purpose of this project is to evaluate the financial incentives and quality improvements of transitioning to a new pharmacy benefit management program.

Methodology
The study group obtained drug utilization data between July 1st, 2012 and October 31st, 2012 from UUHC Employee Health Plan. Also invoices from the current PBM were collected to determine total gross cost for the PBM services, which also provided information to compare the drug utilization and the PBM charge data. University of Utah Hospitals and Clinics Human Resources provided the rebate estimation from the current PBM. In order to compare drug cost differences with the PBM transition, the study group provided drug utilization data to a third party pharmacy benefit administrator (claim processor). The claim processor provided their drug cost estimations and administration fees based on our drug utilization data. The study group calculated the financial returns and total costs with the PBM transition to estimate the return on investment based on all financial data stated above. In addition, the study group visited one of hospital based PBMs to benchmark their PBM operations and cost saving and quality improvement projects.

Results and Conclusion
Results and conclusion will be discussed.

ACPE #:0126-9999-13-486-L04-P
Learning Objectives:
- Describe net financial gains with a new pharmacy benefit management program
- List potential opportunities to improve quality and financial performance by managing pharmacy benefits


477 - IMPACT OF FDA SAFETY COMMUNICATION FOR SIMVASTATIN/GEMFIBROZIL USE ON LIPID CONTROL AND PRESCRIBING TRENDS ON VETERANS
B4. General Clinical Practice

Presented by:
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Presenting on Wednesday, May 15 at 1:30 PM in Royal III

Background: On June 8, 2001 the US Food and Drug Administration (FDA) issued a Drug Safety Communication advising the public that the concomitant use of simvastatin and gemfibrozil was contraindicated due to the increased risk of adverse effects. The Phoenix VA Health Care System (PVAHCS) undertook a patient safety initiative to minimize the use of this combination.
Objective: The objective of this study is to compare fasting triglyceride levels in Veterans at the PVAHCS who were receiving concomitant simvastatin and gemfibrozil before and after the FDA Drug Safety Communication and to describe the effect of the Communication on lipid prescribing patterns.

Study Design: This is a retrospective, non-randomized, chart-based review.

Methods: Veterans receiving concomitant simvastatin and gemfibrozil for lipid control at the Phoenix Veterans Affairs Health Care System at the time of the June 8, 2011 FDA Drug Safety Communication will be screened for eligibility for this study. A list of Veterans receiving the combination will be extracted from pharmacy records. The primary objective is to compare fasting triglyceride levels in Veterans at baseline and at follow-up. The baseline lab value will be defined as the most recent lab values prior to changes made in a Veteran’s lipid-control regimen (up to 12 months before medication changes) in response to the Drug Safety Communication. Follow-up is defined as the first lab values drawn between 6 weeks and 12 months after the initial changes were made in the lipid-control regimen.

Secondary objectives will compare changes in HDL, LDL, and total cholesterol in Veterans taking simvastatin-gemfibrozil combination before and after changes to their lipid-control regimen. In addition, triglycerides will be compared before and up to 12 months after changes in lipid-control regimen in order to capture data from patients who may have had multiple lipid-control medication regimen changes. The changes made to Veterans’ lipid-control regimens will be recorded in order to describe changes in treatment patterns. Safety of lipid-control agents will be evaluated via Veteran reported adverse events and lab values such as liver function tests and creatine kinase (CPK).

Veterans prescribed concomitant simvastatin and gemfibrozil for at least 6 months prior to regimen change, with a fasting lipid panel available within 12 months before and after the change in their lipid-control treatment regimen will be included. Veterans will be excluded from this study if labs are unavailable, received lipid management outside the VA, or if there is inadequate information available in the chart for evaluation.

Results and Conclusion: Study findings will be presented.

ACPE #:0126-9999-13-487-L01-P

Learning Objectives:

Describe changes in fasting triglyceride levels in Veterans at the Phoenix VA Health Care System before and after the FDA Drug Safety Communication.

Describe changes in lipid control prescribing patterns as a result of the June 8, 2011 FDA Drug Safety Communication at the Phoenix VA Health Care System.


478 - ANTIBIOTIC ADMINISTRATION TIME IN SEPSIS AND CORRESPONDING SURVIVAL

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 3:30 PM in Garden

Sepsis and septic shock are serious medical conditions with a mortality rate of up to 50%. The two most recent Surviving Sepsis Campaign guidelines strongly recommend(ed) early medical intervention, including antibiotic
initiation within the first hour of diagnosis. Studies have shown that each hour delay of antibiotic administration results in a mortality increase of 8%. Our study will evaluate the survival of patients with sepsis and septic shock in relation to the duration of time between diagnosis and antibiotic initiation at the New Mexico VA Healthcare System. Our goal is to look at adherence to the Surviving Sepsis Campaign guidelines since their most recent update in 2008. Potential findings in this study will aid in the process of developing a sepsis treatment physician ordering bundle. In this chart review, we will identify patients diagnosed with sepsis or septic shock since 1/2008 [ICD-9 coding (severe) sepsis (995.91/92), septic shock (785.52)]. Patients ≥18 years of age at diagnosis with an identifiable diagnostic time (time of lactate draw or blood culture) will be included. Primary outcome is the rate of survival at discharge. Patients who expired due to other causes, received in-hospital palliation or withdrawal of care, or received antibiotics before sepsis diagnosis will be excluded. Diagnosis time (time zero) will be time of lactate level or blood culture draw, since those labs are among the diagnostic tools for sepsis/septic shock. We then will look at time of antibiotic initiation, and patients will be grouped according to time lapse (in hours) from diagnosis to antibiotic initiation. Our secondary outcome is the initiated antibiotic, reported as percent appropriate. A simple power analysis, based on a previous study, calculated 224 patients to be adequate for 80% power and α-level of 0.05 to detect differences in survival between the 1st and 4+ hours. Kaplan-Meier probability and logistic regression for odds of survival based on antibiotic timing will be conducted. The results of this quality improvement project will be presented at Western States Conference.

ACPE #:0126-9999-13-488-L01-P

Learning Objectives:
- Describe the relationship between delayed antibiotic initiation and mortality in patients with (severe) sepsis/septic shock
- Name an early goal-directed treatment option for (severe) sepsis/septic shock


479 - STANDARDIZATION OF EMPIRICAL THERAPY FOR SKIN AND SOFT-TISSUE INFECTIONS IN HOSPITALIZED PATIENTS

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 4:00 PM in Garden

INTRODUCTION
Skin and soft-tissue infections (SSTI) in the hospital setting are a common problem and may present challenges for health-care providers due to the diverse collection of microbes responsible for infections and the presence of complicating factors such as increasing antimicrobial resistance and comorbidities such as diabetes. Choosing appropriate empiric antibiotic therapy for skin and soft tissue infections can be difficult as it depends highly on the clinical assessment of each patient as well as understanding of the underlying disease state. The most recent 2012 diabetic foot infection guidelines from the Infectious Diseases Society of America (IDSA) found that proper identification and treatment of SSTI can lead to cure and decrease the risk for amputation and colonization with resistant organisms. The primary outcome of this study is to determine if introduction of an educational card containing appropriate choices for empiric antibiotic therapy will result in improved prescribing
practices for hospitalized patients presenting to our private, non-profit, teaching hospital with skin and soft tissue infections. The secondary outcomes of this study are to assess the impact of intervention on 30-day readmission rates and development of super-infections, such as Clostridium difficile.

METHODOLOGY
This study is a retrospective chart review that will look at 50 randomized patients in each study group to compare empiric antibiotic selection pre-and post-intervention. The pre-intervention study group will include patients discharged from our hospital from February through April 2012 with designated ICD-9 codes. The post-intervention group will look at patients discharged from February through April 2013 with the same ICD-9 codes. For the study, an educational card was created containing the definition of infection, severity classifications, risk factors indicating need for additional antimicrobial coverage, and recommended empiric antibiotic selections. The card was distributed to prescribing providers in our hospital and educational presentations were provided to ensure understanding of the therapeutic recommendations. Patient charts will be randomly selected and reviewed to assess appropriateness of empiric antibiotic therapy in these patients. This study was reviewed and approved by the Exempla Investigational Review Board.

RESULTS AND CONCLUSIONS
Will be presented

ACPE #:0126-9999-13-489-L01-P
Learning Objectives:
- List potential consequences of inappropriate antimicrobial therapy in patients being treated for skin and soft tissue infections.
- Describe the risk factors that influence empiric antimicrobial therapy for skin and soft tissue infections in the hospital setting.


480 - RETROSPECTIVE ANALYSIS OF A HIV-INFECTED VETERAN POPULATION AT A SINGLE VA FACILITY: ARE WE MEETING PRIMARY CARE GOALS?
B1. Ambulatory Care

Presented by:
Stephanie Roberts, PharmD
Veterans Affairs Palo Alto Health Care System
Stephanie.Roberts2@va.gov

Presenting on Wednesday, May 15 at 10:00 AM in Royal I

Introduction: Improvement in the prognosis of persons living with human immunodeficiency virus (HIV) infection has given rise to an aging HIV-positive patient population. Few studies have investigated primary care management of the aging HIV-positive population, and the limited published data to date have focused mainly on HIV-positive patients with diabetes. Satlin and colleagues found that 33% of HIV-positive patients with diabetes receiving care at a large, urban, university teaching hospital had inadequate glycemic control. Furthermore, only 42% and 66% of the HIV patients with diabetes met goals for blood pressure and low-density lipoprotein cholesterol, respectively. At present, no published study has evaluated primary care goal attainment in a HIV-positive veteran population.

Methodology: This will be an observational, retrospective medical chart review. Patients will be included in the analysis if: 18 years or older, veteran status, enrolled in the Veterans Affairs Palo Alto Health Care System
(VAPAHCS) HIV Clinical Case Registry, have documented HIV infection, had at least one clinic encounter with the VAPAHCS Immune (HIV) Clinic between 1/1/2011 and 12/31/11, and have documented International Classification of Diseases, Ninth Revision (ICD-9) diagnosis of diabetes in their problem list dated before 2011 or written documentation of diabetes in any provider note charted during 2010. In addition, patients must have HgbA1c laboratory results in at least two different 3-month quarters during 2011. Patients will be excluded if documented to have type I diabetes, gestational diabetes, pre-diabetes, or glucose intolerance. Data will be collected from the electronic medical record, including: patient demographics; duration of HIV infection; co-morbid conditions; medication, vitals, and laboratory profiles; vaccination status; tobacco use status; primary provider type; ophthalmic and microfilament exam; measurement of microalbumin/creatinine ratio; and hospitalizations and clinic appointments during 2011. The primary objective of this analysis is to determine rates of American Diabetes Association (ADA)-recommended goal attainment for glycemic, blood pressure, and lipid parameters. Rates of goal attainment will be based on the ADA 2011 standards of care recommendations. Secondary objectives will be 1) to identify risk factors associated with inadequate glycemic control, 2) to describe immunization rates, and 3) to describe rates of nephropathy, podiatric, and ophthalmologic screenings and exams. Descriptive and comparative statistics will be used to analyze the data.

ACPE #:0126-9999-13-490-L02-P
Learning Objectives:
   List the rate of ADA goal attainment among the VAPAHCS HIV-positive veteran population and compare this to HIV-positive patients evaluated in other studies
   List the characteristics of a HIV-positive veteran patient with type II diabetes and inadequate glycemic control


481 - PHARMACY AND MEDICAL CLAIMS-BASED ANALYSIS TARGETING INSULIN DURABLE MEDICAL EQUIPMENT FOR COST AND CARE INTERVENTION
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
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Group Health Cooperative
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Presenting on Wednesday, May 15 at 1:30 PM in Sunset IV

Introduction: According to the International Diabetes Federation, global expenditures for diabetes care in 2012 were estimated at $472 billion. At an average cost of care of $8,478 per person, the US accounted for over 43% of these total costs. Continuous subcutaneous insulin infusion pump (CSII) therapy is utilized in diabetic patients who have failed multiple daily injections (MDI) of insulin. Patients using CSII are the most expensive group of diabetic patients to treat, generally exceeding the US average expenditures. Insulin infusion pumps cost ~$5,000, with monthly supplies costing ~$200. Group Health provides care to members through two models; an internal delivery system (IDS) leveraging aggregated purchasing contracts and an external delivery system (EDS) operating as a contracted network. Insulin durable medical equipment (DME) may be processed as a medical or pharmacy claim within the Group Health system. Utilization is difficult to monitor through medical claims, and may contribute to excessive costs.
By utilizing a stepwise approach to identifying members based on health care utilization, the goal is to identify a novel approach to target and stratify low to high risk CSII members, create medical and pharmacy expenditure comparisons to support management of the DME program, and further identify opportunities to implement audit processes to promote accurate billing and decrease fraud, waste and abuse.

Methods: A retrospective review of medical and pharmacy claims was conducted comparing IDS and EDS insulin DME costs, and insulin DME trends. Medical and pharmacy claims were extracted for individuals enrolled in Medicare Advantage, HMO, and PPO insurance plans between January 1, 2006 and October 31, 2012. Members with at least one CSII pump pharmacy claim, or Healthcare Common Procedure Coding System (HCPCS) procedure code for CSII (E0784) were considered the base population. From the base population, all CSII durable medical equipment (DME) providers were identified. All external medical claims for the specified providers and CSII pharmacy supply claims were selected for the analysis period. Medical and pharmacy claims were manually reviewed and claims were included only for CSII pumps and supplies. Two analyses for cost and utilization were conducted comparing pharmacy versus medical claims for 1) CSII pumps and 2) CSII supplies. In the CSII pump analysis, cost models were created to simulate equal distribution of member cost shares (ranging from 0-50%), and utilization was examined for increased incidences of pharmacy and medical claim submittals. For the CSII supplies cost comparison, pharmacy claims were compared to the mode maximum claim allowable for each HCPCS code. Outlier costs were flagged for provider verification. A comparison of monthly supply cost was built for each manufacturer and compared medical and pharmacy claim costs. Based on cost, members will be further stratified by health care utilization and identified as candidates for care and/or cost interventions.

Results: Research-in-progress

ACPE #:0126-9999-13-491-L01-P

Learning Objectives:
- Explain the role of pharmacy and medical claim comparisons in targeted clinical interventions.
- Describe limitations and risks of medical claim insulin DME processing.


482 - APPROPRIATENESS OF EMPIRIC ANTIMICROBIAL THERAPY IN EARLY SEPSIS

A1. Infectious Disease - Anti-infective Agents

Presented by:

Lisa Rogers, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Garden

Appropriateness of empiric antimicrobial therapy in early sepsis

Purpose: Each year in the United States approximately 500,000 people present to emergency departments with suspected sepsis. Mortality rates for sepsis are estimated to be as high as 50%. To improve patient outcomes, the Surviving Sepsis Campaign guidelines recommend that appropriate antimicrobial therapy and fluid resuscitation be started within one hour of sepsis diagnosis. Initial treatment with inadequate spectrum antimicrobial therapy contributes to increased mortality in septic patients. As a result, initial empiric broad-spectrum therapy is common. At the University of Washington, a large academic medical center, patients presenting to the emergency department (ED) who are diagnosed with sepsis receive empiric antimicrobial therapy based upon the suspected primary source of infection according to institution specific guidelines. The
primary objective of this project is to quantify the percent of septic patients who receive appropriate spectrum antimicrobial therapy upon diagnosis of sepsis in the ED. The findings from this study will help further refine our empiric antimicrobial therapy guidelines for sepsis treatment in the ED and may allow us to tailor therapy towards specific patient populations.

Methods: A single center, retrospective chart review of 171 septic patients identified upon presentation to the ED at University of Washington Medical Center between March 2012 and December 2012. Variables collected include suspected source of infection, antimicrobial(s) chosen for initial treatment, microbiologic cultures and sensitivities, co-morbid conditions and past colonization.

Results: To be presented at Western States Conference 2013.

Conclusion: To be presented at Western States Conference 2013.

ACPE #:0126-9999-13-492-L01-P

Learning Objectives:
- Describe use of culture and sensitivity results to assess appropriateness of initial antimicrobial therapy in early sepsis.
- Explain how culture and sensitivity data is used to direct antimicrobial recommendations for treatment of early sepsis.


483 - DEVELOPMENT OF A PHARMACIST HEART FAILURE DISCHARGE CONSULTATION SERVICE

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

Ian Rojas, PharmD

University of California, Irvine Medical Center

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Presenting on Wednesday, May 15 at 10:00 AM in Royal V

Introduction: Patients with heart failure are regularly admitted into the hospital due to a number of complications, such as hypertension, ischemic heart disease, and hypoxia. These patients are usually discharged with complex regimens; many may have financial constraint and a limited understanding of their medications. This may result in early or frequent readmissions, which can be costly, avoidable, and can lead to less-than-ideal outcomes and reimbursement penalties from Medicare if readmission rates within a 30-day period exceed the allowable limit.

At the University of California, Irvine Medical Center (UCIMC), recent data suggest that close to 30% of readmissions within 30 days were medication-related. In response, the hospital started the Lean Six Sigma project, a multidisciplinary approach to reduce all-cause 30-day readmission rates for heart failure patients. To support the project, a pilot pharmacist heart failure discharge consultation program was formed. Readmitted patients, who are greater than 75 years old and have more than seven medications, or those who are between the ages of 18 and 75 and have more than 10 medications, will be referred for a thorough pharmacist consultation to improve understanding and adherence. Similar programs at other health care systems have been shown to be effective in reducing the incidence of or prolonging time to readmission.
The primary objective of this administrative project is to reduce medication-related 30-day heart failure readmissions at the UCIMC. The secondary objective is to investigate trends for readmission through chart reviews before and after initiation of the consultation program.

Methodology: One-page drug class summaries were developed to facilitate patient education with the goal to reduce 30-day readmission rates. Handouts were prepared based on drugs recommended in the current ACC/AHA guidelines for management of heart failure in adults. Each summary included the purpose of each drug in heart failure, brand and generic names, specific dosing instructions, if any, warnings and precautions, and common and severe adverse effects. Drug information was sourced from Micromedex. Then, using the handouts and teach-back methodology, a pharmacist performed a comprehensive consultation to qualified patients, explaining the importance of each medication and addressing barriers to adherence.

To investigate causes of early readmissions, charts of patients with the primary diagnosis of heart failure between January – March, 2011 (pre-intervention), were compared to those from January – March, 2013 (post-intervention). Charts were selected based on meeting criteria for discharge consultation referral, and patient demographics and time until 30-day all cause re-hospitalization were compared.

Results: Data collection is currently in progress.

Conclusion: To be discussed at the Western States Conference.

ACPE #:0126-9999-13-493-L01-P

Learning Objectives:
- Describe the benefits of pharmacist intervention, as part of a multidisciplinary approach to patient care, in reducing medication-related heart failure readmission rates.
- List possible factors and trends that can predispose heart failure patients to early readmission.


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**484 - IMPLEMENTATION OF A PROCALCITONIN ALGORITHM FOR GUIDING ANTIBIOTIC THERAPY IN PATIENTS WITH SUSPECTED SEPSIS**

B3. Critical Care

Presented by:

**Theresa Romaldini, PharmD**

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*Presenting on Wednesday, May 15 at 9:30 AM in Executive 713*

Introduction

Procalcitonin is a currently recognized tool used to direct antibiotic therapy in patients with various infectious disease states. Early detection and treatment is important in the overall prognosis of patients with suspected sepsis. The utility of procalcitonin for distinguishing between viral and bacterial sources of infection has been describe in the literature. The objective of this study is to implement a procalcitonin algorithm to be used when patients are admitted to an intensive care unit of a community hospital for suspected sepsis.

Methodology

During this observational study, procalcitonin levels are prospectively collected and utilized as part of a treatment algorithm in patients admitted to the ICU with suspected sepsis. The primary endpoint is total duration, in hours, of antimicrobial therapy. Secondary endpoints include changes to antimicrobial treatment associated with procalcitonin levels (escalation and de-escalation) and costs related to antibiotic use. Baseline
characteristics, including age, sex, source of infection (organism and location), antibiotic class or classes utilized for present admission, maximum sequential organ failure assessment (SOFA) scores and status at hospital discharge (survived or deceased), are being recorded. Control data were collected retrospectively, using patient data from ICU admissions one year prior to the initiation of this protocol.

Inclusion Criteria
- Admission by Memorial Hospital- UCH intensivists for suspected sepsis
- Admission to Memorial Hospital- UCH central location
- Initiation of antimicrobial therapy upon admission

Exclusion Criteria
- Age < 18 years
- Pregnant
- Prisoner
- Antimicrobial failure within prior 7 days
- Not admitted or consulted by Memorial Hospital- UCH intensivists
- Admission following
- Surgery
- Trauma
- Severe burns
- Present with Cardiogenic shock

Results
Data is currently being collected. Results will be available during presentation.

Conclusion
Data is currently being collected.

ACPE #:0126-9999-13-494-L01-P

Learning Objectives:
- Describe appropriate conditions for utilizing procalcitonin levels in patients with suspected sepsis.
- Explain when to recommend suitable changes to antimicrobial therapy based on procalcitonin levels.


**485 - IMPROVING PHARMACEUTICAL CARE OF THE CRITICALLY ILL OBESE PEDIATRIC PATIENT: A COLLABORATIVE QUALITY IMPROVEMENT PROJECT**

B6. Pediatric or Gender Specific Care

Presented by:

Emma Ross, PharmD
Children's Hospital Colorado
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Presenting on Wednesday, May 15 at 1:30 PM in Sunset II

Introduction: One in six children in the United States (US) is obese, making it one of the most important epidemics affecting children today. Despite being the leanest state for adults, Colorado is ranked 23rd in the nation for childhood obesity. In response to this epidemic, our institution formed a multidisciplinary Obesity Task Force to advance the technology and infrastructure surrounding the management of these children. While many advances have already been made, inconsistencies remain regarding identification and documentation of
obesity status as well as insight into appropriate medication dosing. Since weight-based dosing is often used in the pediatric population, knowledge of the appropriate dosing weight descriptor (actual, ideal or lean) is critical. Therefore, the purpose of this study is to develop a standard process for identifying and documenting obesity status in the electronic medical record (EMR), provide evidence-based dosing recommendations for commonly used medications in the pediatric intensive care unit (PICU) and evaluate the impact of a pharmacist-based obesity competency program.

Methodology: This is a multi-step quality improvement study. In concert with the Obesity Task Force, we will develop a Process Map to prioritize and visualize the work required at each step. Step one is to gain consensus on how to identify, calculate and document a dosing weight in obese children. Collaboration between members of this research group, the obesity task force and the EMR support group will be necessary. Step two will be the development of a utility score that describes the strength of the current literature as it pertains to dose recommendations in obese children. We will research the top 100 medications prescribed within PICUs in the US (using the Pediatric Health Information System (PHIS) database). Utility scores will be assigned to the primary literature collected from a systematic pubmed search (1971 through Oct. 2012). Step three will include a rigorous multidisciplinary review of the utility scores and a consensus of how to best dose each medication in the obese child. Step four will be to educate and disseminate the results from steps 1-3 to the clinical pharmacy staff by creating a computer-based competency program. We will compare pre- and post-competency program comfort and aptitude results. This study was approved by the Children's Hospital Colorado Organizational Research Risk and Quality Improvement Review Panel.

Results and Conclusions: The findings of this study will be presented after completion.

ACPE #:0126-9999-13-495-L01-P
Learning Objectives:
1. Describe process improvement strategies to increase the identification of obese children within a hospital setting and the impact of an obesity competency program.
2. Describe the strength of the primary literature as it pertains to medication dosing in obese children.


486 - IMPACT OF PHARMACISTS’ MANAGEMENT OF DIABETES IN CARDIOVASCULAR PHASE PATIENTS.
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:
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Presenting on Wednesday, May 15 at 4:00 PM in Mission Bay Foyer

Introduction: The role of the pharmacist in the management of chronic diseases continues to evolve and expand. Pharmacists are involved in many initiatives and programs aiming to improve outcomes through a variety of practice models. Growing evidence demonstrates the value of pharmacists in the management of diabetes; however, most of the published literature is centered on practice models in which pharmacists’ interventions need to be communicated and approved by physicians. Also, most models apply a case
management approach and have not yet investigated the impact of pharmacists in population risk management. The PHASE (Preventing Heart Attacks and Strokes Every Day) Clinic at Kaiser Permanente (KP) Fresno is a cardiovascular population risk management program aimed at the secondary prevention of cardiovascular events. The standard of care at KP Fresno is cardiovascular risk management by non-pharmacist PHASE providers, i.e. physician directed collaboration with nurses and other healthcare providers. A subset of patients receive management by PHASE pharmacists. PHASE pharmacists have prescriptive authority and can implement interventions directly per approved Pharmacy and Therapeutics (P&T) protocols. This study aims to investigate the impact of pharmacists’ diabetes management on the glycemic control of diabetic PHASE patients.

Methodology: Retrospective database analysis of diabetic PHASE patients managed by pharmacists in comparison to diabetic PHASE patients receiving standard of care. The study will include diabetic PHASE patients from the Fresno Service Area with a baseline A1C greater than 7% and having at least one PHASE encounter between 1/2011-12/2011. Patients managed by the Diabetes Clinic will be excluded as well as patients with initial A1C at goal. Patients in the pharmacist-managed group will be excluded if they had a PHASE intervention by another non-pharmacist provider during the study timeframe. Patients will be identified as candidates for the study from existing quality improvement data. Chart review will be conducted to collect patient demographics and endpoint data. The primary outcome is the change in A1C from baseline at time period 3-9 months after the PHASE encounter; secondary outcomes include percentage of patients achieving A1C goal at 3-9 months and the mean time to achieve A1C goal. A1C goal will be based on individual patient characteristics.

Results: To be presented.

Conclusion: To be presented.

ACPE #:0126-9999-13-496-L01-P

Learning Objectives:
- Describe the role of clinical pharmacists in the PHASE (Preventing Heart Attacks and Strokes Every Day) clinic.
- Explain the impact of clinical pharmacists in the management of diabetic patients in a population management setting.


**487 - PHARMACIST INTERVENTIONS IN PAIN MANAGEMENT**

A5. Neuro-Psych or Pain Management Agents

Presented by:

Ashley Rummel, PharmD
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*Presenting on Wednesday, May 15 at 9:30 AM in Palm III*

Introduction: Chronic pain affects over 100 million adults in the United States, and at least 25 million will experience acute pain annually from surgery or injury. In 2012, the Joint Commission published a sentinel event alert regarding the safe use of opioids in hospitals, emphasizing the risk of respiratory depression. Policies and procedures help to standardize the assessment and treatment of pain and to improve the quality of pain management in hospitalized patients. Still, many investigations of hospitalized populations have found that pain remains inadequately controlled, or that patients’ perception of pain management is suboptimal as reflected in patient satisfaction surveys.
Pharmacists can play an important role in pain management given their education in pharmacology and knowledge of analgesic and adjuvant therapies. Many hospitals have utilized pharmacists in a variety of ways to assist physicians by consultation or to independently make interventions. At St. Joseph's Medical Center, we currently offer pharmacist pain management by consultation. The purpose of this study is to assess pharmacist interventions to improve pain management and to evaluate current policies and procedures to ensure the safe use of opioids.

Methodology: Pharmacist interventions will include patient controlled analgesia (PCA) rounding and pharmacist pain consultations. Interventions will include patient education, dosing adjustments, transition to oral medications, and the use of adjunct medications to treat or prevent side effects. Outcomes assessed will be the types of interventions made, the rate of physician acceptance, and the impact of accepted interventions on patients' pain scores and incidence of side effects. Compliance with current policies and standard of care will also be evaluated.

Results and Conclusion: Results will be presented.

ACPE #:0126-9999-13-497-L01-P

Learning Objectives:

- List risk factors for respiratory depression with opioid therapy.
- Describe three interventions pharmacists can make in patients utilizing patient controlled analgesia (PCA).


### 488 - RETURN ON INVESTMENT OF A MEDICATION ADHERENCE AND REFILL REMINDER PROGRAM

B4. General Clinical Practice

Presented by:

**Arash Sadeghi, PharmD**
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Presenting on Wednesday, May 15 at 2:00 PM in Royal III

**INTRODUCTION:** Adherence to a prescribed medication has been associated with a reduction of total healthcare costs for a variety of chronic diseases, despite an increase in pharmacy costs. A refill reminder and medication adherence program targeting five chronic disease categories was developed and implemented. The program used pharmacy claims to identify patients who were non-adherent to their prescribed medications. Non-adherence was defined as failure to refill a medication in one of the pre-specified disease categories at least 7 days following the expected fill date and a proportion of days covered (PDC) of < 80% during the prior quarter.

Patients were identified biweekly and were eligible to receive an automated telephonic refill reminder in addition to a fax notification sent to their prescribing healthcare provider.

**OBJECTIVE:** An economic model with inputs from a retrospective pharmacy claims analysis and from a medical literature search will be used to estimate the total annual healthcare savings and financial return on investment (ROI) of the refill reminder and medication adherence program.

**METHODOLOGY:** Medication adherence will be measured before and after the intervention for program participants using an electronic pharmacy claims database. Patients will be included in the analysis if they have continuous enrollment with the plan during the study period (four months prior to the intervention date.
through four months after the intervention date). The change in medication adherence for the intervened population will be measured as the difference in the mean PDC between the pre- and post-intervention periods. In addition, the number of patients within literature-based adherence brackets (e.g., number of patients with a PDC < 80% or PDC > 80%) will be identified and compared for the pre- and post-intervention periods. The subsequent total annual healthcare savings will be estimated using changes in pharmacy costs and medical costs, and the costs of administering the program. The annual pharmacy costs incurred will be estimated using the measured PDC and the average ingredient cost per day for medications within each disease category. Using the medical literature, annual medical costs will be extrapolated based on the change in adherence, between the pre- and post-intervention periods.

RESULTS: The estimated total annual healthcare costs and ROI associated with the entire program will be presented and stratified by the individual disease categories targeted within the program. The number of patients identified and the number receiving one or more components of the program will be reported. The mean PDC for the pre- and post-intervention period and the number of patients within each medication adherence range will also be reported.

CONCLUSION: This economic model will quantify the financial impact of a medication adherence program consisting of a patient prescription refill reminder and a healthcare provider notification. Furthermore, it will measure the financial impact of the program for each individual disease category targeted.

ACPE #:0126-9999-13-498-L01-P
Learning Objectives:
- Describe the impact on patient adherence to common chronic disease medications of an automated telephonic refill reminder and a healthcare provider notification.
- Describe the financial impact of increased patient adherence to chronic disease medications to pharmacy, medical, and total healthcare costs.


489 - ANTIBIOTIC STEWARDSHIP INITIATIVE TO REDUCE ANTIBIOTIC DAYS OF THERAPY AND LENGTH OF STAY USING RESPIRATORY VIRAL PANEL
A1. Infectious Disease - Anti-infective Agents

Presented by:
Josie Saldana, PharmD
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Presenting on Wednesday, May 15 at 5:00 PM in Garden

Background: During the 2011-12 viral season, the laboratory at the study site began utilizing respiratory viral panel by real time PCR (RESPAN) testing in addition to its existing method of respiratory virus screen by direct fluorescent antibody (RESPFA). The RESPAN method identified viral infections in a significant percentage of patients testing negative with the RESPFA method. False negative reporting has the potential to result in unnecessary antibiotic therapy for presumed bacterial infection and increased length of hospital stay. This has implications for increased antimicrobial resistance and higher financial expenditure. The Infectious Disease Society of America (IDSA) stewardship guidelines recognize inappropriate antibiotic use as a surrogate marker for the avoidable impact of resistance. IDSA also recognizes reduction in healthcare costs without adverse
impact to quality of care as a secondary goal of antimicrobial stewardship initiatives. Therefore, the study site’s laboratory will use RESPAN for the 2012-13 viral season in addition to a Flu/Respiratory Syncytial Virus PCR. 

Purpose and Methods: The purpose of this study is to evaluate the effects of using respiratory viral panel results with improved sensitivity in conjunction with pharmacist intervention to decrease inappropriate antibiotic use, antibiotic days of therapy (DOT) and hospital length of stay (LOS). Primary endpoints measured will be LOS, DOT, and percentage of antibiotic stewardship team (AST) pharmacist initiatives resulting in discontinuation or de-escalation of antibiotic therapy. Secondary endpoints will include hospital admission rate from the emergency department for patients with positive and negative viral test results, potential financial savings due to decreased LOS, and potential antibiotic stewardship benefits from decreased antibiotic DOT. This retrospective/concurrent observational study will be conducted in an urban tertiary care hospital. For the 2012-13 viral season, the study site’s laboratory will send a daily report of positive respiratory viral tests to the study site’s AST. Pharmacists will determine if those patients are receiving antibiotic therapy for respiratory infections via inpatient electronic records and contact the providers to facilitate antibiotic discontinuation or de-escalation. Patients less than 18 years old will be excluded. Patients not admitted to the study site hospital and those not on antibiotics for a respiratory infection at the time of a positive viral panel will be excluded. Results of all interventions will be recorded. The 2012-13 viral season will be compared to historical data from the 2010-11 and 2011-12 seasons to assess primary and secondary endpoints. Results will be discussed.

ACPE #:0126-9999-13-499-L01-P

Learning Objectives:
- Describe the pharmacist role in an interdisciplinary antibiotic stewardship initiative in a large tertiary hospital.
- Describe the effects of utilizing respiratory viral tests with improved sensitivity in conjunction with pharmacist intervention with regards to potential stewardship and financial benefits.


**490 - IMPLEMENTING BASAL/BOLUS INSULIN PROTOCOL IN A RURAL HOSPITAL FOR GLYCEMIA CONTROL IN NON-CRITICALLY ILL ADULT INPATIENTS**

A6. Diabetes Care - Diabetes Agents and Devices

Presented by:

Mohamed Sallout, PharmD
St. Luke's Magic Valley Regional Medical Center
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Presenting on Wednesday, May 15 at 4:30 PM in Mission Bay Foyer

American Diabetes Association guidelines do not recommend using sliding scale insulin as the sole method for controlling inpatient hyperglycemia. Instead, the guidelines recommend using basal/bolus insulin. The objective of this project was to implement basal/bolus insulin protocol to control hyperglycemia in inpatient non-critically ill adult patients at St. Luke’s Magic Valley (rural hospital). Inpatient blood sugars and hypoglycemia episodes were evaluated retrospectively. Protocol implementation and data evaluation of blood sugars were exempt from IRB as it is a quality improvement project. A search of all available primary literature was conducted to determine most current standards of practice for adult hyperglycemia management using basal/bolus insulin. Basal/bolus insulin protocols utilized by other hospitals to manage inpatient hyperglycemia were identified. An order set for
hyperglycemia management in adult non-critically ill patients was developed. Educational sessions for staff were developed. Implementation was done in collaboration with multi-disciplinary teams. The effect of protocol implementation on patient’s average blood glucose and hypoglycemia episodes were evaluated. An electronic medical record database was used to collect point of care blood glucose results for the period between 08/09/12 and 09/23/12 and the period between 03/15/13 and 04/30/13 for patients in medical, cardiopulmonary, rehabilitation, and surgical unit at St. Luke’s Magic Valley. Two groups of patients were randomly selected from patient pool pre and post protocol implementation. The primary end point was change in average blood glucose. Secondary end point was change in percentage of patients with blood glucose less than 70 mg/dl at any time during their hospital stay.

ACPE #:0126-9999-13-500-L01-P

Learning Objectives:
- Describe the different steps required to plan and implement basal/bolus insulin protocol in St. Luke’s Magic Valley Regional Medical Center (rural hospital).
- Explain the effect of implementing basal/bolus insulin protocol on patient’s average blood glucose and percentage of patients experiencing hypoglycemia episodes at St. Luke’s.


491 - EVALUATION OF EMPIRIC ANTIBIOTIC COVERAGE FOR HOSPITAL-ACQUIRED PNEUMONIAS BASED ON LOCAL MICROBIOLOGIC DATA

A1. Infectious Disease - Anti-infective Agents

Presented by:
Matthew Sasaki, PharmD
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Presenting on Wednesday, May 15 at 8:00 AM in Mission Bay

Introduction:
Guidelines published by the Infectious Diseases Society of America (IDSA) recommend that initial empiric therapy of Hospital-acquired (HAP), Ventilator-associated (VAP) or Healthcare-associated pneumonias (HCAP) consist of two antibiotics with potential activity against Pseudomonas aeruginosa. At Renown Regional Medical Center the empiric Gram-negative regimen of choice is piperacillin-tazobactam and ciprofloxacin. The primary objective of this study is to determine if the initial empiric treatment of HAP or VAP with piperacillin-tazobactam and ciprofloxacin offers additional benefit over piperacillin-tazobactam monotherapy based on antimicrobial sensitivity data. The secondary objective is to determine if piperacillin-tazobactam is the most appropriate anti-pseudomonal beta-lactam for empiric treatment.

Methods:
The hospital’s electronic medical record system will be used to retrospectively review culture and sensitivity results of patients that were diagnosed with pneumonia and had a bronchoalveolar lavage in the trauma ICU at Renown Regional Medical Center between the years 2010-2012. The organisms cultured and sensitivities to piperacillin-tazobactam, ciprofloxacin, meropenem, tobramycin, tigecycline, cefotaxime, ceftazidime, ceftriaxone, and cefepime will be recorded. To evaluate the adequacy of coverage organisms will be classified as sensitive to piperacillin-tazobactam and ciprofloxacin, resistant to piperacillin-tazobactam and sensitive to ciprofloxacin, sensitive to piperacillin-tazobactam and resistant to ciprofloxacin, or resistant to both piperacillin-
tazobactam and ciprofloxacin. Additionally, the sensitivities to ceftazidime, cefepime, meropenem, and piperacillin-tazobactam will be compared to determine if another anti-pseudomonal beta-lactam should be substituted for piperacillin-tazobactam.

Results/Conclusions:
Will be presented

ACPE #:0126-9999-13-501-L01-P
Learning Objectives:
- Describe the rationale for providing combination gram-negative coverage in the treatment of VAP.
- Describe how patterns of antibiotic resistance in bacteria responsible for VAP impacts empiric broad spectrum antibiotic therapy.


D1. Medication Safety

Presented by:
Jennifer Sass, PharmD
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Jennifer.sass@va.gov

Presenting on Wednesday, May 15 at 3:00 PM in Palm I

Introduction:
The objective of this observational, retrospective chart review is to ensure patient safety by evaluating the prescribing patterns and use of citalopram at the Veterans Affairs Puget Sound Health Care System (VAPSHCS). It is hypothesized that providers are prescribing in accordance with the recommendations from the FDA concerning using lowered citalopram doses as appropriate (prescribing citalopram <40mg per day for adults aged 18-60 years old and <20mg per day for adults greater than 60 years old). It is also hypothesized that if patients are taking higher doses than recommended by the FDA that patients are being appropriately monitored by their provider (EKG, pulse, magnesium and potassium levels).

Methodology:
Electronic medical records will be examined for citalopram indication, dose, changes in therapy such as dose increases or reductions, frequency, length of therapy, age, gender, comorbid cardiovascular diseases, doctor, frequency of mental health/psychiatric clinic visits, frequency of emergency room visits due to depression, documentation of decompensation of depression symptoms, as well as monitoring of EKG, pulse, magnesium, and potassium levels. Subjects 18-60 years old who were taking citalopram greater than 40mg per day and subjects over 60 years old who were taking greater than 20mg per day on August 25th, 2011 at the VAPSHCS, Seattle Division will be included in this descriptive study. No patients were excluded from this study. The primary end point was citalopram dosage appropriateness after the issuance of the FDA warning on 8/25/2011 concerning citalopram use in doses greater than 40 mg per day for subjects 18-60 years old and greater than 20 mg per day for subjects over 60 years old. Key secondary endpoints included monitoring of EKG, pulse, magnesium and potassium levels, number of mental health clinic visits, and documentation of decompensation of depression symptoms.

Findings/Progress to Date:
Introduction
More than 20 million U.S. adults (>10%) are estimated to have chronic kidney disease (CKD) and the number is expected to continue to grow due to increasing prevalence of diabetes, hypertension, and obesity. Anemia is a common complication of chronic kidney disease (CKD). Erythropoietin production is often impaired as a result of CKD and erythropoiesis-stimulating agents (ESAs) such as darbepoetin alfa and epoetin alfa are used to raise hemoglobin levels back to the normal range. In June 2011, the Food and Drug Administration (FDA) released a drug safety communication regarding more conservative hemoglobin targets to improve the safe use of ESAs. According to recent clinical data, using ESAs to a target hemoglobin of >11 g/dL may increase the risk of death, serious adverse cardiovascular events, and stroke. ESA labels have subsequently been updated with guidelines for safe use. The specific aim of this study is to determine if ESAs are being prescribed within the updated 2011 FDA guidelines in patients with anemia of CKD in order to protect patient safety.

Research Design
This study will be a single center, observational, retrospective chart review of electronic health records using the computerized patient record system (CPRS).

Methodology
Subjects with a diagnosis of CKD who have an active prescription for epoetin alfa or darbepoetin alfa from January 1, 2011 to June 30, 2012 at VA Puget Sound Health Care System will be included in the analysis. Patients on ESAs for reasons other than anemia of CKD and those with a diagnosis of cancer will be excluded. Approximately 175 patients will be included in the analysis. The focus of this study will be on supratherapeutic hemoglobin levels (incidence of hemoglobin >11 g/dL in patients with anemia of CKD on dialysis and >10 g/dL in patients with anemia of CKD not on dialysis). The primary measurements to assess the safe use of ESAs will be hemoglobin levels, ESA dose, and frequency of actions taken by providers in adjusting ESA dose if hemoglobin levels are above the recommended level (by decreasing or interrupting dose). Basic statistical descriptive methods will be used to summarize each of the outcomes.

Results and Conclusion
Will be presented.
Learning Objectives:

Explain why the FDA has recommended more conservative hemoglobin targets for ESAs.
Describe the modified dosing recommendations for erythropoiesis-stimulating agents presented by the FDA in June of 2011.


494 - A FAILURE MODES EFFECTS ANALYSIS OF THE HANDWRITTEN TOTAL PARENTERAL NUTRITION ORDER PROCESS IN A LARGE PEDIATRIC MEDICAL FACILITY: IS IT TIME TO GO ELECTRONIC?
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Jacqueline Schnee, PharmD
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Presenting on Wednesday, May 15 at 9:30 AM in Palm II

Background: It has been demonstrated that Computerized Provider Order Entry, or CPOE, improves patient care, safety, and satisfaction by reducing medical errors. Children especially are at higher risk for adverse drug events associated with transcription error, which is estimated as nearly triple that of adults. Children’s Hospital Central California (CHCC) currently utilizes CPOE technology for medication orders; however Total Parenteral Nutrition (TPN) orders continue to be handwritten. The use of CPOE for TPN orders has been shown to decrease the number of phone calls pharmacists make to prescribers to correct TPN ordering problems that could be addressed at the time of order entry. The primary objective of this study was to identify the risks associated with CHCC’s current TPN process related to prescription, transcription, preparation, and administration. Secondary objectives included investigating electronic TPN order writing programs and determining their applicability to the Children’s Hospital Central California System.

Methods: This was a prospective, observational analysis of TPN workflow separated into three groups: doctors, pharmacy personnel, and nurses. Potential risks were analyzed to determine whether transition to an internet-based TPN order entry platform can ensure safer ordering, production, delivery and administration of TPN products. Additionally, electronic TPN order writing software was evaluated to determine which of the identified risks could be minimized or eliminated. Results and conclusions will be presented.

ACPE #:0126-9999-13-504-L04-P
Learning Objectives:

Identify the risks associated with a handwritten total parenteral nutrition (TPN) order process.
Discuss the pros and cons for implementing a web-based TPN order entry platform.

495 - OPTIMIZATION OF A CLINICAL DECISION SUPPORT SYSTEM: A PRE- AND POST-INTERVENTION STUDY
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
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Presenting on Wednesday, May 15 at 10:00 AM in Palm II

Background: Clinical decision support (CDS) “Allows for the comparison of various pieces of patient information in order to generate patient-specific advice or alerts”. CDS software must balance detecting clinically important interactions with inundating users with inconsequential or clinically insignificant information. Intrusive, irrelevant and time-consuming alerts can lead to a phenomenon called alert fatigue, an indifference that arises where both important and non-important alerts are ignored indiscriminately. To optimize the CDS system, accuracy of alerts needs to be measured and evaluated in order to target the high-impact, clinically relevant alerts and avoid alert fatigue.

Methods: The first phase of this study is undertaking the process of redefining the response choices for overriding alerts in an effort to gather more meaningful data as to why clinicians override alerts. Once data are available based on the new responses, a pre-intervention analysis will take place. That information will then be used to formulate a plan to increase the positive response rate of alerts in the CDS system. The effects of these changes will be measured in a post-intervention group. Analysis of the medication alerts aims to improve the overall specificity of alerts in the system and decrease the total number displayed. This has the possibility of increasing awareness of clinically relevant alerts, increasing the likelihood of a positive response and potentially avoiding alert fatigue.

ACPE #:0126-9999-13-505-L01-P
Learning Objectives:
- Explain advantages and limitations of clinical decision support.
- List potential improvement strategies for clinical decision support systems.


496 - PROSPECTIVE COMPARISON OF AUTOMATED VS. STAFF MANAGED WARFARIN DOSING IN A MILITARY HEALTHCARE SYSTEM.
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
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Presenting on Wednesday, May 15 at 10:30 AM in Palm II
Despite the introduction of newer anticoagulants, warfarin remains the most widely prescribed medication for the prevention of stroke. It remains the drug of choice for primary and secondary prevention of thrombotic events in patients with atrial fibrillation (A fib), Atrial Flutter (A fl), prosthetic heart valves, and venous thromboembolic events specifically deep vein thrombosis (DVT) or pulmonary embolism (PE). Warfarin's narrow therapeutic index, drug interactions, patient specific dose response, disease specific anticoagulation requirements, and food interactions require consistent monitoring of the International Normalized Ratio (INR). Software programs have aided anticoagulation clinics in large scale patient management for decades and technology advancements have improved software capabilities over time. This study was focused on determining if converting from the current staff dosing practice model, using the 1996 Bristol-Myers Squibb Pharma Company’s CoumaCare software, to a program with an automated dosing function, made by Standing Stone, INC, provides better management of the Madigan Health Care System beneficiary's INRs. The Time in Therapeutic Range (TTR) for INRs was established as the primary end point and compared prospectively for 5 months (1 Dec 2012 to 30 Apr 2012) between patients currently enrolled in the Anticoagulation Management Clinic (AMC). Eight hundred and ninety two patients with either A fib, A fl, DVT, PE, or valve replacement were separated into one of two groups. Group 1 was managed using Standing Stone’s default dosing algorithm (INR Goal/Current INR)^(1/3)*Current Weekly Dosage). Staff members responsible for reviewing the automated dosing suggestions were allowed to override the dosing algorithm when clinically necessary. Each override was evaluated based on a 3 question survey and tracked as a secondary end point. Group 2 was managed by staff members using conventional dosing adjustments just as they did prior to conversion to the newer software. Patients were exclude from the study if they had disease states that required anticoagulation other than those listed above, had unconventional INR ranges, or were enrolled in the AMC after the study began. INR results associated with procedural anticoagulation bridging, using other anticoagulants such as low molecular weight heparins, were held out of the data until procedures were completed. In all, 882 patients were included in the study with 432 patients assigned to the “Automated” group and 450 assigned to the “Staff” group. Data was derived from the “Reports” function within the Standing Stone software and reviewed. Madigan Army Medical Center Institutional Review Board approval was in process at the time the abstract was submitted to Western States Conference as Platform Presentation Category C2.

ACPE #:0126-9999-13-506-L01-P
Learning Objectives:
- Describe the risk associated with Supra-therapeutic and Sub-therapeutic INR results.
- Explain the clinical outcomes associated with different modalities used to generate warfarin doses to maintain an INR in the prescribed treatment range.


497 - DEVELOPMENT AND IMPLEMENTATION OF AN AMBULATORY PEDIATRIC ONCOLOGY PHARMACIST
B6. Pediatric or Gender Specific Care

Presented by:
Eve Segal, PharmD
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Presenting on Wednesday, May 15 at 2:00 PM in Sunset II
Pediatric hematology and oncology is a specialty associated with complex care and management. In 2012, an estimated 12,060 new cases were expected to occur among children aged 0-14 years with approximately 1,340 deaths. In the spectrum of cancer occurrence, childhood cancers are extremely rare compared to adults. Pediatric cancers require years of intensive therapy and specialized care. Cancer management in pediatrics demands a dedicated interdisciplinary team that is organized and can help manage the complications, toxicities, and challenges associated with pediatric cancers.

Many journal articles have been published about the benefits of clinical pharmacy services in pediatrics. A study at Doernbecher Children’s Hospital documented that clinical pharmacy services provided in a pediatric intensive care unit resulted in an increase in interventions including dose changes, drug information, and cost savings. Due to the multitude of documented benefits with a dedicated pediatric pharmacist, the pharmacy department at St. Luke’s Mountain States Tumor Institute (MSTI) formulated a pilot to measure the effectiveness of having a dedicated ambulatory pediatric oncology pharmacist.

At St. Luke’s the MSTI ambulatory pediatric clinic is rapidly growing and changing. The current staffing model at MSTI has a dedicated pharmacist working in the adult infusion center, however, there is no established pharmacist working in the ambulatory pediatric clinic. In order to expand pharmacy presence, a quality improvement project was developed in this patient care area utilizing a decentralized pharmacist model. The pilot focuses on four key areas to measure effectiveness: oral chemotherapy management, medication reconciliation, pharmacists’ interventions, and volume of chemotherapy orders processed. Retrospective data will be collected and measured using the 2012 ASCO QOPI parameters of documentation regarding oral chemotherapy and medication management. Prospective data during the active pilot phase will be compared to the historical control group. Subjects in the control group will be matched to subjects in the intervention group by the ASCO QOPI measurement.

The primary outcome of this study is measuring the change and effectiveness in health resource utilization by having a dedicated pharmacist in the pediatric clinic. Secondary measurements will include improvements in documentation and volume of chemotherapy processed. Data collection is currently ongoing.

ACPE #:0126-9999-13-507-L01-P

Learning Objectives:
1. Describe the importance of improving workflow by having a dedicated pediatric oncology pharmacist in a clinic.
2. Identify the impact pharmacists may have when providing services such as oral chemotherapy education and medical reconciliation.


498 - REFINING CLINICAL DECISION SUPPORT: EVALUATING RESPONSES TO THERAPEUTIC DUPLICATION ALERTS
D1. Medication Safety

Presented by:
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Presenting on Wednesday, May 15 at 3:30 PM in Palm I
INTRODUCTION: Clinical Decision Support (CDS) is a tool integrated with computerized physician order entry (CPOE) to compare patient specific data compared against a knowledge base, allowing the user to make more informed decisions about pharmacotherapy. While the positive effects of CPOE/CDS are documented in the literature, several studies have identified alert fatigue among prescribers overburdened by having to determine the usefulness of these alerts. At Long Beach Memorial, this problem is particularly profound with therapeutic duplication alerts for which override rates can exceed 90%. Still, it is unknown whether these alarms are useful or producing alert fatigue; therefore, little action has been taken to tailor our clinical decision support tools. The primary objective of this study was to evaluate whether or not the therapeutic duplication alerts were clinically appropriate.

METHODOLOGY: As a preliminary assessment, six months worth of data involving therapeutic duplications was collected and grouped by drug class. The classes consisted of drugs that caused alerts with monthly override rates greater than 90% and high risk drug classes. These drug classes were presented to a multidisciplinary Medication Error Oversight Committee whose members selected specific classes for further review. A retrospective chart review was conducted to evaluate the clinical situations in which each drug-drug pair was overridden for various clinical reasons.

RESULTS AND CONCLUSION: To be presented.

ACPE #:0126-9999-13-508-L01-P
Learning Objectives:
Describe potential pitfalls in the use of clinical decision support systems and the pharmacist’s role in addressing these concerns
Identify clinical decision support features that can enhance patient safety without compromising efficiency


499 - DIRECT ACTING ANTIVIRALS FOR HEPATITIS C: SHARING OUR EXPERIENCES, CHALLENGES, AND SOLUTIONS
B1. Ambulatory Care

Presented by:

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Presenting on Wednesday, May 15 at 10:30 AM in Royal I

Introduction
Hepatitis C is the primary cause of death from liver disease and the leading cause of liver transplantation in the United States. Recommended screening from the Centers for Disease Control and Prevention (CDC) would identify significantly more patients affected with hepatitis C. With the availability of new direct acting antiviral (DAA) agents, promising results have been reported when one of these agents is added to the standard of care therapy (peg-interferon and ribavirin). This triple therapy can lead to an increased sustained virologic response of over 70% compared to 40% with only dual therapy. However, these medications have long and complex treatment schedules and are associated with numerous side effects. With their medication management expertise, pharmacists can contribute to the management of this complex disease state. The objective of this project was to propose a new model of care to further improve upon current patient care management.
Methodology
Various hepatitis C management practice models were studied from Kaiser Permanente facilities outside Southern California. Medication use evaluations (MUEs) were conducted via retrospective chart review to evaluate the current practice of hepatitis C genotype 1 management at Kaiser Permanente Southern California (KPSC). Patients with boceprevir or telaprevir prescription from all KPSC medical centers were reviewed. MUEs addressed areas such as appropriate treatment follow up, side effects management, and therapy completion patterns. Furthermore, a safety net process was developed to monitor the dispensing of these expensive medications from outpatient pharmacy. A survey was conducted to identify current care practices at all KPSC medical centers. Based on the findings from MUEs and the survey, a business case proposal for multidisciplinary team management of hepatitis C will be developed. Cost savings opportunities will be calculated and return on investment (ROI) will be determined to justify the business case.

Results and Conclusions
MUE results will help identify potential gaps in management of hepatitis C treatment. With the help of a multidisciplinary team that includes a pharmacist, these gaps will be filled to improve the clinical and financial aspect of hepatitis C management. MUE observations and future plans for project will be discussed.

ACPE #:0126-9999-13-509-L01-P
Learning Objectives:
- List the findings from medication use evaluations of direct acting antivirals
- Describe the potential role for pharmacists in the management of chronic hepatitis C


500 - COMPARISON OF PROVIDER PRESCRIBING PATTERNS BETWEEN IRAQ/AFGHANISTAN VETERANS AND VIETNAM VETERANS WITH COMBAT PTSD
A5. Neuro-Psych or Pain Management Agents

Presented by:
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Presenting on Wednesday, May 15 at 10:00 AM in Palm III

Post-Traumatic Stress Disorder (PTSD) is the most prevalent mental health disorder among Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) veterans. Studies have indicated differences in characteristics between Vietnam veterans and OIF/OEF veterans which may potentially result in varying treatment strategies. Current treatment guidelines are based primarily on research studies in Vietnam veterans. The primary objective of this study is to identify the differences in pharmacologic treatment between two distinct cohorts of veterans with combat-related PTSD, Vietnam veterans and OIF/OEF veterans. The secondary objectives are to identify other concurrent mental health disorders amongst the two groups, and to compare the incidence of opiate prescribing between the two populations.
This is an IRB-approved retrospective chart review of patients with combat-related PTSD who are being treated within the VA Long Beach Healthcare System. Data collection will come from the VISN 22 Data Warehouse and also through a chart review of medical records. The study will include veterans with combat-related PTSD who actively received care through Primary Care or Mental Health during the 6 month study period. Data will include three months of active prescriptions during the study period including antidepressants, antipsychotics, mood
stabilizers, anxiolytics, hypnotics, opiates, prazosin, and medications used to manage addiction. Additionally we will gather basic demographic data and data regarding co-morbid mental health disorders. Descriptive statistics with means, median, and quartile will be conducted. The differences between the two cohorts will be evaluated using descriptive statistics and t-tests, chi-square or Fisher's exact test, as appropriate. Results and conclusion will be presented.

ACPE #:0126-9999-13-510-L01-P
Learning Objectives:
1. Describe the differences in treatment patterns between Vietnam veterans and OIF/OEF veterans with combat-related PTSD.
2. Describe the frequency of opiate prescribing among patients with PTSD.


501 - RETROSPECTIVE EVALUATION OF AN INPATIENT PHARMACIST-MANAGED WARFARIN-CONSULTING SERVICE
B4. General Clinical Practice

Presented by:
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Presenting on Wednesday, May 15 at 3:00 PM in Royal III

Background: In 2012, The Joint Commission included warfarin, the most widely prescribed anticoagulant in North America, in a National Patient Safety Goal to reduce the likelihood of patient harm associated with the use of anticoagulant therapy. Research has suggested that pharmacist-managed anticoagulation services can help reach this goal while also reducing patients’ hospital length of stay. Prior to November 26, 2012, there was no inpatient pharmacist-managed warfarin-consulting service at UCSD Health System. From November 26, 2012 to January 18, 2013, an inpatient pharmacist-managed consulting clinical service was piloted. The primary objective of this study is to describe interventions made by an inpatient pharmacist-managed warfarin consulting pilot service. The secondary objective is to compare rates of all 30 day inpatient readmissions and ED visits due to warfarin complications in patients in the pilot service with a historical control group.

Methods: This is a retrospective, observational study of adult medicine and cardiology patients receiving inpatient warfarin therapy with pharmacist dosing consultation at UCSD Health System – La Jolla. For the primary objective of this study, pharmacist interventions such as patient counseling, dose adjustment recommendations, patients referred to outpatient anticoagulation clinics, and scheduled outpatient appointments will be described. For the secondary objective, retrospective data analysis will be conducted on the pilot program data and a control group. The historical control group will consist of inpatient adult medicine or cardiology patients prescribed warfarin that were hospitalized and discharged during the five weeks prior to the pilot period, October 22, 2012 to November 23, 2012. All patients who were included in the pilot will be included in the study. Patients will be excluded from the study if they were less than 18 years of age. Results and conclusions will be presented.

ACPE #:0126-9999-13-511-L01-P
Learning Objectives:
List the interventions that pharmacist consultation may provide to positively impact inpatient warfarin management.
Describe the impact of pharmacist consultation on rate of ED visits and inpatient readmissions related to warfarin complications.


**502 - PERIPHERALLY INSERTED CENTRAL CATHETER (PICC) INFECTIONS ASSOCIATED WITH PARENTERAL NUTRITION (PN)**

A4. Gastrointestinal Care - Gastro or Nutritional

**Presented by:**

**Amanda Shearin, PharmD**
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*Presenting on Tuesday, May 14 at 2:30 PM in Mission Bay Foyer*

Parenteral nutrition (PN) is an intravenous form of nutrition support used in patients who are unable to utilize their gastrointestinal tract to achieve adequate nutritional intake. Central venous access is required to infuse the solution due to the high osmolarity of the components. Although this form of nutrition is essential and life saving in these patient populations it has been associated with an increased risk of central catheter related blood stream infections.

The incidence of infection with PN varies throughout the literature and is confounded by the type of central line, glucose control and catheter care. Hyperglycemia and hyperalimentation during the beginning years of PN use was linked to an increase in complications and risk of infection. Protocols for glycemic control have been implemented to avoid the possible risk of increased infection associated with hyperglycemia. A recent study found that with proper catheter care the rate of central line infections was lower in patients receiving PN via intrajugular and subclavian catheters. Current guidelines recommend the use of tunneled catheters or peripherally inserted central catheters (PICC) for central access due to the lower risk of infection. The objective of this study is to assess the incidence of PICC line infections associated with PN infusions compared to PICC lines not receiving PN in the inpatient setting with the current standard catheter care at the University of Arizona Medical Center.

This is a retrospective cohort study of data obtained through patient medical record review and the Infection Control database at the University of Arizona Medical Center. This is a comparative study between two patient populations 1) Patients with a PICC line receiving PN, 2) Patients with a PICC line not receiving PN between January 1st, 2011 to June 30th 2012. Patients aged 18-89 years old who received PN via a PICC line will be included in the study. Patients will be excluded if they were admitted for a PICC line infection or had a positive blood culture from PICC within 48 hours of admission. The incidence of blood stream infection per PICC day will be compared between the PN cohort and the cohort that did not receive PN.

ACPE #:0126-9999-13-512-L01-P
Learning Objectives:

- Describe the role of PN in PICC line infections.
- List appropriate techniques to decrease the risk of PICC line infections associated with PN.

503 - COST COMPARISON OF A PROCESS CHANGE: COMPOUNDED VERSUS PRE-MIXED PARENTERAL NUTRITION THERAPY

A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

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Presenting on Tuesday, May 14 at 2:00 PM in Mission Bay Foyer

Purpose: Parenteral nutrition (PN) has been shown to be a risk factor for the development of central line-associated bloodstream infections (CLABSI). CLABSI have a documented treatment cost nearing $12,000. Although PN solutions are prepared with aseptic technique, each manipulation into the PN bag may result in contamination. Prior to the beginning of 2012, PN solutions at our institution were individually compounded by adding each ingredient, by hand, to an empty PN bag. This process was changed to comply with USP 797 with an aim to increase efficiency by decreasing preparation time. The new process resulted in the use of pre-mixed PN formulations, requiring less manipulations of the sterile environment. This process improvement could have a cost-savings impact by decreasing the time and number of ingredients required to prepare PN, with also the potential to improve patient outcomes by decreasing the risk of CLABSI. This study differs from similar studies that have been done by focusing on the direct impact of changing the PN preparation process by analyzing one institution before and after the process change took place. The objective of this study is to determine a cost-savings impact associated with changing the process in which PN solutions are prepared at the New Mexico VA Health Care System (NMVAHCS) and its potential effect on the incidence of CLABSI.

Methods: This study will be conducted as a retrospective cohort chart review. The treatment groups, “compounded PN” and “pre-mixed PN”, will be identified by the ingredients of their PN formulation correlating to the time-frame in which they received PN therapy. The primary outcome will be a comparison of direct and indirect costs associated with PN therapy for each study population including acquisition cost of ingredients, length of therapy, and time to prepare PN solution. The secondary outcomes of this study include the incidence of CLABSI and catheter-related bloodstream infections. The results of this study are pending data collection, and will be presented at Western States Conference.

ACPE #:0126-9999-13-513-L01-P

Learning Objectives:

Explain the impact that introducing contaminants to PN solutions can have on the risk of central line-associated bloodstream infections.
Describe how changing from compounded to pre-mixed parental nutrition solutions has the potential to improve patient outcomes.


504 - EVALUATION AND IMPLEMENTATION OF THE PHARMACY PRACTICE MODEL INITIATIVE (PPMI) IN A COMMUNITY HOSPITAL SETTING

C1. Pharmacoeconomics, Admin or Financial Mgmt
Background: Healthcare reform is shifting the emphasis from paying solely for the provision of services to a more accountable care model based on higher quality and safer care provided at a lower cost. In response to this changing healthcare landscape, the Pharmacy Practice Model Initiative (PPMI) was developed by the American Society of Health-System Pharmacists (ASHP) and the ASHP Research and Education Foundation as a template for defining a practice model that supports the most effective use of pharmacists as direct patient care providers. At UW Medicine-Valley Medical Center (UW-VMC) there has been an ongoing emphasis on improving and advancing the role of the pharmacist with respect to direct patient care related activities with the goal of improving safety and outcomes.

Objectives: The primary objective of this evaluation is to complete the ASHP PPMI Hospital Self-Assessment Survey to identify areas for potential process improvement, implementation or integration into the current pharmacy practice model. The secondary objective of this evaluation is to examine the impact of an advanced pharmacy practice model on both safety and quality of care metrics at UW-VMC.

Methods: The ASHP PPMI Hospital Self-Assessment Survey was completed and resulted in a customized, institution-specific action plan for evaluation. Items from this action plan were reviewed and prioritized based on potential impact on patient care, feasibility and ease of implementation. Progress on PPMI implementation action items at UW-VMC will be tracked utilizing scoring changes from the baseline assessment. In addition to the PPMI, a survey of pharmacists was conducted to obtain a baseline knowledge assessment with regard to healthcare reform and institution specific initiatives including core measures and patient satisfaction survey scores. Data specific to these metrics will be gathered and analyzed to assess the potential impact of clinical pharmacy services.

Results and Conclusion: Results and conclusion of this evaluation are in progress and will be presented.

ACPE #:0126-9999-13-514-L04-P

Learning Objectives:
- Describe the primary goals measured by the ASHP PPMI National Dashboard
- Describe quality care metrics that pharmacists can impact as part of a multidisciplinary team


505 - EFFECT OF A STANDARDIZED CHECKLIST ON BEST PRACTICE ADHERENCE AND CLINICAL OUTCOMES IN AN INTENSIVE CARE UNIT

Presented by:

Christopher Silag, PharmD
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Presenting on Wednesday, May 15 at 10:00 AM in Executive 713
Systematic checklists have been utilized in high risk commercial applications as such as aviation and industrial engineering as a means to reduce error rates and catastrophic failure. Their use and scope in inpatient practice has so far been limited to surgical and post-anesthesia care, or on specific events such as venous thromboembolism (VTE) or ventilator-associated pneumonia (VAP).

In March 2012 at NorthBay Medical Center in Fairfield, California and VacaValley Hospital in Vacaville, California, a streamlined checklist for use in organizing the discussion of patient care was implemented on multidisciplinary rounds in their respective intensive care units (ICU). The simplified checklist supplanted a previously used data collection sheet that served as a repository of information.

The primary objective of this retrospective, multi-center chart review is to compare adherence rates to VTE and stress ulcer prophylaxis (SUP) best practices before and after the institution of a standardized checklist. Adherence is defined as having an active mechanical or pharmacological order at the 48th hour of admission or clinical justification for holding treatment.

Patient charts will be randomly selected for those aged 18-64 with ICU admissions and lengths of stay > 48 hours between April 1, 2012 to September 30, 2012 and September 1, 2011 to February 29, 2012. The study excluded end-stage renal disease, fulminate liver failure, hospice/comfort care, cancer, post-operative < 3 days, transplant, post-partum < 6 weeks, positive toxicology screen, pregnancy, trauma, and post-operative care patients.

The secondary objective is to compare clinical outcomes between these two groups with respect to glycemic control, bleeding, and infection resolution. Patients will be evaluated using surrogate markers such as glucose levels, hemoglobin changes, and systemic inflammatory response syndrome (SIRS) criteria at set time points. Results and conclusions will be presented and discussed.

ACPE #:0126-9999-13-515-L01-P
Learning Objectives:
- Describe the impact of a checklist on adherence to best practices in the ICU setting
- List potential interventions that may be ascertained through the use of a systematic checklist in an ICU setting


506 - THE IMPACT OF CLINICAL PHARMACISTS’ PARTICIPATION IN POST-STROKE PATIENT CARE IN AN ACUTE CARE HOSPITAL

B4. General Clinical Practice

Presented by:

Michele Siu, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Royal III

Introduction:
Approximately 795,000 strokes occur each year in the United States, making it a major cause of mortality and morbidity. With one quarter of these strokes representing recurrent events, it is imperative to identify and appropriately manage those who are at high risk. In collaboration with the American Heart Association (AHA)/American Stroke Association (ASA)/Brain Attack Coalition (BAC), The Joint Commission (TJC) developed a
set of national hospital inpatient quality measures for patients who are admitted for ischemic stroke to ensure
better outcomes. The pharmacy stroke program was implemented in the Washington Hospital Healthcare
System (WHHS) in January 2013 to address TJC core measures and assess current clinical guidelines from the
American College of Chest Physicians (CHEST) and AHA/ASA for the prevention of subsequent strokes in patients
with ischemic stroke or transient ischemic attack (TIA). The program addresses key stroke core measures and
evidence-based recommendations from the CHEST and AHA/ASA guidelines including venous thromboembolism
(VTE) prophylaxis, antithrombotic therapy, anticoagulation therapy for atrial fibrillation/atrial flutter, and statin
therapy. This includes meeting quality measures and ensuring optimal medication regimens during
hospitalization and upon discharge.

Objective:
The objective of this study is to describe the impact of pharmacy stroke program on post-stroke patient care.

Methodology:
Ischemic stroke or TIA patients who met inclusion and exclusion criteria before and after implementation of the
pharmacy stroke program are retrospectively reviewed. Data will be retrieved from available patient records
and the pharmacist monitoring form. Data synthesis will include the percentage of patients who are discharged
with statins, concurrent antiplatelet or antithrombotic therapy, presence of related co-morbid conditions such
as atrial fibrillation, and the percentage of patients receiving pharmacologic VTE prophylaxis by hospital day 2.
The number, type and physician acceptance rate of pharmacist interventions will be tabulated.

Primary endpoint:
The percentage of ischemic stroke or TIA patients meeting selected stroke core measures before and after
pharmacy stroke program implementation

Secondary endpoints:
The number and type of interventions made by pharmacists including an analysis of the recommendations that
are accepted or rejected

Results/conclusion: will be presented

ACPE #:0126-9999-13-516-L01-P
Learning Objectives:
List pharmacological agents that are used for patients who have ischemic stroke or TIA in accordance
with the current clinical guidelines and the Joint Commission core measures
Describe the potential benefits of pharmacist involvement in optimizing medication regimen for
secondary stroke prevention


507 - EFFECTIVENESS OF ORAL VERSUS INTRAMUSCULAR VITAMIN B12 FOR
TREATMENT OF MACROCYTIC ANEMIA IN A VETERAN POPULATION
A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

Pamela Slaughter, PharmD
Phoenix VA Health Care System
Pamela.Slaughter@va.gov

Presenting on Tuesday, May 14 at 3:30 PM in Mission Bay Foyer
Introduction: The primary objective of this study is to determine the effectiveness of oral vitamin B12 versus intramuscular vitamin B12 for the treatment of macrocytic anemia due to vitamin B12 deficiency. Methodology: This retrospective chart based review will include veterans 18 years of age or older diagnosed with B12 deficient macrocytic anemia who were converted to oral vitamin B12 from intramuscular vitamin B12 at Phoenix VA Health Care System between 06/01/2010-09/29/2012. Patients included are required to have a minimum of 60 days duration of intramuscular vitamin B12 replacement therapy prior to oral vitamin B12 replacement. Patients being excluded from the study include those with chronic kidney disease, patients on chronic hemodialysis, patients with hematologic malignancies, and initial prescribing of vitamin B12 by a provider outside of the VA. Data will be extracted from medical records via the Computerized Patient Record System and will be entered into a Microsoft Access and Excel database for evaluation. The primary objective will be evaluated by comparing the change in serum hemoglobin level from the last level drawn while on intramuscular therapy to the first follow-up visit no earlier than 60 days from initiation of oral vitamin B12 therapy. Secondary objectives will include evaluation of the change in mean corpuscular volume and serum B12 levels from the last level drawn while on intramuscular therapy to the first follow-up visit no earlier than 60 days from initiation of oral vitamin B12 therapy. Inferential statistics will be used to describe the primary objective; a paired t-test will be used for normally distributed data. Both inferential and descriptive statistics will be used to describe the secondary objectives; a paired t-test will be used to analyze continuous data points, descriptive statistics will be used to describe patient demographics.

Results and Conclusion: Will be presented.

Disclaimer: This study is supported by the Department of Veterans Affairs and is the result of work supported with resources and the use of facilities at the Phoenix VA Health Care System. Investigators are employed through the Phoenix VA Health Care System in Phoenix, Arizona. Contents of this study do not represent the views of the Department of Veterans Affairs or the U.S. Government.

ACPE #:0126-9999-13-517-L01-P

Learning Objectives:
- Describe trends in hemoglobin, mean corpuscular volume, and serum B12 levels in patients converted from intramuscular vitamin B12 replacement therapy to oral vitamin B12 replacement therapy.
- Describe the role of the pharmacist in appropriate selection of vitamin B12 replacement therapy for patients diagnosed with macrocytic anemia related to vitamin B12 deficiency


508 - MEASURING THE CLINICAL IMPACT OF SURGICAL INTENSIVE CARE PHARMACISTS USING DOCUMENTATION IN THE ELECTRONIC MEDICAL RECORD

B3. Critical Care

Presented by:

Tyler Sledge, PharmD
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Presenting on Wednesday, May 15 at 10:30 AM in Executive 713

The Society of Critical Care Medicine and the American Society of Health-System Pharmacists encourage the care of complex critically ill patients through an interdisciplinary care model. It has now become standard for pharmacists to be a part of the critical care multidisciplinary team as their presence has been shown to improve
important ICU outcomes. While technological advances have allowed many pharmacists to expand their clinical practice and collaborative involvement, there is rarely written evidence of their daily recommendations in the patient’s electronic medical record (EMR). This practice is encouraged from ASHP, and has the advantage of ensuring a seamless pass-off of pertinent clinical issues to the receiving team and/or following pharmacist. Additionally, documentation in the electronic medical record provides a unique opportunity to capture the pharmacist’s cognitive and clinical impact in a way that traditional systems of tracking “interventions” fail to do. Therefore, the purpose of this study is to quantify the impact of pharmacists in a surgical intensive care unit (SICU) in an academic medical center using electronic pharmacist documentation.

This project is a descriptive analysis quantifying clinical pharmacist impact through retrospective review of daily pharmacist progress notes left in the electronic medical record. Pharmacists in the SICU have been writing daily progress notes since April 2011. Notes that were written and electronically charted on weekdays from May 01, 2012 to July 01, 2012 will be retrospectively reviewed and units of pharmacist activity will be analyzed. Note content obtained through electronic documentation will be quantified and measured using two scales developed at our institution to show the impact of pharmacist activity. Each unit of pharmacist activity will be given a level of significance according to the ordinal scales which will be analyzed by the principal investigator. The reliability of each scale will be tested with other surgical ICU pharmacists. The primary study outcome of this project is the number of pharmacist activity units stratified by level of significance. Other outcomes evaluated will include number of prevented sentinel events, time required to provide documentation, and amount of pharmacist activity per patient admission.

Results are pending as data will be collected during the spring of the 2013 residency year.

ACPE #:0126-9999-13-518-L04-P
Learning Objectives:
- Explain the top two levels of pharmacist impact from the clinical impact scoring system developed to evaluate daily pharmacist progress notes.
- List the three most common examples of high level pharmacist activity units obtained through review of pharmacist documentation in the electronic medical record.


509 - EVALUATION OF OUTCOMES AND KNOWLEDGE OF PROVIDERS PRE- AND POST-IMPLEMENTATION OF A DIABETES QUALITY IMPROVEMENT PROGRAM
B1. Ambulatory Care

Presented by:
Jenna Sloan, PharmD
University of Wyoming School of Pharmacy and Family Medicine Residency Program - Casper
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Presenting on Wednesday, May 15 at 11:00 AM in Royal I

Introduction: Diabetes mellitus is a complex, chronic illness requiring that many issues beyond blood sugar control be addressed in order to prevent short- and long-term complications. These other issues include, but are not limited to, blood pressure, lipid management, and thrombosis risk. Due to the complexity of diabetes, it is also very important that physicians and other providers be educated about the current evidence-based medicine and recommendations available to improve diabetes care. Additionally, several studies have shown that the implementation of a diabetes quality improvement program improves outcomes. The purpose of this study is to
establish a diabetes quality improvement program that will assist the University of Wyoming Family Medicine Residency Program in Casper, Wyoming, in improving standards of care for patients diagnosed with type 2 diabetes mellitus. Improving the knowledge base and confidence of family medicine residents and other providers when treating diabetic patients will be the primary mechanism for meeting this goal.

Methods: Family medicine residents and other providers were asked to complete two surveys assessing their knowledge and comfort level when treating patients with type 2 diabetes mellitus. The first survey was completed before implementation of the diabetes quality improvement program and education about diabetes was provided to the providers. After completing the initial survey, data about each physician’s patients with type 2 diabetes mellitus was provided to the physician, including the percent of patients meeting each outcome goal to meet standards of care for diabetes. Physicians were then provided evidence-based education from the investigators regarding treatment and management of type 2 diabetes mellitus and specific outcome goals. Standing order sets for laboratory testing were incorporated to help improve diabetes care. Outcomes of this study include provider satisfaction and improvements in standards of care. After education of the physicians was completed and the quality improvement program implemented, outcome measures were re-evaluated.

Physicians were surveyed again to evaluate improvements in their satisfaction with the involvement of pharmacists (investigators) in improving their knowledge base and patient outcomes. The study was determined to be IRB exempt by the IRB committee due to minimal risk to human subjects.

Results and Conclusion: to be presented.

ACPE #:0126-9999-13-519-L01-P

Learning Objectives:

- Explain methods to improve provider knowledge and comfort level when treating patients with type 2 diabetes mellitus.
- Describe diabetes standards of care to improve diabetes outcomes through a quality improvement program.


510 - DEVELOPMENT OF A QUALITY METRICS DASHBOARD TO EVALUATE AMBULATORY CARE PHARMACY SERVICES

B1. Ambulatory Care

Presented by:

**Jenifer Smith, PharmD**  
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*Presenting on Wednesday, May 15 at 11:30 AM in Royal I*

Introduction: Ambulatory care pharmacy is a rapidly growing segment of pharmacy practice in health systems nationwide. Healthcare reform, with the passage of the Affordable Care Act (ACA), will increase demand for outcome-based healthcare through the creation of Accountable Care Organizations and the restructuring of reimbursement rates to be based on quality measures. The National Committee for Quality Assurance’s Patient-Centered Medical Home Model (PCMH) initiative has proposed goals for improving patient access to care, continuity of healthcare, and adoption of evidence-based medicine. Pharmacists are uniquely qualified to collaborate in the management of patients with chronic diseases, which may result in the achievement of quality goals and increased reimbursement rates in the wake of healthcare reform.
The objective of this project is to develop a quality dashboard that will capture the clinical and financial impact of ambulatory care pharmacy services at PeaceHealth Southwest Medical Center (PHSW). Dashboard implementation will be used to identify the strengths and benefits of pharmacy services, as well as opportunities for improvement within the infrastructure to improve patient care.

Methodology: A thorough literature review was conducted to identify national best practices in evaluating ambulatory care pharmacy services, focusing on metrics for clinical outcomes, cost effectiveness, cost avoidance, and workflow efficiency. Additionally, implications from the PCMH initiative and the passing of the ACA were considered for a prospective look into quality evaluation of healthcare. Quality metrics were selected that encompass both therapeutic and operational outcomes of the various pharmacy services at PHSW including anticoagulation services, heart failure discharge medication reconciliation visits, and polypharmacy visits. Metrics were incorporated into site-specific clinical tracking tools that were implemented into ambulatory clinics.

Data collection using the clinical tracking tool is being conducted January – March 2013. Data will be incorporated into a dashboard that will provide pharmacy staff and leadership with a visual representation of the daily activities of ambulatory care pharmacists and their impact on patient care. Additionally, the dashboard can be used to improve resource utilization in these areas.

Results: A majority of the outcomes are self-reported by pharmacy staff. Therapeutic outcomes for anticoagulation services include time within therapeutic range (TTR), number of adverse events associated with bleeding or thromboembolism, and percentage of patients that have clinically significant subtherapeutic/supratherapeutic INR values. Operational outcomes include tracking the number of patient visits, time spent performing various tasks (e.g. patient visits, answering drug information questions, scheduling patient appointments, office tasks such as faxing and copying), and comparing budgeted and actual pharmacist hours.

Data collection in the clinical tracking tool and development of final dashboard are currently in progress.

ACPE #: 0126-9999-13-520-L01-P
Learning Objectives:
- Describe process for developing and implementing a clinical tracking tool and dashboard to evaluate pharmacy services
- Explain how dashboards can facilitate improving patient care for pharmacy-run ambulatory care services


511 - EVALUATING THE USE OF LEVOFLOXACIN IN URINARY TRACT INFECTION (UTI): A RETROSPECTIVE REVIEW AND ANALYSIS
A1. Infectious Disease - Anti-infective Agents

Presented by:
Allorie Smith, PharmD
Providence Alaska Medical Center PGY1
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Presenting on Wednesday, May 15 at 8:30 AM in Mission Bay

Objectives:
Antimicrobial stewardship is currently at the forefront of the medical community agenda, and is of utmost importance due to increasing antibiotic resistance and the lack of development of new antibiotics to combat these increasingly resistant organisms. The best way to curb the above mentioned trend is to ensure currently available antimicrobials are being used appropriately. Pharmacists observed that dose and duration of levofloxacin for complicated and uncomplicated UTIs may need improvement. This evaluation was done to quantify the problem and develop an approach for improvement.

Methods:
Information was gathered from PAMC’s electronic health record. An electronic report was generated with the name and medical record number of patients who had an ICD9 code matching one of the aforementioned infections. The charts of forty-two patients who received at least one dose of levofloxacin for treatment of their UTI and had no other documented infections during their admission were examined for dose and duration of levofloxacin therapy. Pertinent lab and microbiology findings relating to diagnosis and treatment of the UTI were also assessed. An analysis was done to determine whether therapy was appropriate with regards to levofloxacin dose and duration, adjustments for renal impairment, possibility for antimicrobial de-escalation, and cost of unwarranted doses to both the patient and the institution.

Results:
This evaluation identified room for improvement regarding levofloxacin use at PAMC. In 64% of cases, an improper duration was used for levofloxacin therapy and in 33% an improper dose was used. Therapy could have been de-escalated in 33% of patients. Currently, staff education via informational flyers and presentations is being completed. A second review using the same methodology as the first will be performed to assess for effectiveness of the actions taken.

Conclusion:
This evaluation confirmed that at PAMC there is an overuse of levofloxacin. By improving the use of levofloxacin, there may be a beneficial effect on susceptibility patterns long-term and costs will be less for the patients and the organization.

ACPE #:0126-9999-13-521-L01-P
Learning Objectives:
- Explain the proper use of levofloxacin in the setting of complicated and uncomplicated urinary tract infections.
- Identify proper alternatives to levofloxacin for de-escalation of therapy in urinary tract infections.


512 - IMPLEMENTATION AND EVALUATION OF A PROCALCITONIN-GUIDED ANTIBIOTIC INTERVENTION IN THE INTENSIVE CARE UNIT TO GUIDE IN THE DE-ESCALATION AND DISCONTINUATION OF ANTIBIOTIC THERAPY

A1. Infectious Disease - Anti-infective Agents

Presented by:

Christopher Smith, PharmD
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Presenting on Wednesday, May 15 at 9:00 AM in Mission Bay

Introduction
Procalcitonin (PCT), an endogenous prohormone to calcitonin, has been shown to have clinical utility as a biomarker for severe systemic and lower-respiratory tract bacterial infections. It is unique over its comparator biomarkers (e.g., CRP, ESR and WBC) in that it is specific to bacteria and has an acute phase reaction profile that mirrors the state of the underlying infection. In research, use of the PCT assay has been shown to lead to reductions in duration of antimicrobial therapy with non-inferior treatment outcomes. The purpose of this study is to implement and evaluate the impact of a PCT–guided antibiotic therapy program in intensive care unit (ICU) patients with severe systemic bacterial infections in a community hospital setting. The objective of this study is to evaluate if the intervention will lead to a decrease in use of antibiotics.

Methodology
This is a non-randomized, prospective study. Patients will be identified both retrospectively (to establish the baseline data) and prospectively (during the PCT-guided antibiotic intervention) for evaluation. Criteria for inclusion are ICU admission, age of at least 18 years and suspicion of systemic bacterial infection. In addition, patients are enrolled in the prospective group when they have received IV antibiotic therapy for less than 24 hours. Data to be collected include: sex, age, diagnosis, microbial culture results for blood, sputum, urine, duration of ICU stay in days, duration of antibiotics in days, PCT levels, recommendations made by pharmacist to physician and recommendations accepted by physician. Education will be provided to the clinical support team (i.e. physicians, nurses and clinical pharmacy) involved in the study. Retrospective patients will be identified from the electronic health record based on ICD-9 codes for sepsis. Pharmacists will identify prospective patients through daily reports of patients receiving IV antimicrobial therapy. If the patient meets criteria for inclusion, the MD will be notified and PCT orders at baseline and every two to three days are encouraged while the patient is on antibiotic therapy. De-escalation or discontinuation of antibiotics will be recommended by pharmacy when overall clinical improvement noted and the PCT concentration is less than 0.5ng/mL or there is at least an 80% reduction from the peak PCT concentration.

Results / Conclusion
Results and conclusion to be discussed.

ACPE #:0126-9999-13-522-L01-P
Learning Objectives:
  Describe the relationship between procalcitonin levels and systemic bacterial infections.
  Describe the role of procalcitonin in antibiotic utilization for patients with systemic bacterial infections.


**513 - RATE OF TREATMENT FAILURE IN HEALTHCARE FACILITY-ASSOCIATED CLOSTRIDIUM DIFFICILE INFECTION**
A1. Infectious Disease - Anti-infective Agents

Presented by:

**Morganne Smyth, PharmD**
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*Presenting on Wednesday, May 15 at 9:30 AM in Mission Bay*

Background: Clostridium difficile infection (CDI) causes a significant burden on the healthcare system, accounting for 15-25% of nosocomial antibiotic-associated diarrhea. CDI may manifest as an asymptomatic infection, mild/moderate diarrhea, and in some patients may lead to fatal cases of pseudomembranous colitis.
The Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA) describe risk stratification criteria for CDI and provide treatment recommendations based on severity of illness in guidelines published in 2010. According to these guidelines, criteria for disease severity are based on two patient laboratory values, white blood cell count and serum creatinine level, and other patient factors including the presence of hypotension or shock, ileus, or megacolon. Specific treatment recommendations are provided based on severity of disease: metronidazole for mild to moderate disease, and oral vancomycin for severe disease. For severe, complicated disease, oral vancomycin plus intravenous metronidazole is recommended, with optional rectal instillation of vancomycin for patients with severe ileus.

Disease severity criteria suggested by the guidelines have not been validated as sole indicators of CDI severity and are based on expert opinion. Many other indicators of disease severity have been suggested in the literature.

The purpose of this retrospective chart review is to determine the rate of treatment failure when 2010 SHEA/IDSA CDI treatment guidelines are followed. To date, treatment success has not been assessed according to guideline recommendations. Our study may help assess whether guideline-based therapy improves patient outcomes. Additionally, this retrospective chart review assesses if additional indicators of treatment failure or recurrence may help predict which patient populations are at greater risk for treatment failure or recurrence.

Methods: This retrospective chart review includes patients with healthcare facility-associated CDI diagnosed between the dates of January 1, 2011 and June 30, 2012. Utilizing electronic medical records, patient information was collected to stratify patients into groups based on CDI disease severity. Treatment regimens prescribed and given to patients were assessed to see if guideline recommended therapy was followed. Patients were also evaluated for treatment failure or recurrence of disease. Patients receiving guideline-based treatment were compared to patients who did not receive guideline-based therapy to assess rates of treatment failure. Additionally, other patient information was collected to compare factors that may contribute to an increase in disease severity, treatment failure, or disease recurrence.

Results and Conclusion: To be presented at Western States Conference.

ACPE #:0126-9999-13-523-L01-P

Learning Objectives:
List the criteria for clostridium difficile disease severity as outlined in the 2010 IDSA/SHEA guidelines. Describe the rate of treatment failure in healthcare facility-associated clostridium difficile infection in patients receiving 2010 IDSA/SHEA guideline recommended treatment versus patients receiving non-guideline based regimens.


514 - OUTCOMES OF INITIATING A COMPREHENSIVE DRUG THERAPY MANAGEMENT SERVICE FOR EMPLOYER-BASED HEALTH INSURANCE BENEFICIARIES

B1. Ambulatory Care

Presented by:

Angie Soken, PharmD
Yakima Valley Memorial Hospital
angiesoken@yvmh.org

Presenting on Wednesday, May 15 at 1:00 PM in Royal I
Introduction:
Several studies have demonstrated the benefits of pharmacist-run comprehensive drug therapy management (CDTM) services in improving health outcomes in patients with certain chronic conditions. The objective of this study is to implement a diabetes focused medication therapy management service for the employees of a community based, non-profit health system and to explore the potential benefits to both the employers and employees.

Methods:
This study was granted exempt status by the local Institutional Review Board. Yakima Valley Memorial Hospital and associated clinic employees with type 2 diabetes were invited to participate in the pilot service using employee specific advertisements. Interested participants were encouraged to contact the pharmacy to arrange for an appointment with a pharmacist.
During the appointment, a pharmacist provided CDTM services. Core CDTM services included; medication therapy review, completion of a personal medication record, development of a medication-related action plan for use in self-management, appropriate interventions or referrals, and documentation in an electronic health record. The patient’s knowledge of their disease state was also assessed using a diabetes knowledge quiz. Incorrect answers were discussed and the patient was educated on any other diabetes or medication-related questions asked. At the end of the appointment, the patient was asked to fill out a satisfaction survey. The pharmacist’s recommendations were faxed to the patient’s primary care provider (PCP) for review along with a request to fill out a provider specific online satisfaction survey. Patients were given a follow up telephone call 2-3 weeks after their appointment to identify any changes in their medication or lifestyle therapies. Outcome data will include the number and type of pharmacist identified therapeutic recommendations, number of pharmacist recommendations implemented, patient and physician satisfaction, and available health plan costs. Results and conclusions will be presented.

ACPE #:0126-9999-13-524-L01-P
Learning Objectives:
- Describe the challenges of implementing a comprehensive drug therapy management service.
- Describe strategies that can be used to implement or improve comprehensive drug therapy management services.


515 - EVALUATION OF VAN AND PIP/TAZO ASSOCIATED NEPHROTOXICITY AS MONOTHERAPY OR COMBINATION USING THE ACUTE KIDNEY NETWORK (AKIN) CRITERIA

A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 10:00 AM in Mission Bay

The objective of this retrospective observational study is to compare the incidence of AKI between patients being treated with the combination therapy of vancomycin and piperacillin/tazobactam and either piperacillin/tazobactam or vancomycin monotherapy using the traditional drug-induced nephrotoxicity criteria
as well as the Acute Kidney Network’s AKIN criteria. The new criteria is defined as an acute reduction in renal function with an absolute increase in SCR of ≥0.3 mg/dL, an increase in SCR of ≥50%, or a reduction in urine output of <0.5 mL/kg/h for >6 hours1,2,3. The rationale of this study is to use the new AKIN criteria to identify patients at risk of developing AKI. Traditionally, the criteria for drug-associated nephrotoxicity are defined as a serum creatinine increase of ≥0.5 mg/dL or a 50% increase in serum creatinine (SCR) from the baseline level or a reduction in creatinine clearance (CrCl) of ≥50% from baseline on two consecutive days1. However, the new criteria proposed by AKIN suggests that even smaller increases in serum creatinine may increase morbidity and mortality, and therefore propose a serum creatinine increase of ≥0.03 mg/dL. It is also speculated that the new criteria will be able to identify more patients at risk of AKI earlier than the traditional drug-induced nephrotoxicity criteria. The implementation of the new AKIN criteria may subsequently alert the physicians and clinical pharmacists to modify current therapy or consider an alternative treatment option if AKIN is suspected. This study will investigate the effects of the combination therapy and the monotherapy of either agent on the change in SCR from baseline, length of hospital stay, and all-cause mortality. The results will be used to evaluate the possible impact of these definitions on the incidence of drug-associated nephrotoxicity as well as their possible role in identifying patients who are higher risk for extended length of stay and/or mortality. Data will be collected from chart reviews of patients who meet the selection criteria for the study. The information that will be gathered includes pertinent demographic, laboratory, and clinical information: age, diagnosis upon admission, baseline comorbidities, indication for piperacillin/tazobactam and/or vancomycin, concomitant medications that potentially can cause nephrotoxicity, hydration status using intakes and outputs and BUN to SCR ratio, length of hospital stay, change in SCR over the course of therapy, BUN, and urine output in mL/kg/hr, vancomycin trough levels, duration of treatment of piperacillin/tazobactam and/or vancomycin, microbiology results, other use of antibiotic therapy, need for renal replacement therapy, renal consultation, and dosage adjustment of other drugs. Baseline renal function (GFR) will be estimated using the MDRD equation, and creatinine clearance will be calculated using the Cockroft-Gault equation.

ACPE #:0126-9999-13-525-L01-P
Learning Objectives:
  - Describe the new AKIN criteria for determining acute kidney injury
  - Explain the clinical application of the new AKIN criteria.


516 - REVIEW OF SEPSIS READMISSIONS FOR POTENTIAL CONTRIBUTING FACTORS AND CATEGORIZATION OF RESULTS

A1. Infectious Disease - Anti-infective Agents

Presented by:

Samantha Spangler, PharmD
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Presenting on Wednesday, May 15 at 10:30 AM in Mission Bay

Introduction: Sepsis accounts for over 26% of thirty-day hospital readmissions, according to 2012 statewide survey results for healthcare quality improvement by the state of California. With the Centers for Medicare and Medicaid Services now imposing penalties on hospitals with high readmission rates, reducing thirty-day hospital readmissions is a priority for both patient safety and cost avoidance. Kaiser Permanente readmission rates are
similar to statewide rates, but reducing readmissions continues to be a priority within our health system. Our study objective was to determine factors that may be associated with an initial readmission diagnosis of sepsis. It was our hypothesis that patients readmitted due to sepsis have contributing factors such as home therapy compliance or infectious disease management issues that could be categorized and analyzed to determine prevalence. Prevalence of associated factors can be used to identify areas for potential pharmacist intervention.

Methods: A retrospective chart review was performed on all patients readmitted with an admission diagnosis of sepsis within thirty days of initial discharge from January 2012-January 2013. Home therapy compliance, antibiotic stewardship, drug therapy selection and chronic disease state management were evaluated for each study participant. Initial discharge medications were assessed for therapeutic appropriateness. Home compliance was assessed based on prescription fill history, documented patient statements and therapeutic levels. Data was then pooled, categorized and analyzed to determine prevalence. The percentage of readmissions due to sepsis with each identified contributing factor was reported.

Results and Conclusion: The results confirmed that the majority of study participants had at least one potential contributing factor, with infectious disease management issues being the most prevalent. Common infectious disease management issues included dosing and therapeutic selection. Lack of compliance with home medical therapy was also commonly noted, with some cases attributed to lack of patient understanding of discharge therapeutic regimen. Prevalence was used to suggest areas for pharmacist intervention. Detailed results and conclusions will be presented.

ACPE #:0126-9999-13-526-L01-P
Learning Objectives:
- Describe the potential factors that may contribute to readmission with a diagnosis of sepsis.
- List the prevalence of identified factors that may be associated with readmission due to sepsis.


517 - AN ANALYSIS OF CONTINGENT THERAPY PROGRAMMING AND ITS IMPACT ON PRIOR AUTHORIZATION VOLUME AND NECESSITY FOR CLINICAL PHARMACIST REVIEW

C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

Amy Speakman, PharmD
American Health Care Managed Care Residency
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**Presenting on Wednesday, May 15 at 2:00 PM in Palm II**

Introduction:
The manual clinical review process is time-consuming and may be a deterrent to a patient’s timely receipt of medications, as ‘authorization’ is required ‘prior’ to claim adjudication. Prior authorizations (PAs) require medical necessity documentation and clinical review by pharmacists for drug coverage approval. Contingent therapy (CT) programming placement allows administration of prescription benefits where automated clinical screening is utilized to determine medication coverage. Medications that require trial and failure of alternative medications for PA approval are the focus of CT programming placement, which may decrease PA volume requiring manual processing and improve turnaround time.

Methodology:
Preliminary Data: CT programming was placed previously on the angiotensin receptor blocker (ARB) class for five of 27 managed client plans. The data from the initial five plans was analyzed, the results of which are presented in this work as a progress report.

Continuation – Research-in-Progress Report: This study involves claims adjudication only. Direct human intervention will not be conducted; therefore, ethics committee approval is not required. Claims data will be collected for the remaining 22 plans six months prior to CT programming placement as a baseline measure. As with the preliminary data, the standard CT criteria will be programmed into the adjudication process to negate the need for clinical pharmacist review.

Post-implementation data will be collected six months after placement of the CT programming. The pre-implementation and post-implementation data will be compared to evaluate the impact on PA volume and average turnaround time for PAs requiring clinical pharmacist review. An additional analysis will be conducted to ensure accurate adjudication of the ARB class under the CT criteria.

Results:
There were 900 approved ARB claims collected from five of 27 clients between April 1, 2011 and February 29, 2012. Of those 900 claims, 818 claims were processed through CT criteria. There were 493 claims (~55%) that processed automatically through CT criteria without the need for clinical pharmacist review or manual processing; 325 claims (~36%) reached the CT criteria step in the adjudication process but still required manual processing for final claims adjudication.

Manual PA processing and clinical pharmacist review was required for 407 claims. There were 82 claims that did not meet CT criteria. There were 325 claims requiring manual processing. Reasons for subsequent manual processing fell into one of three categories: grandfathering, manual reimbursement, or PA extensions. PA extensions encompassed the majority of PAs meeting CT criteria requiring manual processing, with 197 claims (61%).

Conclusion:
Due to the implementation of ARB CT criteria for five of 27 clients, manual processing was no longer required for more than half of approved claims and expansion of ARB CT programming is justified.

In addition, this preliminary data offers support to expanding CT programming to medication classes beyond the ARBs. Prospective medication classes for such expansion include bisphosphonates, triptans, proton pump inhibitors, and statins.

ACPE #:0126-9999-13-527-L01-P
Learning Objectives:
Explain the purpose and goal of contingent therapy (CT) programming with regards to manual processing of claims.
List medication classes that could benefit from placement of CT programming that will serve to decrease the volume of PAs requiring clinical review by a pharmacist.


518 - EARLY POSTOPERATIVE MULTIMODAL ANALGESIA AND THE ROLE OF PARENTERAL ACETAMINOPHEN
A5. Neuro-Psych or Pain Management Agents

Presented by:
Matthew St.Amand, PharmD
Providence Sacred Heart Medical Center and Children's Hospital
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Purpose:
Poor pain management in pediatrics is associated with short and long term morbidity and sequelae. Since 2000, the Joint Commission has required institutions to incorporate pain management practices into institutions’ performance measurement and improvement programs as the Joint Commission regards pain as the “fifth vital sign”. Opioids remain the gold standard of analgesia; however, multimodal analgesia, used in lieu of opiate monotherapy, has been shown to spare narcotic use and may decreases risk of serious adverse events while not sacrificing pain control. At Providence Sacred Heart Children’s Hospital (PSHMC), postoperative analgesia, between PACU and the floor in particular, is being addressed. Parenteral acetaminophen, a new variation of a widely used non-opioid, has advantages in the peri-operative period when the oral route is unavailable and where the rectal route has shown to be unreliable. Adding IV acetaminophen to a postoperative multimodal analgesic routine where scheduled non-narcotic medication may further benefit patient pain management and decrease opiate requirement over the institution’s current use of non-narcotic therapy.

Methods:
A retrospective analysis of surgical patients at PSHMC to collect data including patient pain scores, analgesic therapy, any adverse drug reactions determined or highly suspected to be the result of analgesic therapy, and patient satisfaction scores (if available) was performed to identify deficient areas of pain management. Review of the current PSHMC postoperative analgesia protocols as well as a review of current, published guidelines, recommendations, and standard of care was conducted in order to design a postoperative, non-narcotic analgesia protocol to include the earliest reasonable initiation of analgesia with a defined role for use of parenteral acetaminophen. This protocol was implemented through the Providence Sacred Heart Children’s Hospital Pediatric Service Line for the use in a select population of the pediatric surgical patients. It is the aim of this quality improvement project to improve these metrics as well as collect prospective data on pain scores, opiate use, drug-related adverse effects, and the drug therapy required as intervention for these adverse events.

Results/Conclusions:
Before initiation of the pediatric postoperative non-narcotic protocol, the prescribing of scheduled non-narcotics was present on less than 10 percent of postoperative order sets, the use of “as needed” non-narcotics for pain management was low in comparison to narcotics, pain scores were poorly documented, and patients transitioning from PACU to the floor were at risk for having little analgesic given. Further results and conclusions to be presented.

ACPE #:0126-9999-13-528-L01-P
Learning Objectives:
- Identify appropriate criteria of use for parenteral over oral acetaminophen.
- List three steps to integrate non-narcotic analgesics appropriately into post-operative pediatric pain management strategies.


519 - FRACTURE RISK ASSESSMENT TOOL COMPARISON IN MALE VETERANS
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
INTRODUCTION: Among Americans age 50 years and older, it is estimated that 1 out of 2 women and 1 out of 5 men will incur an osteoporosis related fracture. Fractures and their associated complications are debilitating consequences of osteoporosis that may be preventable with early detection and treatment. Absolute risk assessment is becoming the preferred approach to guiding osteoporosis fracture prevention treatment decisions; however, male fracture risk estimation is problematic due to poor discrimination of some available tools. Using electronic medical records (EMR) to passively collect fracture risk factor data, a Department of Veterans Affairs (VA) researcher developed a tool with good discrimination in males. Other researchers have shown that FRAX has poor discrimination in this population. The VA Sierra Pacific Network (VISN 21) developed an osteoporosis dashboard that assesses patients’ absolute 10-year fracture risk using FRAX and the VA-Absolute Risk Assessment (VA-ARA) tools. The aim of our projects is to compare the sensitivity and specificity of FRAX versus the VA-ARA tools for predicting fracture to improve early identification and treatment of males at high risk.

METHODOLOGY: An osteoporosis clinical informatics tool will be used to identify cases defined as male Veterans age 50-years and older receiving care in VISN 21. Cases will be further defined as male veterans with documented fragility fractures versus controls. Fractures will be identified using ICD-9 codes for fractures of the hip, spine, forearm and proximal humerus, and exclude patients whose fracture co-occurred with a traumatic event. Controls will be matched to cases on (1) age (within 1 year) and (2) most recent outpatient encounter date (within 1 month). An index date will be defined as the date of fracture event in cases and the same date in the matched control. This study will be a retrospective observational epidemiological study utilizing health information obtained from the VISN 21 clinical data warehouse using data that is collected as part of routine medical care. Calculation of FRAX and VA-ARA will be done using patient demographics and all risk factors present prior to the index date, excluding the fracture event. Patients will be classified as “high” or “low” risk as defined by the World Health Organization (WHO) according to the risk score calculated using each tool. Cases will be analyzed separately using 2x2 tables for cases and controls, and differences in sensitivity and specificity will be compared using a two-tailed test of proportions.

RESULTS/CONCLUSION: We anticipate that our results will assist in demonstrating degree of selection discrimination by two fracture risk assessment tools to appropriately identify males at high fracture risk, ultimately improving timely care and intervention in this patient population. Results and conclusions will be presented.

ACPE #:0126-9999-13-529-L01-P

Learning Objectives:
- Describe the odds of being classified as high fracture risk using the VA Absolute Risk Assessment (VA-ARA) tool versus FRAX.
- Explain the sensitivity and specificity of the VA-ARA versus the FRAX ARA tools for identifying fracture.

Presented by:

Theresa Stehmer, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Royal III

Introduction: Contrast-induced nephropathy (CIN) remains one of the most clinically important complications of the use of intravenous (IV) iodinated contrast medium. Many risk factors for the development of CIN have been identified, such as diabetes mellitus and anemia. It has also been well-established that the presence of multiple risk factors additively increases the risk of developing CIN. There have been several attempts to develop a scoring system to stratify and identify patients at risk for developing CIN based on known risk factors. The most well-known scoring system was developed by Mehran et al. and though it takes many common risk factors into consideration, a major limitation is that it does not consider the role of concomitant nephrotoxic agents. The primary objective of the current study is to evaluate the correlation between the development of CIN and the exposure to concomitant nephrotoxic agents. The secondary objectives are to determine the incidence of both CIN and CIN-associated complications.

Methodology: This study will involve a retrospective chart review of all patients meeting inclusion and exclusion criteria between August 2011 and July 2012 at an academic medical center. Inclusion criteria will include: ≥18 years of age, documented receipt of IV iodinated contrast, and admission for at least 48 hours before and 5 days after receipt of IV iodinated contrast. Exclusion criteria will include: significant change in estimated renal function (defined as serum creatinine change of ≥0.3mg/dL AND at least 25%) in the 96 hours prior to receipt of IV iodinated contrast, renal replacement therapy required within 96 hours prior to receipt of IV iodinated contrast, and receipt of IV iodinated contrast within 10 days prior to the index procedure. Concomitant nephrotoxic agents will include nephrotoxic agents that are administered in the 5 days before and 5 days after receipt of IV iodinated contrast. CIN will be defined as the occurrence of any of the following within 5 days after receipt of IV iodinated contrast: an increase in serum creatinine of ≥0.3mg/dL and ≥25% increase from baseline OR an increase in serum creatinine ≥50% from baseline OR a reduction in urine output to ≤0.5mL/kg/hour for at least 6 hours. CIN-associated complications will include any of the following within 7 days after the receipt of IV iodinated contrast: the need for renal replacement therapy, toxicity from any renally eliminated drug, nephrology consult for renal failure, or additional diagnostic work-up for renal failure. Laboratory data, characteristics of IV iodinated contrast used and radiographic procedure performed, concomitant medications, and patient outcomes will be collected and evaluated.

Results: To be presented at the Western States Conference in May 2013.

Conclusions: To be presented at the Western States Conference in May 2013.

ACPE #:0126-9999-13-530-L01-P

Learning Objectives:
- Identify the incidence of contrast-induced nephropathy (CIN) and CIN-associated complications in an adult inpatient population.
- Describe the relationship between the exposure to concomitant nephrotoxic agents and the development of contrast-induced nephropathy (CIN) in an adult inpatient population.

In response to the increasing number of deaths from opioid medication misuse, Washington state law (HB 2826) mandated that as of January 2012 prescribers of opioids long-term (>3 months) must chart specific components relating to using opioid therapy to treat chronic pain. These components include: nature/intensity of pain, impact of pain, medications for pain, risk screening, and discussion of risks and benefits of treatment. HB 2826 also mandates that the prescriber shall receive informed consent from the patients for which they prescribe opioid medications.

Because many of these elements can be addressed in a group setting, Providence Medical Group in Monroe, WA considered a shared medical appointment as a method to document the components of chronic pain treatment, discuss risks and benefits of opioid medications, and obtain informed consent. Unlike traditional office visits, shared medical appointments provide physicians the help of other patients and support staff (eg, the pharmacist). For many patients, group visits reduce the stigma illness through those who are similarly afflicted; this is especially true when managing chronic pain.

The pharmacy residents at Valley View Clinical Pharmacists implemented a shared medical appointment for patients who took opioid medications to treat chronic pain. A document was devolved which is to be completed by the patient prior to the appointment and includes: PHQ4 or PHQ9, pain scale with and without medications, activities of daily living (ADL) scale with and without medications, CAGE AID risk assessment questionnaire, and the option for the patient to request follow-up from a pharmacist regarding medications. The completed document is subsequently collected at the beginning of the appointment and recorded in the patient’s medical record.

Each physician is responsible for identifying and inviting 6-12 of their patients to a shared medical appointment for chronic pain. During the visit the pharmacist gives an educational presentation about opioid medications, then the physician addresses each patient individually to address questions or specific components of chronic pain management. The shared medical appointment is 60 to 90 minutes long and a patient satisfaction survey is given at the conclusion to assess the patient’s satisfaction with the appointment and the knowledge the patient gained about their medications. A similar survey is given to the physicians to assess their satisfaction with the service.

This study will evaluate how a shared medical appointment influenced the care of chronic pain patients by assessing and documenting the PHQ4 or PHQ9 and the pain and ADL scales. The study will appraise provider satisfaction with the service, and assess the economic impact of shared medical appointments.

ACPE #:0126-9999-13-531-L01-P
Learning Objectives:

- Explain the benefits of a shared medical appointment for chronic pain patients on narcotic medications.
- Describe the economic impact of shared medical appointments when they are used to care for patients who have chronic pain and are on narcotic medications.

522 - EVALUATION OF ETANERCEPT REGIMEN RESPONSIVENESS AND SAFETY OUTCOMES IN VETERANS WITH PLAQUE PSORIASIS

B1. Ambulatory Care

Presented by:
Donna Sun, PharmD
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Presenting on Wednesday, May 15 at 2:00 PM in Royal I

Etanercept (Enbrel®), a tumor necrosis factor-alpha (TNF-α) inhibitor, was approved for the indication of moderate to severe plaque psoriasis in 2004. In the VA, etanercept is a non-formulary agent, and patients must be assessed for appropriate use, utilizing the VISN 21 Drug Use Criteria (DUC) at our facility. The approved dosing regimen for chronic plaque psoriasis patients using the DUC is an initial dose of etanercept 50mg subcutaneously twice weekly for three months followed by a maintenance dose of 50mg subcutaneously once weekly which is what is recommended by the FDA and American Academy of Dermatology guidelines. Other acceptable dosing regimens found to be effective include initial doses of 25mg or 50mg once weekly or maintenance doses of 25mg twice weekly. In our facility, we have found a population of patients who are on etanercept 50mg twice weekly for a duration longer than the recommended initial three months. In those patients with a higher dose given for longer periods of time than recommended, we decided to evaluate etanercept therapy responsiveness as well as patient safety and risk of adverse events with etanercept. Etanercept was approved for its plaque psoriasis indication based on studies that had looked at 50mg twice weekly dosing for 12 to 24 weeks; however, a study was published in 2007 using etanercept 50mg twice weekly dosing for 96 weeks that looked at efficacy and safety outcomes. We designed a retrospective chart review of veterans with plaque psoriasis who were followed by Dermatology and prescribed twice weekly etanercept for six months or greater. Our objectives are to (1) determine the frequency of patients started on etanercept 50mg twice weekly for more than three months; (2) determine the incidence of adverse events, specifically for any infection, tuberculosis activation/reactivation, or cancer; (3) compare the baseline profiles of our patients to those in the 2007 study that used similar doses; (4) evaluate our patients' responsiveness to therapy; and (5) assess whether failure on prior therapies may have impacted their etanercept dose. The results and conclusion of this study will be presented at the Western States Conference.

ACPE #:0126-9999-13-532-L01-P
Learning Objectives:
- Describe the population of veterans with plaque psoriasis on prolonged etanercept 50mg twice weekly therapy in this facility.
- Describe clinical implications regarding the 50mg twice weekly dose after evaluating our veterans' responsiveness to etanercept therapy.


523 - DEVELOPMENT OF A NEW PROGRAM, PROACTIVE PANEL SUPPORT (PROPS), AND COMPETENCY-BASED TRAINING IN AN INTEGRATED HEALTH CARE SYSTEM

B1. Ambulatory Care
INTRODUCTION: Primary care providers (PCPs) have large patient panels and need support to reduce the risk of cardiovascular events in the patient population. Several clinical pharmacy services at Kaiser Permanente Northwest (KPNW) have case management programs for cardiovascular risk reduction. They receive patients from referrals and region wide population lists but do not extend to managing each PCP’s entire patient panel. The purpose of this project was to implement a new clinical pharmacy service called Proactive Panel Support (ProPS). The service will be a new approach to cardiovascular risk reduction through additional support for PCPs and management of entire patient panels. The ProPS pharmacists will improve population health with a specific focus on patient engagement, medication adherence, treating to target to improve hypertension and diabetes mellitus type 2, and initiation of drug therapy for cardiovascular risk reduction. A competency-based training program was needed to assess and build competencies of the ProPS pharmacists.

METHODOLOGY: In July 2012, the Kaiser Permanente Northwest Region started Proactive Panel Support, modeled after a similar program at Kaiser Permanente Southern California. The ProPS pharmacists review patients within PCP panels and meet with each PCP and Medical Assistant (MA) dyad team on a monthly basis to review a patient list based on cardiovascular risk factors. Patients are selected for ProPS intervention with the guidance of each PCP. The pharmacists initiate or modify therapy for hypertension, hyperlipidemia, diabetes mellitus type 2, and initiate target cardiovascular risk reduction medications as appropriate. Standardized processes for workflow, documentation, and patient data collection were designed for ProPS. In order to assess baseline knowledge and to ensure competency of ProPS pharmacists, a competency-based training program was designed. The CBT program consists of five different module topics including motivational interviewing, hypertension, hyperlipidemia, diabetes mellitus type 2, and cardiovascular risk reduction medications. The training includes didactic learning, self-study, shadowing experiences, and mentored practical experiences with use of a ProPS training checklist. This project was submitted to the Institutional Review Board and was exempted from a full review.

RESULTS: Eight pharmacists were assessed for baseline competencies for the CBT program. Four ProPS pharmacists passed the competency-based tests and did not require additional training to provide ProPS services. The remaining pharmacists did not complete the training due to competing needs in other areas of work other than ProPS.

CONCLUSION: A new clinical pharmacy service was implemented at KPNW and valuable collaborative relationships between PCPs, MAs, and individual ProPS pharmacists were built. A new model for patient care was created that allows for coordinated and individualized patient care of patients and management of each PCP’s patient panel. Modules for which competencies were met correlated with previous practice experience in other cardiovascular risk management programs. The CBT program will be utilized in the future with new ProPS pharmacists and has been expanded for use by other clinical pharmacy services.

ACPE #:0126-9999-13-533-L04-P
Learning Objectives:
   - Describe population-based care in an integrated healthcare system
   - Describe the components of a competency-based training program for a new clinical pharmacy service

524 - IMPLEMENTATION OF AN OPTIMIZED EMERGENCY MEDICINE PHARMACY SERVICE MODEL IN A FULLY INTEGRATED HMO MEDICAL CENTER

B3. Critical Care

Presented by:

Phraeopnan Suthipinijtham, PharmD
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Presenting on Wednesday, May 15 at 11:00 AM in Executive 713

INTRODUCTION:
In 1999, the Institute of Medicine (IOM) published “To Err is Human: Building a Safer Health System” which has shifted many health care providers to focus their practice on patient safety and the reduction of medication errors. The need for an Emergency Medicine Pharmacist Service Model has been supported in numerous literature studies. These studies demonstrate that the involvement of clinical pharmacists in the Emergency Department (ED) have resulted in safer, and more effective delivery of medication while reducing avoidable medication costs. Past literature also shows that approximately 5% of patients visiting the Emergency Department experienced an adverse event and that 70% of those events were preventable. The American Society of Health-System Pharmacists (ASHP) believes every hospital pharmacy department should provide its Emergency Department with the pharmacy service that is necessary for safe and effective patient care. The unique, fast-paced environment of the Emergency Department poses challenges to ensuring medication safety. Unlike the medication procedures in other healthcare settings, medications in the Emergency Department at Kaiser Panorama City are usually ordered and administered at the point-of-care. One-time medication orders in the Emergency Department are auto-verified and automatically bypass verification by a pharmacist. Kaiser Permanente Panorama City’s clinical pharmacy team recognizes this opportunity to provide its expertise to develop an optimal emergency medicine clinical pharmacy service model that will effectively and efficiently improve medication safety, quality, and cost measures in the Emergency Department. Having a pharmacist in the Emergency Department should help to improve quality and safety by reducing medication-related errors, providing drug information service, reducing total costs, and helping to improve overall healthcare delivery systems.

METHODOLOGY:
This descriptive study involves 1) Evaluating current Emergency Medicine Pharmacy Programs in the Southern California Health Maintenance Organization (HMO) population 2) Performing a retrospective analysis of data extracted from Kaiser Panorama City Emergency Department’s Unusual Occurrence Reports and the Emergency Department Census Report from January 2009 through July 2012 3) Identifying the medication-related gaps in care in Kaiser Permanente Panorama City’s Emergency Department 4) Assessing the needs of the Emergency Medicine pharmacist using a multidisciplinary approach pre and post the two-week prospective study 5) Implementing a pilot study of an optimal Emergency Medicine clinical pharmacist service model at Kaiser Permanente Panorama City Medical Center 6) Developing a description of an optimal emergency medicine pharmacy service model that will address the specific needs of Kaiser Permanente Panorama City’s Emergency Department.

RESULTS: (pending)
Primary outcome is the number of clinical interventions documented by a pharmacist in the Emergency Department
Secondary outcomes are the total cost avoidance measured in the Emergency Department
CONCLUSION: (pending)

ACPE #:0126-9999-13-534-L01-P

Learning Objectives:
- Describe the optimal roles and values of an Emergency Medicine Pharmacist
- Explain the need for an Emergency Medicine pharmacist at Kaiser Permanente Panorama City


525 - A RETROSPECTIVE COHORT STUDY OF READMISSION RATES FOR INDIVIDUALS WHO RECEIVE WARFARIN COUNSELING FROM A PHARMACIST
B4. General Clinical Practice

Presented by:
Chelsea Suzuki, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Royal III

Background:
Pharmacists have made a positive impact in reducing 30-day readmissions through participating in discharge counseling. However, little is known about what impact pharmacists’ counseling can make on reducing anticoagulation-related readmission rates.

Methods:
A single-center, retrospective, cohort study, at The Queen’s Medical Center (QMC), will evaluate 30-day readmission rates between individuals who received warfarin counseling from a pharmacist and individuals who did not receive warfarin counseling from a pharmacist. The primary objective is to test whether pharmacists’ warfarin counseling has an impact on 30-day readmission rates for individuals on warfarin therapy. The study will determine if an association exists between readmission rates and other covariates, which include the following: Adverse drug events, age, gender, race, insurance status, hospital disposition and the number of medications patients are discharged on. A secondary objective is to evaluate patient satisfaction, as determined by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey results, between individuals who receive pharmacist counseling for warfarin therapy and individuals who do not receive pharmacist counseling for warfarin therapy.

Patients will be assessed for an all-cause readmission within 30-days of the index discharge. Inclusion Criteria: 
Adults ≥18 years of age who were discharged from QMC between January 1, 2011 and December 31, 2012.
Exclusion Criteria: Patients who were transferred to another hospital facility upon discharge or had an anticipated readmission to an intermediate care (progressive care unit). Pharmacists counseling includes discussing the purpose of therapy, importance of compliance, monitoring, diet, drug-interactions with prescribed and over the counter medication, bleeding complications and other adverse effects. Adverse-drug related readmissions will be characterized using International Classification of Disease (ICD-9) codes.

Results:
Results and conclusions will be presented.

ACPE #:0126-9999-13-535-L01-P

Learning Objectives:
Describe the impact pharmacists’ warfarin counseling has on 30-day readmissions. Describe associations between readmission rates and other covariates (i.e. adverse drug events, age, gender, race, insurance status, hospital disposition and the number of medications patients are discharged on.)


526 - IMPLEMENTATION AND EVALUATION OF A COMMUNITY PHARMACY ASTHMA AND COPD EDUCATION PROGRAM

B2. Community Practice

Presented by:

Kim Swanson, PharmD
University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences and King Soopers City Market Community Pharmacy Residency
kimberly.swanson@kingsoopers.com

Presenting on Tuesday, May 14 at 3:00 PM in Sunset V

King Soopers City Market, a division of the Kroger Company, operates 143 stores in Colorado and has received recognition for initiatives in community health screenings, pharmacy-based immunization services, and diabetes management. King Soopers City Market has fifteen Pharmacy Care Centers in metropolitan Denver operated by Patient Care Specialist (PCS) Pharmacists who are providing MTM services, smoking cessation education, adolescent and adult immunizations, point-of-care testing, and disease state management to patients with diabetes, hypertension, and dyslipidemia.

The purpose of this project was to design and implement a new Asthma and COPD Education Program at King Soopers City Market and assess patient outcomes.

Phase One: Design and implement a new asthma and COPD education program offered by Patient Care Specialist Pharmacists in the King Soopers Pharmacy Care Centers.

Phase Two: Administer Asthma Control Tests (ACT) to patients picking up inhaled medications indicated for asthma treatment or relief of symptoms in King Soopers community pharmacies, follow-up with patients to explain ACT results, and enroll patients in program if indicated or desired. Additionally, enroll interested asthma and COPD patients in program.

The new Asthma and COPD Education Program consists of a one-hour appointment with a PCS focused on the following learning objectives:
- Asthma or COPD disease process and implications
- Avoiding triggers and recognizing symptoms
- Self-management of symptoms
- Adherence to maintenance medications
- Proper inhaler technique
- Immunization recommendations and administration

Follow-up visits are scheduled as needed.

Phase Three: Quality assurance follow-up of patients enrolled in program to assess the outcomes of symptom control via ACT, adherence to maintenance medication, and immunization status compared to baseline status.

ACPE #:0126-9999-13-536-L01-P

Learning Objectives:
Describe how to implement a community pharmacy asthma and COPD education program.
List the learning objectives of an asthma education session.


**527 - ESTABLISHING A STUDENT PHARMACIST MEDICATION THERAPY MANAGEMENT (MTM) APPE STUDENT ROTATION IN A FAMILY MEDICINE CLINIC**

B1. Ambulatory Care

Presented by:

Patrick Tabon, PharmD
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*Presenting on Wednesday, May 15 at 3:00 PM in Royal I*

Medication therapy management goals are to improve collaboration among pharmacists and other members of the healthcare team, provide quality patient education to improve adherence, and to optimize medication regimens to improve clinical outcomes. There is a growing need for these services, especially in patients with multiple chronic disease states, complex medication regimens, and the elderly population. The purpose of this project was to create an Advanced Pharmacy Practice Experience (APPE) rotation for the Swedish Cherry Hill Family Medicine Clinic focusing on medication therapy management. A rotation syllabus, student training modules based off of disease state management guidelines, and practice patient cases were developed to provide students with the tools needed for effective MTM. Clinic workflow was also evaluated with the medical team to optimize time during a patient’s visit to the clinic. The rotation will be available to students starting in the Fall of 2013. Future prospective data will be taken upon initiation of the rotation to document the value of MTM services (i.e. medication adherence, reaching desired therapeutic goals, avoiding potential drug-drug interactions, and patient cost-savings).

ACPE #:0126-9999-13-537-L01-P

Learning Objectives:
- Describe the benefits of providing pharmacist run medication therapy management for the patient, for the health system, and for the pharmacy profession
- List ways student pharmacists can be utilized in a ambulatory care clinic to provide effective medication therapy management


**528 - A QUALITY IMPROVEMENT MEDICATION UTILIZATION EVALUATION FOR APPROPRIATE AND SAFE STIMULANT USE AT A VA HOSPITAL**

A5. Neuro-Psych or Pain Management Agents

Presented by:
Presenting on Wednesday, May 15 at 8:30 AM in Palm III

1. Introduction:
At the Veteran Affairs Puget Sound Health Care System (VAPSHCS), the Mental Health Psychopharmacology Committee developed guidelines for stimulant use for the Mental Health Service. These guidelines included appropriate indications for stimulant use by Mental Health Service or those better treated by neurology or primary care services, indications rejected by the committee, and general prescribing rules. The objective of this quality improvement project is to analyze the percentage of stimulant use that meets the recommended criteria. Secondary objectives include diagnostic criteria used to prescribe the stimulant, other concurrent Axis I Mental Health conditions, and other condition(s) that a stimulant use may be contraindicated or should be used with caution as described in FDA labeling.

2. Design:
A retrospective, descriptive/observational chart review of veterans who received stimulants from VAPSHCS Seattle Division or Mount Vernon clinic.

3. Methodology
Subjects greater than 18 years old who were prescribed a stimulant at VAPSHCS Seattle Division and Mount Vernon clinic between January 1, 2012 to December 31, 2012 were included in the study. Electronic medical records will be reviewed for patients with a stimulant prescription for age, gender, indication for stimulant, documentation of response, other mental health diagnosis, other medications, vitals, and initial progress note when stimulant was first prescribed.

Primary Outcome: Percentage of stimulant use that meets the recommended criteria of the Mental Health Psychopharmacology Committee guideline for stimulant use in the Mental Health Service.

Secondary Outcomes:
- Diagnostic criteria used to prescribe the stimulant
- Other concurrent Axis I Mental Health diagnosis
- Other condition(s) that a stimulant use may be contraindicated or should be used with caution as described in FDA labeling

4. Results and Conclusion:
Pending findings.

ACPE #: 0126-9999-13-538-L01-P

Learning Objectives:
- Explain appropriate and safe stimulant use
- Describe recommended criteria of the Mental Health Psychopharmacology Committee guideline for stimulant use


529 - CLINICAL OUTCOMES ASSOCIATED WITH PROVIDING PHARMACIST-FACILITATED DISCHARGE SERVICES FOR ETHNICALLY DIVERSE PATIENTS

B4. General Clinical Practice

Presented by:
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**Presenting on Wednesday, May 15 at 5:00 PM in Royal III**

Background: The expanding role of clinical pharmacists in the care of hospitalized patients has been well-documented over the past two decades, with numerous studies evaluating the impact of pharmacists’ participation on medical rounds, medication reconciliation processes, and the provision of drug-specific pharmacist services. According to the 2012 Hospital National Patient Safety Goals (NPSG), the Joint Commission has outlined the importance in obtaining the most up-to-date list of patients’ medications, accurately reconciling their medications, and ensuring that the patient knows what to take upon discharge. In June 2009, the Centers for Medicare and Medicaid Services (CMS) started reporting 30-day readmission measures for acute myocardial infarction, heart failure, and pneumonia on the Hospital Compare website (www.hospitalcompare.hhs.gov). The Affordable Care Act established the Hospital Readmissions Reduction Program that will require CMS to reduce payments to hospitals that have excessive readmissions. Our institution serves a multicultural and aging population that presents many challenges to our healthcare providers. Most of the current medical literature on pharmacist-facilitated discharge services have excluded non-English-speaking patients or did not describe the proportion of non-Caucasian subjects interviewed by clinical pharmacists upon discharge.

Methodology: The primary objectives of this study are to evaluate the impact of the combination of patient discharge counseling with daily rounding on the following outcome measures: (1) 30-day post-discharge readmission rates; (2) 48-72 hours post-discharge rates of obtaining medications; and (3) patient satisfaction. Inclusion criteria for the intervention group include patients who are at least 18 years of age and are admitted to a medical ward team that includes a Pharmacy Resident, Pharmacist, and/or Intern Pharmacist. The control group includes patients as mentioned above but assigned to a medical ward team without a pharmacist. Exclusion criteria include patients who will be discharged to a nursing home or board and care, are discharged over the weekend, are in palliative care or hospice, or have substance abuse or dementia. Upon discharge, the intervention group patients received medication counseling, assistance with discharge medications (delivery at bedside, if possible), and a medication calendar of discharge medications. This group received a follow-up phone call to determine if they picked up their discharge medications, to assess their levels of medication adherence, and to offer additional assistance in regards to having current or future prescriptions filled. The Fisher’s Exact test or Chi-Square test will be used for between group comparisons of readmission rates and rates of obtaining discharge medications within 48 to 72 hours post-discharge. A p-value less than 0.05 will be classified as statistically significant, and descriptive statistics will be used for analyzing other outcomes. The outcomes of this study remain under investigation, with data collection and analysis currently being conducted.

ACPE #:0126-9999-13-539-L01-P

Learning Objectives:

- Describe and identify medication interventions provided by a pharmacist prior to discharge that may prevent adverse events as well as eliminate problems for patients upon obtaining discharge prescriptions.
- Explain how the implementation of a new pharmacist-facilitated discharge service would impact 30-day post-discharge readmission rates, increase medication adherence, and increase patient satisfaction.

530 - EVALUATION OF MEDICATION-USE EXPECTATIONS ON SECONDARY NON-ADHERENCE

B1. Ambulatory Care

Presented by:

Binh Tang, PharmD
Western University of Health and Sciences
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Presenting on Tuesday, May 14 at 2:30 PM in Royal I

BACKGROUND: Medication non-adherence to chronic diseases is a continual concern in the ambulatory care setting. Reports show that approximately 30% of patients exhibit primary non-adherence and 70-75% of patients have secondary medication non-adherence (SMN). SMN is a multifactorial issue that greatly impacts patient morbidity, mortality, and quality of life. SMN is related to many external or internal factors including patient behavior. Previous models of patient health behavior have tried to predict adherence patterns, however none of them have accounted for the role of patient expectations. Our research question is to explore the role of patient medication expectations on adherence, within the framework of the Health Belief Model, which is a widely tested health behavior model.

OBJECTIVE: The aim of this study is to use cognitive interviewing to explore the role of medication use expectations, towards developing an adapted model of health behavior.

METHOD: This is a prospective, multi-center, mix method study. Data collection will occur between January 1, 2013 to March 31, 2013. Patients who consent to the study will participate in an individual, face-to-face interview session in which they will be asked about their experiences and expectations with taking medications. Patients who are asked to participate are English-speaking, at least 18 years of age, have been taking at least one prescription medication for at least six months or longer, and have at least one chronic health condition. Patients who are taking medications for Alzheimer and dementia-related disorders are excluded from the study. Data collection will identify common factors on perceived benefits, perceived barriers, medication-use expectations, and cues to actions as it contributes to medication non-adherence.

RESULTS: The study has obtained IRB approval and data collection and analysis is currently underway.

CONCLUSION: Conclusion is pending, based on the results that are still being collected and analyzed.

ACPE #:0126-9999-13-540-L01-P

Learning Objectives:
- List common factors that may contribute to non-adherence to prescription medications.
- Describe the difference between primary and secondary non-adherence.


531 - A MULTIDISCIPLINARY APPROACH TO REDUCING INAPPROPRIATE PRESCRIBING OF STRESS ULCER PROPHYLAXIS IN ADULT MEDICAL AND SURGICAL INTENSIVE CARE UNITS

B3. Critical Care

Presented by:
Introduction
Overutilization of pharmacological stress ulcer prophylaxis (SUP) in the intensive care unit (ICU) is common. Although acid-suppressing therapies routinely used for SUP are usually well-tolerated, they are best reserved for patients with greatest risk of stress ulcer-related bleeding due to associations with nosocomial pneumonia, Clostridium difficile infections, and increased hospital cost. A multidisciplinary committee was formed with the goal to reduce inappropriate utilization of SUP by 25% in two adult medical and surgical ICU settings by February 2013. Data collected on prescribing practices prior to and after implementation of these interventions will be compared to assess the impact of these interventions in modifying prescribing practices.

Methodology
To attain this goal, we developed an institutional SUP guideline that was approved by the University of California, San Francisco Medical Center P&T committee in December 2012. In addition, we launched an education and awareness campaign and a pharmacist-led intervention to reinforce the intent of our guidelines. To assess the impact of these interventions, data on prescribing practices were collected prior to carrying out the intervention. To assess the impact of computerized physician order entry (CPOE) implementation, which took place in June 2012, pre-intervention data was collected both prior to and after this change. All adult patients in two medical and surgical ICUs were included, with baseline data collected from May 14th through 18th, and 21st through 25th, 2012 then again from September 10th through 14th, and 17th through 21st, 2012. Patients were excluded if they had active upper gastrointestinal bleed, active peptic ulcer disease, gastrectomy, or if they received a solid organ transplant. Additionally, patients receiving dual antiplatelet therapy, concurrent antiplatelet and anticoagulation therapy, or non-enteric coated pancrelipase via gastric feeding tube were also excluded. Data regarding patient age, gender, location, primary service, and indications for stress-ulcer prophylaxis were collected concurrently or retrospectively. Data regarding prescribed acid-suppressing therapies and indications for these therapies prior to admission, during ICU stay and after hospital discharge were also collected.

Post-intervention data collection is currently underway and will include adult patients in two medical and surgical ICUs from February 4th through 8th, and 11th through 15th, 2013.

Results/Conclusion
Pending

ACPE #:0126-9999-13-541-L01-P

Learning Objectives:
1. Identify which patients are at greatest risk for clinically important gastrointestinal bleeding in an ICU setting and are likely to benefit most from stress ulcer prophylaxis (SUP).
2. Describe how multi-component interventions have impacted SUP prescribing practices in adult medical and surgical ICUs at the UCSF Medical Center.

Presented by:

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**Presenting on Wednesday, May 15 at 11:00 AM in Palm III**

Atypical antipsychotic medications are associated with metabolic complications including weight gain, hyperglycemia, new-onset diabetes and dyslipidemia that demonstrate consistent trends across age groups. The established association between metabolic syndrome and cardiovascular disease supports the importance of monitoring and early intervention for patients treated with these medications. However, previous studies indicate a high prevalence of undiagnosed and untreated metabolic disorders in patients receiving psychiatric care in outpatient clinics. As a result of the increased use of atypical antipsychotics for the management of psychiatric disorders within military treatment facilities, additional efforts are required to ensure the highest quality of care for service members that aligns with an evidence-based practice model. The development of a standardized monitoring protocol, implemented by a clinical pharmacist, will allow for early intervention to prevent and manage the adverse effects of atypical antipsychotics. The goal of this process improvement project is to optimize healthcare provider adherence to cardiometabolic monitoring requirements for atypical antipsychotic medications as recommended by expert consensus guidelines developed by the American Diabetes Association and American Psychiatric Association. A standardized report will be created to identify patients who are taking an atypical antipsychotic medication, and a database will be built as a tool to track and prompt follow-up monitoring. To ensure patients receive appropriate follow-up care for any significant laboratory findings identified, a treatment protocol will be developed to provide guidance for standardized clinical interventions. Data will be collected over a six month period to evaluate adherence to recommended cardiometabolic monitoring guidelines and to determine the number and type of interventions made by the clinical pharmacist. Preliminary results and conclusions will be presented.

The views expressed in this abstract are those of the author and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

ACPE #:0126-9999-13-542-L01-P  
Learning Objectives:
- List the cardiometabolic monitoring recommendations for atypical antipsychotic medications.
- Explain how clinical pharmacist interventions can prevent and manage the adverse cardiometabolic effects of atypical antipsychotics.


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**533 - THE CHARACTERIZATION OF TOXICITIES IN PATIENTS WITH ACUTE BUPROPION INGESTION WITHIN A MANAGED CARE SETTING**

A5. Neuro-Psych or Pain Management Agents

Presented by:

**Maribeth Tecson, PharmD**  
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Bupropion is approved for depression and smoking cessation. This medication also has several off label uses. Bupropion overdose can cause an array of neurological toxicities including seizures and/or cardiovascular toxicities such as QTc prolongation. Current bupropion toxicity data is mainly based on information gathered from Poison Control Centers. Poison Control data is limited due to incomplete information since patients are routinely lost to follow-up or medical charts are lacking. Furthermore, most of the published bupropion studies have focused on subjective data. This descriptive study will address limitations of previous publications by focusing on objective data gathered from Emergency Department visits. The retrospective data will be collected within a managed care organization with a fully integrated electronic medical record system, thereby providing complete patient information. Study objectives include: 1) Characterizing the toxicity of acute bupropion ingestion and 2) Determining if different classes of co-ingestants correlate to differences in observed toxicities. Retrospective chart reviews were completed on all patients who presented to a Kaiser Permanente Northern California Emergency Department with accidental or intentional bupropion ingestion from January 2008 through August 2012. Results will be analyzed using descriptive statistics and trend analyses, for example, linear regression. The results of this study will expand the current knowledge of bupropion toxicity and may characterize the effect of co-ingestant drug classes on the toxicity of acute bupropion ingestion. Final results will be presented and discussed.

ACPE #:0126-9999-13-543-L01-P
Learning Objectives:
- Characterize the signs and symptoms of patients presenting with acute bupropion ingestion.
- Determine which classes of co-ingestants augment acute bupropion ingestion.


534 - CLINICAL EXPERIENCE WITH THREE-FACTOR PROTHROMBIN COMPLEX CONCENTRATE (PCC) AT A LARGE, ACADEMIC LEVEL I TRAUMA CENTER
B3. Critical Care

Presented by:
Christine Teng, PharmD
University of California San Diego PGY1 Acute Care Pharmacy Practice Residency
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Presenting on Wednesday, May 15 at 1:00 PM in Executive 713

Introduction:
The purpose of this retrospective analysis is to describe the off-label indications, dosing, efficacy, and safety of three-factor PCC (Profilnine® SD) for the treatment of bleeding or INR reversal at University of California San Diego Health System (UCSDHS), an academic Level I trauma center. Prothrombin complex concentrates (PCCs) are increasingly being used off-label for bleeding or INR reversal associated with vitamin-K antagonists (VKA) use, trauma, or coagulopathy secondary to liver disease. The benefits of PCC over fresh frozen plasma (FFP) include lower infusion volumes to avoid volume overload, quicker preparation and infusion times, and possibly more effective INR reversal. However, the majority of evidence for these off-label indications is based on studies of four-factor PCCs, and current literature on three-factor PCCs, although growing, is still limited. The 2012 American College of Chest Physicians guidelines recommend using
four-factor PCC for VKA reversal, but only three-factor PCCs are currently available in the United States. Many hospitals are using three-factor PCC in addition to Vitamin K, recombinant factor VIIa, and/or FFP in lieu of the four-factor product. An optimal dosing strategy for three-factor PCC in off-label indications has also not been well established. The results of this study may provide further information about PCC efficacy and dosing for these off-label indications.

Methodology:
This is a retrospective chart review of adult patients ≥18 years of age who received at least one dose of three-factor PCC at UCSDHS between February 26, 2011 and December 31, 2012. Exclusion criteria include documented hemophilia, factor deficiency, pregnancy at the time of PCC administration, disseminated intravascular coagulation, and age <18 years old. The primary endpoint of this study will be to evaluate the efficacy of three-factor PCC, as defined by the number of patients who achieve an INR ≤ 1.5 within 24 and 48 hours of PCC administration. The secondary endpoints will report the efficacy of PCC when given at low (approximately 25 units/kg) versus high (approximately 50 units/kg) initial doses, the proportion of patients achieving hemostasis as defined by the physician or cessation of transfusions within 48h, and the occurrence of new thromboembolic complications. This study will also report the off-label indications for which PCC is prescribed at UCSDHS, average hospital length of stay, ICU length of stay, and survival to discharge. The data from this study will be analyzed using appropriate descriptive statistics.

Results and Conclusions:
The results and conclusions will be presented upon completion of data collection and analysis and used to inform future PCC guidelines at UCSDHS.

ACPE #:0126-9999-13-544-L01-P

Learning Objectives:
- Describe the efficacy and safety of three-factor PCC for off-label indications such as bleeding and INR reversal
- Describe the controversy surrounding PCC dosing and effectiveness for INR reversal


535 - EVALUATION OF MECUcation® IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS USING A SELF-REPORTED OUTCOMES SURVEY

B1. Ambulatory Care

Presented by:
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Presenting on Wednesday, May 15 at 4:00 PM in Royal I

Chronic Obstructive Pulmonary Disease (COPD) is a progressive, irreversible disease of the lungs. Current treatments for COPD involve the use of inhaler devices. Each inhaler requires multiple steps, leaving opportunity for errors that can compromise medication delivery. Meducation® is an online medication educational tool that allows patients to watch inhaler-specific demonstrations on the proper use of inhalers in order to maximize its therapeutic outcomes. The primary objective of this study is to evaluate the effectiveness of Meducation® in COPD patients at the VA Long Beach Pulmonary Clinic using the St. George’s Respiratory
Questionnaire (SGRQ) which assesses the patient's perception of health status and quality of life (QOL). The secondary outcomes will include a comparison between pre vs. post Meducation®’s use in patient’s adherence with respiratory medications based on possession ratio, frequency of hospitalizations related to COPD exacerbations, and forced expiratory volume in one second (FEV1). The third outcome will evaluate patient perceived obstacles in using Meducation® through a questionnaire. This is a prospective observational study. The data source will be patients either scheduled for appointment or walk in referrals to the VA Long Beach pulmonary clinic from December 2012-March 2013. Initial and follow-up visits will be assessed through the patient’s medical records. Once it is determined that the patient meets criteria, the patient is eligible to be progressively enrolled in the study. Data extracted on enrolled patients include: SGRQ score, baseline characteristics, current and past COPD medications, recent hospital/COPD exacerbations, and FEV1. Upon the acceptance to be enrolled in the study, the patient will receive a consent form and the SGRQ outcomes survey to be completed at the initial visit. Meducation® consumer medication information sheets and written instructions on how to access Meducation® online video demonstrations specific to patient’s inhalers will be provided to the patient. At the 1-2-month follow-up pulmonary clinic visit, the patient will receive the SGRQ outcomes survey and post Meducation® tool use questionnaire to be completed at the visit. Data that will be extracted at the follow up visit include: date of initial visit, SGRQ score, current COPD medications including medication possession ratio, recent hospital/COPD exacerbation admissions, and FEV1. Statistical analyses such as paired t-test, Chi-square or Fisher’s exact test will be performed for continuous and categorical variables. Pearson’s Correlation will be performed to correlate between clinical outcomes, result of the SGRQ and the validity of the proposed questions regarding the user friendliness and effectiveness of Meducation® as an educational tool. The final results and conclusion will be reported after data collection and analysis have been performed.

ACPE #:0126-9999-13-545-L01-P

Learning Objectives:
- Describe the effectiveness of Meducation® in chronic obstructive pulmonary disease patients using a self-reported outcomes survey.
- List barriers to integrating Meducation® into the VA Long Beach pulmonary clinic and throughout other clinics within the healthcare system.


536 - EFFECT OF DEXMEDETOMIDINE ON DEGREE OF SEDATION AND SEDATIVE USE IN MECHANICALLY-VENTILATED CRITICAL CARE PATIENTS

B3. Critical Care

Presented by:

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Presenting on Wednesday, May 15 at 1:30 PM in Executive 713

The objective of this study is to determine if the use of dexmedetomidine was associated with improved sedation, decreased requirements of other sedatives, and adverse effects in mechanically ventilated patients. Dexmedetomidine is a centrally-acting α2-receptor agonist indicated for the sedation of critically-ill patients. Due to its unique mechanism of action, dexmedetomidine may have advantages over traditional sedatives,
including analgesia, reduced respiratory depression, and easy arousability for neurologic checks. Potential drawbacks include increased cost and adverse effects such as bradycardia and hypotension. In practice, dexmedetomidine is often used as adjunctive therapy in patients who are not meeting sedation goals on traditional sedatives such as propofol and midazolam. Dexmedetomidine is also used to decrease requirements of these other agents to allow for easier ventilator weaning. However, dexmedetomidine is associated with adverse effects such as hypotension and bradycardia, and is only FDA approved for use up to 48 hours.

This retrospective study will evaluate whether the addition of dexmedetomidine improved sedation as measured by RASS scores, whether it allowed for decreased use of other sedatives, whether use continued beyond extubation and/or the approved 48 hour duration, and whether use increased bradycardia or hypotension. All mechanically ventilated patients admitted to the Banner Baywood ICU in 2012 who received dexmedetomidine as adjunctive therapy in addition to other sedatives will be included in the analysis. Their RASS scores, doses of propofol and midazolam, and rates of hypotension and bradycardia will be compared before and after initiation of dexmedetomidine. Patients will also be evaluated on the duration of dexmedetomidine treatment and whether treatment continued after extubation. Results and conclusion to be presented.

ACPE #:0126-9999-13-546-L01-P
Learning Objectives:
- Describe the role of dexmedetomidine in providing sedation to mechanically ventilated patients.
- Explain the effect of dexmedetomidine on patient sedation parameters and utilization of other sedative agents.


537 - EFFECTIVENESS AND SAFETY OF HEPATITIC C TREATMENT WITH BOCEPREVIR IN A VETERAN POPULATION
A1. Infectious Disease - Anti-infective Agents

Presented by:
Anthony Thai, PharmD
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Presenting on Wednesday, May 15 at 11:00 AM in Mission Bay

Introduction: Hepatitis C virus (HCV) can cause an acute or chronic infection of the liver. Patients with acute infections are often asymptomatic and may not know they have the disease until years later. Chronic infection may lead to severe symptoms such as liver decompensation, cirrhosis, or hepatocellular carcinoma. For the past decade, the standard of care for chronic HCV included dual therapy with peginterferon alfa and ribavirin. This combination of drugs has been modestly effective in the treatment of HCV, achieving sustained virologic response (SVR) in 40-50% of genotype 1 patients. In May 2011, the U.S. Food and Drug Administration (FDA) approved new direct acting anti-virals (DAAs), boceprevir (Victrelis®) and telaprevir (Incivek®) for treatment of HCV. Currently, DAAs are recommended with peginterferon alfa and ribavirin as triple therapy for the treatment of genotype 1 chronic HCV. The addition of boceprevir to peginterferon and ribavirin has significantly increased SVR and end of therapy response (ETR) in treatment naïve and previously treated patients. This study is aimed to assess the effectiveness and safety of the addition of boceprevir to peginterferon and ribavirin in Veterans at Phoenix VA Health Care System (PVAHCS).
Objectives: The primary objective of this study is to determine the effectiveness of peginterferon, ribavirin, and boceprevir treatment defined as the percent of Veterans with HCV genotype 1 who have an undetectable viral load at the ETR. Secondary objectives include HCV RNA at 4, 8, 12, 24, 36 weeks, SVR and the number of patients that relapsed after ETR. Incidence of anemia, neutropenia, thrombocytopenia, use of medical treatment for anemia or neutropenia, discontinuation of therapy, and reasons for discontinuation will be used to characterize the safety of HCV triple therapy.

Methods: The assessed group will include Veterans who are 18 years of age or older, diagnosed with HCV genotype 1, started on HCV triple medication treatment (peginterferon, ribavirin, and boceprevir) at PVAHCS on or after 11/1/2011. Veterans will be excluded from the study if they transferred HCV care to a provider outside of the Phoenix VA, transferred HCV care from a non-VA provider to the Phoenix VA, never started on boceprevir treatment, or ETR date is after 11/12/12.

Results and Conclusion: The findings of this study will be presented after completion.

ACPE #:0126-9999-13-547-L01-P
Learning Objectives:
- Describe the role of boceprevir in the treatment of patients with hepatitis C genotype 1.
- Explain the effectiveness and safety of hepatitis C treatment with boceprevir, peginterferon, and ribavirin.


538 - CLINICAL EXPERIENCE WITH TRIPLE THERAPY FOR GENOTYPE 1 CHRONIC HEPATITIS C
A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 11:30 AM in Mission Bay

Introduction:
Patients included in phase III clinical trials are carefully selected and may not be representative of a real world population. Therefore, it is important to assess patient outcomes in routine clinical practice versus those reported in clinical trials to most effectively and safely manage drug therapy. Treatment regimens that have multiple barriers to use such as expense, pill burden, drug interactions, and toxic side effects can make clinical management of these patients complex. The purpose of this study is to describe real world clinical outcomes associated with protease inhibitor-based regimens for the treatment of genotype 1 chronic hepatitis C infection, with a focus on patient demographics and safety, and to improve patient care by better understanding the factors that influence treatment decisions and outcomes.

Methodology:
A retrospective chart review of 128 patients prescribed triple combination therapy for hepatitis C, including boceprevir or telaprevir, was performed at Harborview Medical Center from July 2011 to July 2012. Demographics including race, age, presence or absence of HIV co-infection, prior treatment for hepatitis C virus (HCV) infection, and baseline laboratory markers were evaluated. Major safety assessments included evaluation and treatment required for anemia, thrombocytopenia, leukopenia, skin reactions, psychiatric changes, and any
treatment related side effects requiring emergency care or hospitalization. Efficacy assessments included viral response and cure rates. Demographic, safety, and efficacy outcomes observed in the Harborview patient population will be compared to results extracted from key phase III studies of boceprevir and telaprevir. Results/Conclusion: Results and conclusions of this study will be presented at the upcoming Western States Conference.

ACPE #:0126-9999-13-548-L01-P

Learning Objectives:
Describe the current standard of care for the treatment of genotype 1 chronic hepatitis C infection.
Describe real world clinical outcomes associated with boceprevir and telaprevir based triple therapy regimens.


539 - CLOSTRIDIUM DIFFICILE INFECTION AT AN ACADEMIC MEDICAL CENTER – DEVELOPMENT OF A TREATMENT ALGORITHM
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 1:00 PM in Mission Bay

Choosing between oral vancomycin or metronidazole for the treatment of Clostridium difficile infection has been a controversial topic over the past few years. The Infectious Disease Society of America (IDSA) updated their guidelines for the treatment of CDI in 2010.[1] They recommended oral vancomycin over metronidazole as a first-line agent for the treatment of severe CDI. However, the criteria for severity used in the IDSA guidelines differ from those used in previous literature.[2] The extent to which these recommendations have been adopted in clinical practice, as well as the impact of these recommendations on patient outcomes, has yet to be assessed in the literature.

This study is a retrospective chart review of patients treated at OHSU for hospital-acquired CDI. The Department of Infection Prevention and Control provided patient cases of hospital-acquired CDI, based on criteria for reporting to the National Healthcare Safety Network. The primary investigator collected patient specific data from the electronic health record, including patient and treatment characteristics, pertinent laboratory values, and details of patient disposition when available. The immediate goal of this project is to analyze whether patients were treated appropriately based on the severity of their CDI, and to identify risk factors for the development of CDI. Severity will be classified based on criteria in the IDSA guidelines as well as with the use of a previously published severity scoring tool.1,2 A larger aim of this project is to use the collected and analyzed data to develop an institutional CDI treatment algorithm. Results and conclusions are currently pending.

References:

ACPE #:0126-9999-13-549-L01-P

Learning Objectives:
- Identify potential risk factors for developing Clostridium difficile infection.
- Describe treatment options for patients with Clostridium difficile infection based on disease severity.


540 - IMPLEMENTING A PHARMACIST-RUN ASTHMA CLINIC WITH AN EDUCATION AND MEDICATION MANAGEMENT FOCUS

B1. Ambulatory Care

Presented by:

Teya Tietje, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Royal I

Authors: Teya Tietje, Andrew Davis, Nicole Summerday, Kendra Procacci

Introduction
Asthma is a chronic, reversible obstructive lung disease that affects 25.9 million Americans, with 7.1 million being children under the age of 18. In 2009, nearly 2.1 million emergency room visits were due to asthma-related symptoms. Proper management of asthma is essential to prevent unnecessary morbidity and mortality. Numerous studies have shown that asthmatic patients who receive education and management through non-physician run clinics can have significant improvements in their disease state. Our goal was to implement a pharmacist-run asthma clinic with the objective of comparing patient medication compliance and control of asthma before and after implementation of the clinic.

Methodology
Funding, supplies, and an asthma database were provided through a state grant. Clinic space was made available at an existing ambulatory care clinic. Electronic patient encounter forms were created based on existing forms in the database. Patients are referred by either primary care physicians in the community or emergency department physicians. At the physician’s discretion, the clinic may provide either asthma education and medication management or education only, based on National Institutes of Health asthma management guidelines. Upon each visit, the patient will be assessed for their control of asthma, quality of life, compliance, medication adverse effects, and inhaler technique. Control will be assessed by utilizing a standardized set of questions based on the Asthma Control Test. Quality of life will be assessed by patient report, missed days of work and school, and limitation of normal activities. Compliance will be assessed by patient report, level of control, medication refill history, and number of doses indicated on the inhaler. Patient report will indicate any adverse effects related to medications. At each visit, the patient will be asked to physically demonstrate inhaler technique. Data will be continuously collected for comparison of patient outcomes before and after asthma education and medication optimization. Quarterly reports of outcomes will be forwarded to the State of Montana for research purposes.

Results and Conclusion
In progress
ACPE #:0126-9999-13-550-L01-P
Learning Objectives:
  - Describe the process of implementing a pharmacist-run asthma clinic.
  - List measurable outcomes for evaluating the effectiveness of an asthma education clinic.


541 - EFFECT OF REDUCING PROTON PUMP INHIBITOR USE ON CLOSTRIDIUM DIFFICILE INFECTION IN AN ACUTE CARE HOSPITAL
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 1:30 PM in Mission Bay

Clostridium difficile infection (CDI) is the most common cause of infectious diarrhea in hospitalized patients. Traditional risk factors for CDI include advanced age, antibiotic exposure, immunosuppression, gastrointestinal surgery, and chemotherapy. Within the past few years, proton pump inhibitors (PPIs) have been noted to be a risk factor for development of CDI in several studies. Kaiser Permanente Northern California region has made several targeted interdisciplinary interventions to reduce CDI including removing PPIs from numerous order sets, placing “best practice” alerts on PPI orders, and providing education to the hospital staff. The objective of this study was to develop and implement a pharmacist driven protocol to review existing PPI orders and measure the impact of the PPI targeted interventions on the rate of CDI at a large teaching center within the Kaiser Permanente Northern California system. A retrospective design was utilized to compare the rate of CDI 6 months before and 6 months after the final intervention was implemented. The primary outcome was reduction in CDI. Secondary outcomes included reduction in potentially inappropriate PPI use and percentage of accepted pharmacist interventions. Results of this study are in process.

ACPE #:0126-9999-13-551-L01-P
Learning Objectives:
  - List methods of reducing potentially inappropriate proton pump inhibitor use.
  - Describe the effect of reducing potentially inappropriate proton pump inhibitor use on Clostridium difficile infection.


542 - THE EFFECT OF MEDICATION EVENT MONITORING SYSTEM ON ADHERENCE AND BLOOD PRESSURE
B1. Ambulatory Care

Presented by:
Introduction
Within the Veterans Affairs Palo Alto Health Care System (VAPAHCS) and within the Palo Alto division alone, there are approximately 6,000 patients diagnosed with hypertension. Approximately 40% are uncontrolled with blood pressure > 140/90 mmHg. Medication adherence is essential to successful pharmacotherapy, improved clinical outcomes, and effective utilization of health care resources. However, medication nonadherence remains a common yet unresolved challenge that many patients and health care providers encounter. Many studies have evaluated different methods to measure and improve adherence. Currently within VAPAHCS, adherence is monitored through the Medication Possession Ratio (MPR = days supply dispensed/days between first and last fill). A potential alternative is to measure adherence through the Medication Event Monitoring System (MEMS), an electronic device that records when the medication vial is opened. The use of MEMS is speculated to produce an interventional effect, which may also improve adherence. The primary objective of this project is to determine whether the use of MEMS to monitor adherence in a population of veterans with uncontrolled hypertension is associated with improved adherence and blood pressure control. The secondary objective is to describe adherence as measured by MEMS and MPR.

Methodology
Patients receiving care at VAPAHCS are eligible for inclusion in this project if they are at least 18 years of age, fluent in English, diagnosed with hypertension that is currently uncontrolled, prescribed at least one antihypertensive medication, nonadherent with their antihypertensive medication as indicated by MPR < 80%, willing to use a non-child resistant cap on their medication vial, and able to submit MEMS data monthly. Patients are excluded if they are diagnosed with secondary hypertension, diagnosed with cognitive impairment, receiving care from a non-VA provider, filling their prescription medications from a pharmacy outside of VAPAHCS, reliant on caregiver to administer medications, residing at a long-term care facility, or institutionalized.

MEMS is used to assess dosing adherence, defined as the proportion of days with the correct number of doses taken with respect to the dosing regimen. MEMS is also used to assess timing adherence, defined as the proportion of doses taken within 25% of the dosing interval. Adherence is classified according to the commonly used value of 80%.

Enrolled patients are provided with a medication vial equipped with the MEMS cap and are instructed to take their antihypertensive medication from the vial. Patients are then required to return to clinic monthly so that data from the MEMS cap can be downloaded. During each clinic visit, blood pressure and adverse effects are assessed. Patients are followed for three months. At the end of follow-up, patients will complete a satisfaction survey.

Outcomes include change in adherence and percent adherent both as measured by MPR as well as MEMS. Change in blood pressure and percent at blood pressure goal are also measured. For baseline comparisons of continuous variables, a paired t-test is used to determine statistical significance. Additional outcomes include adverse effects and patient satisfaction.

Results and conclusion will be presented and discussed.

ACPE #:0126-9999-13-552-L01-P
Learning Objectives:
Describe the potential use of MEMS to monitor and to improve adherence.
List outcomes for the use of MEMS to monitor adherence in a population of veterans with uncontrolled hypertension.
The current literature evaluates medication errors from two distinct perspectives: the inpatient/hospital setting and the post discharge/ambulatory care setting. Few studies have analyzed medication discrepancies across the continuum of care defined as the movement of a patient from admission through post-discharge. This study is a two-part series analyzing (1) an ongoing inpatient pharmacy-driven care transitions service and (2) the implementation of a pilot extension of this service in the outpatient setting and its impact on medication related problems (MRP) throughout the entire continuum of care. The first part of this series will be presented.

A single-center descriptive study is being conducted within the University of New Mexico Hospital (UNMH). The study has been submitted and approved by the Institutional Review Board. Data will be collected over 3 phases. Phase 1 provides admission medication reconciliation via patient/caregiver interview, phone reconciliation with the patient’s outpatient pharmacy and the existing medication list from the electronic medical record. Phase 2 provides hospital-to-community-pharmacist handoff consisting of a review of the patient’s discharge medication list for accuracy and a phone call to the patient’s outpatient pharmacy to discontinue medications no longer needed. Phase 3 provides a follow-up phone call after discharge to assess adherence and tolerance and to remind patients to bring all medications to their follow-up appointment. Patients > 18 years of age who speak English or Spanish and are able to provide verbal consent will be included. Patients without an extensive medication history or with a planned readmission will be excluded. Data collected include patient demographics, past medical history, type of MRP, medications correlating to MRP and pharmacy interventions and recommendations. Primary outcomes include describing the type and prevalence of MRP present upon admission to UNMH. Secondary outcomes include most common medication classes associated with MRP and patient-specific predictors of MRP. Data analysis will be conducted using Statistical Package for Social Sciences. Descriptive analyses and logistic regression will be employed. Results will be presented.

ACPE #:0126-9999-13-553-L05-P

Learning Objectives:
- Explain why there is a need for medication reconciliation at each transition of care in an inpatient setting.
- Describe potential pharmacy interventions and/or recommendations to be made during each transition of care during a patient’s hospital stay.
544 - COST-BENEFIT ANALYSIS OF EMPLOYING A SECOND INFUSION SERVICES PHARMACIST FOR MEDICATION THERAPY MANAGEMENT

B4. General Clinical Practice

Presented by:

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Presenting on Wednesday, May 15 at 8:00 AM in Royal IV

INTRODUCTION
Asante Infusion Services (AIS) provides specialized services for patients with intravenous therapy needs. As the demand for infusion services in the community increases, it becomes a challenge for pharmacists to play an active role in clinical services; they have the appropriate knowledge and training but lack time and reimbursement for these services. The primary outcome of this study is to assess the cost benefit of employing a second infusion services pharmacist based on the estimated clinical and billing values of medication therapy management (MTM) services provided. The secondary outcome will assess patient satisfaction surveys.

METHODOLOGY
The data for this institutional review board approved study will be collected from infusion services records for services provided Monday through Friday for a total of four months. Pharmacists and pharmacy residents will provide clinical services and document the interventions via SOAP notes. The frequency of each type of intervention will be recorded. The clinical interventions to be measured include: major and minor adverse drug event prevention; drug interactions; medication education; duplication of therapy; dose adjustments; major and minor drug information consults; pharmacokinetic consults; and new therapy recommendations. A cost-benefit ratio will be calculated using estimated clinical values as well as MTM billing values versus cost of employing a pharmacist. All patient identifiers will be removed prior to data collection.

RESULTS and CONCLUSION
The findings of this study will be presented.

ACPE #:0126-9999-13-554-L01-P
Learning Objectives:
1. Explain the possible cost-benefit of implementing a second pharmacist in the infusion services pharmacy
2. Describe the value of clinical interventions performed by infusion services pharmacists


545 - DEVELOPMENT AND IMPLEMENTATION OF A PHARMACIST-RUN INSULIN OPTIMIZATION CLINIC FOR OUTPATIENT MANAGEMENT

B1. Ambulatory Care

Presented by:

Tu Tran, PharmD
Huntington Memorial Hospital
The ADA/AACE guidelines for management of diabetes have grown more complex due to the additions of new medications and the introduction of new technology. Pharmacists are in a distinctive position where they can provide a unique service for physicians to help manage and optimize these complex medication regimens. The primary objective of this study is to design, attain the necessary approvals and implement a pharmacist run diabetes clinic at Huntington Memorial Hospital. The secondary objectives are to provide comprehensive patient counseling and education regarding insulin therapy and diabetes and to compare baseline A1C vs. 3 months post clinic management A1C to determine the efficacy of the program. The protocol will be designed using the ADA/AACE guidelines for the treatment of diabetes. Initiation and titration of the medications will be designed on the basis of the ADA/AACE recommendations. Prior to the implementation of the clinic, the protocol will be presented at the Pharmacy, Therapeutics and Dietary committee (PT&D) meeting for necessary changes and approval. Once approval has been attained, the clinic will begin enrollment of patients based on referrals from physicians. The team will consist of 3 pharmacists and a pharmacy resident who will be directly involved with patient care. Pharmacists will be able to initiate or titrate insulin per protocol, provide comprehensive diabetes and insulin therapy counseling, and optimize therapy based on ADA/AACE guidelines. Baseline A1C, mean weekly glucose values and 3 months post clinic management A1C will be obtained to determine the efficacy of the program. Results and conclusions will be presented.

ACPE #:0126-9999-13-555-L01-P
Learning Objectives:
- Describe the process involved with development and implementation of a clinic at a community hospital.
- Explain the pharmacist’s role in a insulin optimization clinic for outpatient management


546 - IMPROVEMENT IN CLINICAL PHARMACIST SERVICES AND ASSOCIATED COST SAVINGS IN THE INPATIENT PSYCHIATRIC UNIT
B4. General Clinical Practice

Presented by:
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Presenting on Wednesday, May 15 at 8:30 AM in Royal IV

Introduction
There are many published data on the direct impact of professional pharmacist services in an inpatient psychiatric unit. Currently, minimal pharmacy services are performed in the Providence St. Peter Hospital Inpatient Psychiatry Unit. This study will increase pharmacist-driven patient care activities and attempt to demonstrate the added value of clinical pharmacy services to the inpatient psychiatry unit using pharmacist...
initiated interventions, or iVents. Tracking clinical pharmacist activity will provide a means to compare the current practice to a practice model where pharmacists are established on the unit.

Methods
Pharmacists assigned to the unit will follow a standardized clinical workflow which includes, but is not limited to: patient profile review, medication therapy monitoring and serving as a resource for other members of the healthcare team. A clinical pharmacist intervention will be defined as any action, recommendation, or communication by a pharmacist that is intended to optimize medication therapy and/or minimize risk of adverse effects and results in a change to the management of the patient. Intervention data will be collected and separated into two groups. Group A will serve as a control for the number of pharmacist interventions occurring at present. Group A consists of interventions made for patients present on the psychiatry unit during the months of September and October 2012. Patients will continue to receive the current level of pharmacy services present on the unit. Group B consists of interventions made for patients present on the psychiatry unit from November and December 2012. Group B will receive a dedicated pharmacist providing clinical pharmacy services. Interventions made by pharmacists from November to December 2012 will serve as the treatment arm for comparison to the current pharmacy practice, Group A.

Results and Conclusion
Study results and conclusions will be presented.

ACPE #:0126-9999-13-556-L01-P
Learning Objectives:
- Describe the value of the clinical pharmacist on the inpatient psychiatric unit in regards to cost-savings and improvements in medication related patient care outcomes.
- Describe the critical importance of pharmacist medication profile review and management as a reason to provide clinical pharmacist services in the inpatient psychiatric patient population.


547 - RETROSPECTIVE ANALYSIS OF VTE PROPHYLAXIS IN DOU/ICU PATIENTS WHO RECEIVED ENOXAPARIN
B3. Critical Care

Presented by:
Leah Tribbey, PharmD
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Presenting on Wednesday, May 15 at 2:00 PM in Executive 713

Introduction: The literature shows that VTE leads to significant morbidity and mortality in hospitalized patients, especially in the trauma and DOU/ICU populations. In many cases this leads to increased costs and length of stay. While enoxaparin has been shown to reduce the risk of VTE there is a growing body of literature showing that certain patient populations (obese, trauma, post-op, etc.) are more likely to experience VTE while on standard prophylaxis doses.

The purpose of this study is to determine how effective VTE prophylaxis has been in DOU/ICU patients (with a focus on trauma patients) at Kern Medical Center using standard prophylaxis doses of enoxaparin as compared to enoxaparin doses adjusted based on weight and anti-Xa levels. Adverse drug reactions and possible risk
factors for prophylaxis failure will also be examined. The standardized bleeding definition proposed by BARC (Bleeding Academic Research Consortium) will be used to define and classify bleeding events.

Methodology: Retrospective chart reviews were performed on every ICU/DOU patient >18 years of age who was converted from standard prophylactic doses of enoxaparin (30mg SubQ Q12H or 40mg SubQ Q24H) to either nonstandard prophylactic doses of enoxaparin (doses ≥40mg SubQ Q12H) or full anticoagulation doses of either heparin or enoxaparin between October 1st, 2011 to October 31st, 2012. Patient demographics, height, weight, inpatient medications, PMH, inpatient problem list, SCr, Anti-Xa levels, Hgb/Hct, platelets, ESR, CRP, D-dimer, venous US, spiral CT, and pulmonary angiogram were assessed. Failure of VTE prophylaxis was defined as the development of a clot while on enoxaparin.

Results: In the process of data collection
Conclusion: To be determined based on data analysis

ACPE #:0126-9999-13-557-L01-P
Learning Objectives:
- List factors associated with VTE prophylaxis failure
- Describe the efficacy of standard prophylactic doses of enoxaparin as compared to prophylactic doses adjusted based on weight and Anti-Xa levels


548 - IMPROVING HEART FAILURE MEASURES OUTCOMES: EXPANDING THE ROLE OF TRANSITIONAL CARE PHARMACISTS
B4. General Clinical Practice

Presented by:
Julie Truong, PharmD
Continuum of Care
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Presenting on Wednesday, May 15 at 9:00 AM in Royal IV

Transitional care pharmacists (TCP) ensure continuity of health care by evaluating patients’ medication regimens, providing clinical recommendations, and working with other health care providers to make sure patients can afford their medications. The positive impact of pharmacists in transitions of care have been previously reported. However, studies examining the direct impact of TCP’s on heart failure readmission rates and adherence to Joint Commission Heart Failure (HF) core measures are currently lacking from existing literature. The purpose of this observational study is to 1) determine the effect of a transitional care resident pharmacist (TCRP) on the rate of heart failure readmissions and adherence to Joint Commission HF-1 measure and 2) to qualify and quantify the interventions made by the TCRP from July 2011 – June 2013. This study will prospectively collect data from usual care, provided by the TCRP in heart failure patients, as well as patient demographics. Descriptive analysis will be reported for TCRP interventions. An analyses will be conducted on rates of heart failure retrospectively collected readmission data and adherence to Joint Commission HF-1 measure between July 2009 – June 2011 and be contrasted to the TCRP interventional data. A p-value of <0.05 will be used to indicate a statistical significance. Results and conclusions will be presented.

ACPE #:0126-9999-13-558-L01-P
Learning Objectives:
List transitional care activities performed in and out of hospital settings
Describe heart failure core measure outcomes before and after the implementation of the transitional care resident pharmacist


549 - DOSING OF BASAL-BOLUS INSULIN REGIMENS IN ACUTE CARE GENERAL MEDICINE PATIENTS
A6. Diabetes Care - Diabetes Agents and Devices

Presented by:
Susan Truong, PharmD
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Presenting on Wednesday, May 15 at 5:00 PM in Mission Bay Foyer

Background: Hyperglycemia in hospitalized, non-critically ill patients is associated with poor outcomes including increased length of hospital stay, infection, disability after discharge from hospital, and death. Current guidelines for inpatient hyperglycemia management suggest the use of basal-bolus insulin over sliding-scale insulin therapy. In recent clinical trials, basal-bolus insulin regimens were superior to sliding scale insulin regimens in achieving glycemic goals, and were associated with a lower hypoglycemia risk. Dosing of basal-bolus regimens are weight-based, and can be modified based on patient characteristics. A suggested dosing range for most patients is between 0.4 to 0.5 units of insulin/kg/day. The total daily insulin dose is divided evenly between basal and nutritional insulin. Anecdotal observations, however, suggest that prescribers frequently under dose weight-based basal-bolus dosing regimens due to fear of hypoglycemia. Under dosing may be associated with a lower likelihood of achieving glycemic goal (mean blood glucose ≤ 180 mg/dL).

Objective: To examine the use of basal-bolus insulin regimens in the management of hyperglycemia in patients with type II diabetes at an academic teaching hospital to describe patterns of dosing relative to recommended weight-based dosing.

Methods: This is a retrospective, cohort study including Veterans Affairs (VA) patients hospitalized between January 1, 2010 and December 31, 2011. All diabetic patients who received basal-bolus insulin regimens will be evaluated for inclusion in this study. We will evaluate the difference between prescribed and recommended weight-based basal-bolus insulin. The primary outcome will be to determine the difference between the initial prescribed weight-based insulin dose and the recommended weight-based insulin dose. Secondary outcomes include determining whether the initial dosing of basal-bolus insulin is associated with the likelihood of achieving glycemic goals. Non-parametric correlation analysis and simple linear regression will be used to examine the relationship between body weight and the recommended dose, initial prescribed dose and final insulin dose. Multivariate linear regression will be used to determine the association of initial weight-based insulin dosing on the outcome, mean blood glucose achieved during hospitalization.

Results: Will be presented at Western States Conference.
Conclusions: Will be presented at Western States Conference.

ACPE #:0126-9999-13-559-L01-P
Learning Objectives:
  Explain the importance of inpatient hyperglycemia management.
  Describe an optimal therapeutic regimen to manage inpatient hyperglycemia.
550 - THE SAFETY OF POST-PROCEDURE WARFARIN LOADING DOSES IN PATIENTS RECEIVING LOW-MOLECULAR-WEIGHT HEPARIN BRIDGING THERAPY
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
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Presenting on Wednesday, May 15 at 10:30 AM in Royal V

Introduction:
For patients receiving long-term warfarin therapy undergoing elective invasive procedures, temporary interruption of warfarin therapy prior to the procedure while providing bridging therapy with unfractionated heparin or low-molecular-weight heparin is required to prevent bleeding and thrombotic complications. The 2012 CHEST guidelines from the American College of Chest Physicians recommend resuming warfarin approximately 12 to 24 hours after surgery and when there is adequate hemostasis. However, due to lack of high quality data, the guidelines do not provide dosing recommendations for post-procedure warfarin to safely restore therapeutic international normalized ratios (INR). It is unclear if warfarin should be resumed at patient’s established maintenance dose or with a loading dose. Many practitioners believe bleeding risk can be lowered by minimizing the time of concurrent administration of warfarin and unfractionated heparin or low-molecular-weight heparin post-procedure. As a result, administration of warfarin loading doses for 1 to 3 day(s) post-procedure has become a common practice in order to achieve therapeutic INRs more quickly. This is the current practice at the Anticoagulation Clinic in Kaiser Permanente San Diego and many other Kaiser Permanente service regions, and is tailored to patients’ perioperative bleeding and thromboembolic risks. However, the safety of administering loading doses of warfarin post-procedure has been questioned by clinicians due to the limited data and studies available. The objective of the project was to evaluate the safety of administering post-procedure warfarin loading doses.

Methodology:
This was a retrospective chart review from January 2010 to December 2011. Inclusion criteria included patients managed by the Kaiser Permanente San Diego Anticoagulation Clinic, 18 years old or above, who had been on warfarin therapy for at least 3 months, and received a low-molecular-weight heparin, enoxaparin, bridging therapy for an elective invasive procedure during the study period. Patients who received enoxaparin bridging therapy during warfarin initiation were excluded. The primary endpoint was the rate of major bleeding and thrombosis up to 30 days post-procedure for patients who received post-procedure warfarin loading doses. Definition of major bleeding included the following: hospitalization with a diagnosis of major bleeding, overt gastrointestinal hemorrhage, retroperitoneal, intracranial, or intraocular hemorrhage, bleeding requiring transfusion of 2 or more units of blood, and fatal hemorrhage. Major thrombosis was defined as new deep vein thrombosis or pulmonary embolism, ischemic stroke, thrombophlebitis, arterial occlusion, and fatal thrombosis. The secondary endpoint was the characterization of patients who received post-procedure warfarin loading doses, stratifying based on age, CHADS2 score, nature of procedure, warfarin loading dose in comparison to the established maintenance dose, and hospital admission post-procedure. Both endpoints were reported using descriptive analysis.

Results and conclusions will be presented.
Learning Objectives:

1. Describe the safety of administering post-procedure warfarin loading doses in conjunction with a low-molecular-weight heparin bridge.
2. List factors contributing to the decision of when to administer post-procedure warfarin loading doses.


**551 - IMPACT ANALYSIS OF A COMPREHENSIVE MEDICATION REVIEW PILOT PROGRAM IN A MANAGED CARE SETTING FOR A COMMERCIAL POPULATION**

**B4. General Clinical Practice**

Presented by:

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*Presenting on Wednesday, May 15 at 11:00 AM in Royal IV*

**INTRODUCTION:**
There are limited studies evaluating the benefits of comprehensive medication reviews (CMRs) conducted by pharmacists in the commercial member population. A pilot intervention was implemented by a large health care organization where pharmacists provided CMRs as part of a coordinated care delivery model to a group of commercial members eligible for both pharmacy benefits and case management services. Through close collaboration with nurse case managers and physicians, pharmacists identified medication therapy issues (e.g., drug-drug interactions, drug-disease interactions, duplicate therapies) and aimed to resolve these issues by communicating their findings to members, and notifying their healthcare providers when appropriate.

**OBJECTIVES:**
The objective of this study is to evaluate the value of CMRs conducted by pharmacists by measuring resolution rates for identified medication problems.

**METHODOLOGY:**
This is a retrospective, observational analysis examining the outcomes of a pharmacist conducted comprehensive medication review on a commercial population. Data will be collected from a pharmacist-utilized CMR database and electronic pharmacy claims. Commercial members who are continuously enrolled in the health care organization during the claims review period and have received a CMR conducted by a pharmacist will be included in the analysis. The primary outcome is the resolution rate of medication therapy problems identified by pharmacists during the CMRs. Medication problems will be considered resolved if they meet the resolution criteria established for the specific medication therapy category based on pharmacy claims analysis during the review period 90 days post CMR.

**RESULTS:**
The various types of medication issues found by pharmacists will be reported. Resolution rates will be measured under a defined set of criteria.

**CONCLUSION:**
This study provides insight into the types of medication therapy interventions made by pharmacists in managed care practice and the resolution rates resulting from a CMR program for commercial members. Furthermore, it
may help managed care organizations determine the potential value of allocating pharmacist resources to provide CMRs in the commercial population.

ACPE #:0126-9999-13-561-L01-P

Learning Objectives:
- Describe the top 5 most common types of recommendations made by pharmacists during a CMR for a commercial population.
- Describe the resolution rates for the top 3 drug-related issues identified among the target commercial population.


552 - IMPLEMENTATION OF THE HAS-BLED BLEEDING RISK ASSESSMENT TOOL INTO A PHARMACIST MANAGED WARFARIN PROTOCOL
B4. General Clinical Practice

Presented by:
Crystal Tsui, PharmD
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Presenting on Wednesday, May 15 at 10:00 AM in Royal IV

Introduction: Initiation of warfarin therapy is challenging since the pharmacological response is delayed and difficult to predict. At Highline Medical Center, initial warfarin dosing in the pharmacist managed warfarin protocol is determined by the patient’s bleeding risk. However, there is no validated bleeding risk assessment tool in the literature for hospitalized patients. The HAS-BLED and HEMORRAGHES bleeding risk assessment tools are used for outpatients and are recommended in the CHEST guidelines.

Methodology: A retrospective medication use evaluation (MUE) was conducted on 50 randomly selected patients newly initiated on warfarin between January 2012 and June 2012. The primary objective was to evaluate our current bleeding risk assessment tool compared to HAS-BLED and HEMORRAGHES to determine if areas for improvement related to initial warfarin dosing existed. The number of supratherapeutic INRs, bleeding events and anticoagulation related re-admissions were collected to evaluate safety.

Results: The MUE results showed that our current bleeding risk assessment tool is more conservative than the HAS-BLED and HEMORRAGHES tools and may be overestimating the patient’s bleeding risk leading to initial underdosing. Based on the MUE results, the pharmacist managed warfarin protocol was updated including implementation of the HAS-BLED tool. Post-implementation data collection will be done in a follow up MUE to assess the appropriateness and safety of the new warfarin protocol.

ACPE #:0126-9999-13-562-L01-P

Learning Objectives:
- Describe the factors that need to be considered when initiating warfarin therapy
- Describe how to use the HAS-BLED bleeding risk assessment tool

553 - RETROSPECTIVE EVALUATION OF INTRAVENOUS TEST DOSES TO PREDICT HYPERSENSITIVITY REACTIONS TO OXALIPLATIN

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Tara Tsukamoto, PharmD
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Presenting on Wednesday, May 15 at 3:00 PM in Sunset I

Introduction:
Platinum chemotherapy agents are known to cause hypersensitivity reactions ranging from mild rash to life threatening anaphylaxis. The incidence of hypersensitivity is increased in patients who have received multiple cycles containing a platinum agent, with hypersensitivity occurring in 1% of patients that have received six cycles or less and 27% of patients who have gotten seven or more cycles of carboplatin. A negative intradermal test has been shown to be a reliable predictor that a given patient will not have an allergic reaction to a treatment dose. Hypersensitivity reactions to oxaliplatin were initially reported to be low, but as more patients have been exposed to this agent over the years, hypersensitivity rates as high as 25% have been reported. Like carboplatin, the incidence of hypersensitivity is increased in patients with previous exposure to oxaliplatin. A positive reaction to an intradermal dose of oxaliplatin has been shown to correlate with hypersensitivity to treatment doses of oxaliplatin, but literature is lacking to support intravenous oxaliplatin test doses. At UC Davis Medical Center (UCDMC) and the UC Davis Comprehensive Cancer Center (UCDCCC), patients deemed to be at risk for oxaliplatin hypersensitivity receive an intravenous (as opposed to an intradermal) test dose prior to receiving treatment doses of oxaliplatin. The primary objective of this retrospective study is to evaluate if the practice of using intravenous test doses of oxaliplatin is useful in predicting patient ability to tolerate treatment doses of oxaliplatin at UCDMC and the UCDCCC. Secondary endpoints include incidence and timing of oxaliplatin hypersensitivity and risk of oxaliplatin hypersensitivity in patients with a history of hypersensitivity to carboplatin.

Methods:
This study is a retrospective chart review to be completed at UCDMC and the UCDCCC. Patients that received at least one oxaliplatin test dose followed by an oxaliplatin treatment dose between January 1, 2008 and October 31, 2012 were identified using a list generated from the EPIC electronic medical record system. Data to be collected include information about basic patient demographics, diagnosis, chemotherapy received, and reactions if any to oxaliplatin treatment. For the primary end point, negative predictive value and confidence interval will be calculated. For secondary endpoints, proportions with confidence intervals and descriptive statistics will be used.

Results and Conclusion: Pending

ACPE #:0126-9999-13-563-L01-P
Learning Objectives:
Describe the symptoms of hypersensitivity reactions to oxaliplatin.
List factors that are correlated with increased risk of hypersensitivity to oxaliplatin.

Presenting on Wednesday, May 15 at 2:00 PM in Mission Bay

Purpose:
In 2007, the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) developed guidelines for development of an antimicrobial stewardship program. IDSA/SHEA recognizes that inappropriate antimicrobial use results in increased morbidity, mortality, and cost of health care. Prospective audit of antimicrobial use with subsequent feedback to prescribers has been utilized and shown to be an effective tool in reducing inappropriate antimicrobial use. Limited data exists on ASPs in Native American community hospitals.

Tuba City Regional Health Care Corporation is a 75 bed Native American community hospital on the Navajo reservation in northern Arizona. The goals of the ASP are to reduce the exposure to and utilization of inappropriate antimicrobials, improve quality of care delivered, and cost reduction.

Methods:
Our prospective ASP audit and feedback strategy is being accomplished through pharmacists and with physician collaboration, and was developed using evidence-based guidelines. Stewardship recommendations include: predetermined dose adjustments for renal impairment, IV to PO changes, and optimization, discontinuation, and de-escalation of therapy based on clinical pathways developed from evidence based treatment guidelines. Protocols were developed for each aspect of the ASP program to ensure that all recommendations follow a unified approach. Patient inclusion criteria are: age greater than 17 years admitted to the 33 bed adult care unit and screened by the ASP between December 10, 2012 and May 10, 2013.

Recommendations made by the ASP team will use standardized, non-permanent recommendation forms. These forms will be used to track recommendation approval/disapproval rates. Antibiotic costs and dispensed quantities of all oral and parenteral antibacterial and antifungal agents will be tracked. ASP data for utilization will be followed using the Defined Daily Dose (DDD) per 1000 patient days. ASP data for cost will be tracked using antibiotic cost per patient day (CPPD). The DDD and CPPD for designated pre and post ASP implementation time periods will be compared and used as the primary metrics for efficacy. Approval of ASP recommendations and length of stay will also be utilized as secondary metrics.

Results and Conclusions:
The results of the study will be presented after completion.

ACPE #:0126-9999-13-564-L01-P

Learning Objectives:
- Describe strategies that can be utilized when developing an antimicrobial stewardship program in a community hospital.
- Explain the potential benefits of an antimicrobial stewardship program.

DECREASING THE TREATMENT OF ASYMPTOMATIC BACTERIURIA IN INPATIENTS

A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 2:30 PM in Mission Bay

Background:
Previous studies have shown that despite well-defined guidelines for the treatment of asymptomatic bacteriuria, inappropriate screening and treatment still occurs. The Infectious Diseases Society of America (IDSA) defines asymptomatic bacteriuria as two consecutive urine specimens in women or a single urine specimen in men with a bacterial count ≥10^5 cfu/mL, or one catheterized specimen with ≥10^2 cfu/mL in the absence of symptoms. Symptomatic is defined as having frequency, urgency, dysuria or suprapubic pain. Pyuria identified by urinalysis is not a sole indication to treat. According to these guidelines, the following patients with asymptomatic bacteriuria may be treated: pregnant women and patients prior to transurethral prostate resection and urologic procedures if mucosal bleeding is expected. IDSA suggests that screening and treatment should not be performed on the following patient groups: premenopausal non-pregnant females, diabetic women, older persons living in the community, elderly institutionalized subjects, persons with spinal cord injury, and catheterized patients while the catheter remains in situ. Over-treating asymptomatic bacteriuria may have negative outcomes such as increased antibiotic resistance rates and recurrent urinary tract infections. The purpose of this study is to observe the decrease in treatment of asymptomatic bacteriuria at Exempla Lutheran Medical Center (ELMC) through physician-targeted interventions.

Methods:
This observational study is a retrospective chart review of inpatients at ELMC that had a positive urine culture identified using Vigilanz surveillance software system. Patient charts were examined using our institution’s electronic medical record. The following was collected from culture positive patients: met exclusion criteria, catheter in place, catheter removal if in place, signs and symptoms of urinary tract infection (UTI), treatment, medication, dosage and frequency if treated, and organism. A one month period in June 2012 was examined for baseline data. Data was analyzed and presented to different physician groups through pharmacist-led education. In addition to presenting the data, posters that included a highlight of the asymptomatic bacteriuria recommendations were placed in all physician dictation areas. Email communications were also sent out to all physician groups to reiterate the information. Changes to clinical decision support tools for the treatment of asymptomatic bacteriuria and urinary tract infections is currently being pursued. A follow-up one month chart review will be performed after all interventions are completed to determine if there is any change in the treatment practices of asymptomatic bacteriuria at ELMC.

Results and Conclusion: To be presented at Western States Conference.

Learning Objectives:
Describe which patients should receive screening and subsequent treatment for bacteriuria based on symptoms, catheter use and medical history as defined by IDSA guidelines for asymptomatic bacteriuria.
Explain different approaches to decrease the treatment of asymptomatic bacteriuria

Development of a Patient Assistance Program Within the Cancer Center for Uninsured Patients at a Non-Profit Hospital

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

Ann Upshaw, PharmD
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Presenting on Wednesday, May 15 at 2:30 PM in Sunset IV

Introduction:
Yuma Regional Medical Center’s cancer center has seen an increased population of patients, including the uninsured, leading to a surge in administration fees and high-cost medications. This has subsequently led to increased costs in medical care for both the patient and hospital and occasional delay in treatment for the patient. Development of a patient assistance program (PAP) within the cancer center is expected to increase access to care, improve health outcomes, and reduce charity dollars. Patient assistance programs are often underutilized due to the large amount of time and coordination spent to obtain significant savings, the vast array of programs, and the financial requirements. The objective of this analysis is to develop an organized program to reduce preventable costs associated with oncologic care for both patients and the hospital while expanding the program to ensure inclusion of any patient who may qualify for financial assistance.

Methods:
An initial assessment of the current patient assistance inventory at the cancer center will be conducted and recorded in order to establish a baseline assessment of current savings through the use of the PAP program currently in use. A monthly cost analysis will be performed from January 1, 2013 to April 30, 2013 to assess the benefit of the implemented PAP program. Extrapolated, future savings will be examined once the monthly cost analysis is established to estimate potential prospective savings with an expected increased patient load. Through a collaborative effort of the different departments directly associated with the patient assistance program within the cancer center (financial, nursing, and pharmacy), initial meetings were held to establish specific job descriptions and responsibilities of each person involved with the program to drive better coordination of care. Subsequently, a commonly accessible computer folder was created to allow for accessibility to all documents related to the PAP within the cancer center. An electronic tracking system was created within the pharmacy department to log PAP medications for each patient when drugs are received or if a patient’s medication supply is needed. Through this tracking program, an accurate supply of PAP medications is established for each patient and delay in drug treatment is prevented. Within the billing department, the information technology department was consulted to create drug codes to label patient assistance medications as “free” in order to correctly bill within the computer system.

Results:
The findings of this study will be presented after completion.

Conclusion:
The findings of this study will be presented after completion.

Learning Objectives:
- Describe the process of implementing a patient assistance program
- Explain the potential cost savings within high dollar medications
557 - EVALUATION OF BLEEDING COMPLICATIONS IN ROBOTIC CABG PERFORMED IN PATIENTS ON VERSUS OFF P2Y12 THERAPY
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
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Presenting on Wednesday, May 15 at 11:00 AM in Royal V

Robotic coronary artery bypass graft (rCABG) surgery is a fully endoscopic way of performing CABG which is demonstrating encouragingly low rates of major morbidity and mortality, is cheaper than traditional CABG, and results in shorter hospital stays. Some evidence exists that patients undergoing rCABG may experience considerably lower blood transfusion needs than those getting traditional CABG.

P2Y12 platelet inhibitors play a significant role in the management of acute coronary syndromes (ACS). The large randomized CURE trial demonstrated the benefit of clopidogrel in lowering the risk of myocardial infarction (MI) and the combined endpoint of MI, cardiovascular (CV) death, and stroke in a population of patients with non-ST elevation acute coronary syndromes (NSTE-ACS). The benefit of P2Y12 antagonists must be balanced with the increased risk of bleeding associated with their use. AHA guidelines for CABG surgery recommend discontinuing clopidogrel at least 5 days prior to a CABG procedure. Yet, according to US-based studies, many patients undergoing open chest CABG surgery receive their last clopidogrel dose within 5 days of it.

Literature on bleeding complications of rCABG surgeries performed in patients in whom a P2Y12 platelet inhibitor was not held long enough to eliminate from the body before the surgery is lacking. This project seeks to examine bleeding-related outcomes of patients 18 years and older in whom rCABG was performed on versus off P2Y12 therapy at University of Arizona Medical Center. Retrospective data collection and review were performed on all patients using a hospital electronic medical record and data previously submitted to a national quality improvement database. The primary outcomes were a composite endpoint of TIMI major and minor bleeding and chest tube output over the 3 days post rCABG. Secondary outcomes included mortality within 30 days after rCABG, occurrence of cardiovascular death, nonfatal MI, or nonfatal stroke within 30 days after rCABG, incidence of surgical revascularization due to bleeding, amount of blood products used intraoperatively and postoperatively, and a comparison of the incidence of the primary outcomes in early (first half of patient sample) vs. later rCABG surgeries (second half of patient sample).

Results and conclusions will be presented.

ACPE #:0126-9999-13-567-L01-P
Learning Objectives:
- Describe the incidence of rCABG surgery performed at University of Arizona Medical Center on vs. off a P2Y12 inhibitor
- Describe bleeding-related outcomes of patients undergoing rCABG at the University of Arizona Medical Center on vs. off P2Y12 inhibitor therapy

558 - EVALUATING PHARMACISTS’ SUCCESS IN REPLACING THE LONG-TERM USE OF COLCHICINE WITH URATE-LOWERING MEDICATION AS GOUT MONOTHERAPY.
B1. Ambulatory Care

Presented by:
Kelly Valine, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Palm III

Introduction:
Gout is a common rheumatic disease of adulthood, affecting approximately 3.9% of the US adult population (8.3 million individuals). The prevalence of gout has risen in the US over the last few decades most likely due to an increase in comorbid disease states that promote hyperuricemia, including hypertension, obesity, metabolic syndrome, type 2 diabetes mellitus, and chronic kidney disease (CKD). Other factors that may contribute to the increasing prevalence of gout in the US are dietary trends and the increased use of medications that can increase uric acid, such as diuretics. The etiology of an acute gout flare is due to elevated uric acid levels, which leads to the formation and deposition of monosodium urate crystals within the joints, causing a rapid onset of swelling, erythema, and severe pain. Both the European League Against Rheumatism Guidelines (EULAR) and the American College of Rheumatology Guidelines recommend to reduce and maintain the serum uric acid ≤ 6 mg/dL with urate-lowering therapy in patients with ≥ 2 acute attacks per year. Colchicine is an oral medication that has been used for decades in the treatment of gout by suppressing the inflammatory response. Although it has no effect on the serum uric acid level and is not approved by the Food and Drug Administration for long-term treatment, many patients are taking colchicine regularly for chronic gout treatment.

Methodology:
The goal of this retrospective study is to evaluate the effectiveness of pharmacists at Kaiser Permanente Napa-Solano in replacing colchicine with urate-lowering therapy for the chronic treatment of gout. Pharmacists collaborated with physicians under protocol in the initiation and titration of urate-lowering therapy to achieve a serum uric acid goal of ≤6 mg/dL in patients using > 200 tablets of colchicine in the previous year. The pharmacist contacted each patient by telephone to determine if the patient was appropriate for initiation of urate-lowering therapy or titration if already taking urate-lowering therapy. The patient received education on dietary and lifestyle factors that can affect gout symptoms. In addition, patients were educated on the indication for the medications, proper administration, possible adverse reactions, and appropriate steps to be taken when experiencing a gout flare. Patients were required to return for lab work 4 weeks after initiation and each titration to allow the pharmacist to assess the need for further intervention. Once the uric acid level goal is maintained for 4-6 months, daily use of colchicine could be discontinued and used only as needed for acute gout flares. The primary endpoint of this study is to determine the percentage of patients who will achieve a serum uric acid goal of ≤6 mg/dL after initiation and/or titration of urate-lowering therapy. The secondary endpoints are to evaluate uric acid levels prior to and after establishment of urate-lowering therapy, determine the number of acute gout flares experienced after initiation/titration, identify obstacles to reaching the uric acid goal, and evaluate the projected cost savings to the health care system.

Final results and conclusions:
Will be presented

ACPE #:0126-9999-13-568-L01-P
Learning Objectives:
Describe the results of a pharmacy gout protocol designed to improve patient treatment regimens.
Describe obstacles in the initiation/titration of urate-lowering therapy.


559 - DEVELOP, IMPLEMENT, AND EVALUATE A PHARMACY DASHBOARD: A TOOL MADE FOR THE FRONTLINE
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:
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Presenting on Wednesday, May 15 at 3:00 PM in Palm II

The concept of management information dashboards have been around since the 1970’s. They have the ability to display metrics and key indicators using real-time data, which are compiled into an organized, easy to comprehend format that has helped improve efficiency for many businesses today. This concept has slowly transitioned into healthcare. Dashboards have initially been adopted by the healthcare community as a scorecard to monitor safety, operational processes, medication use in the hospital, medication cost, patient volume, and specific disease states. The information was a retrospective look for management; however, it was not as helpful for the frontline staff, such as a pharmacist or pharmacy technician. The objective of this study is to develop an easy to read dashboard that will help engage the pharmacist and pharmacy technician through key identifiers regarding safety, efficiency, and cost. The goal is to encourage staff to identify areas in the process that can be changed to help them be more effective. Ultimately, these improvements will hopefully translate into improved patient quality and safety.

For the project, meetings will be conducted to determine the most relevant data for both pharmacists and pharmacy technicians separately. A baseline survey of pharmacists and pharmacy technicians will be collected prior to launch of the dashboard. Software will be evaluated for applicable use in this project. Data will be collected and presented as an easy to read electronic dashboard in a highly visible location. Overall, the information presented will raise awareness of the key processes and hopefully identify areas in pharmacy that can be changed to help staff be more effective. The staff will be surveyed at the end of the study and that information will be evaluated to determine the effectiveness of the dashboard. No institutional review board approval was required for this project as its scope is limited to interdepartmental education and evaluation.

ACPE #:0126-9999-13-569-L04-P
Learning Objectives:
1. List key indicators that will engage the pharmacy staff at TMC.
2. Explain how a dashboard will help improve patient quality and/or pharmacy services.


560 - EVALUATION OF INTENSIFIED ALCOHOL WITHDRAWAL TREATMENT IN INTERNAL MEDICINE PATIENTS WHO FAIL THE STANDARD PROTOCOL
A5. Neuro-Psych or Pain Management Agents
Presented by:

Amber VanDuyn, PharmD
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Presenting on Wednesday, May 15 at 2:30 PM in Palm III

Purpose. The current intensified alcohol withdrawal treatment practices at a tertiary care teaching hospital are described and evaluated in order to propose a revised protocol to better serve patients at risk for severe alcohol withdrawal.

Methods. A retrospective chart review of patients who received higher doses of benzodiazepines for alcohol withdrawal than prescribed by the current protocol was conducted at Harborview Medical Center (HMC). Dispensing records of patients who received at least one dose of phenobarbital 130 mg intravenously, the dose prescribed by the current protocol for severe alcohol withdrawal, while on an internal medicine service between January 2008 and August 2012 were obtained for screening. Subjects were identified from this list by manual screening of the electronic medication administration record (eMAR) for off-protocol benzodiazepine dosing. Key data gathered included maximum and total doses of benzodiazepines received, total symptom-triggered doses vs. scheduled doses, time from first CIWA score greater than 25 to prescription of benzodiazepines off-protocol, length of stay, occurrence of delirium tremens, ICU admission, respiratory depression, and delirium. Descriptive statistics were used to evaluate all data points. In addition, a request for other institutional alcohol withdrawal protocols was sent in a survey to 50 university hospitals nationwide. Attributes of the protocols including assessment mechanism and frequency, benzodiazepine dosing, and definition and treatment of severe alcohol withdrawal were compared and analyzed using descriptive statistics.

Results. To be presented.

Conclusion. To be presented.

ACPE #:0126-9999-13-570-L01-P

Learning Objectives:
1. Summarize the different pharmacologic strategies providers may use to safely and effectively intensify treatment of alcohol withdrawal
2. Describe the various alcohol withdrawal assessment and treatment approaches commonly utilized at university hospital institutions


561 - EVALUATION OF A PAIN MANAGEMENT TOOL WITHIN THE VETERANS SIERRA PACIFIC NETWORK (VISN 21)
A5. Neuro-Psych or Pain Management Agents

Presented by:

Vanessa Vaupel, PharmD
VISN 21 Pharmacoeconomics and Managed Care
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Presenting on Wednesday, May 15 at 2:00 PM in Palm III
Introduction:
The objective of this project is to enhance an existing Pain Management tool and determine which patient and medication-based factors are associated with high-dose opioid prescribing. The Clinical Practice Guidelines for the Management of Opioid Therapy for Chronic Pain implemented in the Veterans Health Administration (VA) advises a structured, goal-directed treatment approach for patients receiving chronic opioid therapy for pain management. A Clinical Pain Report available to VA providers in California, Nevada and Hawaii identifies patients using chronic opioids (defined as 90 or more days supply in a 120 day period) in various dose categories. This project incorporates several patient and medication-based variables, such as pain diagnosis, mental health co-morbidities, and opioid use patterns, into an existing chronic opioid use report. A regression analysis will be performed to determine the association between these patient and medication factors and opioid equivalent dose in an effort to determine which factor(s) correlate to high-dose (≥ 120 mg of morphine equivalents/day) opioid prescribing.

Current literature suggests a high percentage of veterans are susceptible to experiencing severe adverse effects such as overdose, motor vehicle accidents, and death with the chronic high-dose opioid use. This project aims to identify which patient and medication-based factors correlate most with high-dose opioid prescribing. This information will enable prescribers to better assess and modify opioid therapy in new-start chronic pain patients, contributing to improved care quality within VA health care system.

Methodology:
Integrate additional patient and medication-based risk factors into the existing Clinical Pain Report.
Utilize the Pain Management Dashboard to identify currently enrolled VISN 21 patients treated for chronic pain with opioid medications.
Determine if a correlation exists between several medication or patient-based factors and opioid dose.
Educate providers on factors that predict future high-dose opioid use, so that changes in pain management approach may be considered to address potentially modifiable risk factors.

Results: Dashboard tool and identified patient and medication-based variables will be presented.
Conclusions: Will be presented at 2013 Western States Conference

ACPE #:0126-9999-13-571-L01-P
Learning Objectives:
(1)Identify common patient and medication factors associated with escalation to high dose opioid therapy in the VA population.
(1)Discuss how a step-wise pain management approach can be applied to chronic opioid users associated with pertinent patient and medication characteristics.


562 - HEPARIN INFUSIONS: TRANSITIONING FROM APTT TO ANTI-XA MONITORING
B4. General Clinical Practice

Presented by:

Nicole Vettese, PharmD
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Presenting on Wednesday, May 15 at 10:30 AM in Royal IV
Intravenous (IV) unfractionated heparin (UFH) continues to play an important role in anticoagulation in the hospital despite the availability of alternative agents. Although the antifactor Xa (anti-Xa) heparin assay may be a more effective method for adjusting heparin doses, St. Joseph Medical Center (SJMC) continues to use activated partial thromboplastin time (aPTT) to adjust IV UFH. Other institutions have previously shown that anti-Xa based adjustment of heparin leads to more expedient therapeutic anticoagulation, longer maintenance of therapeutic levels, fewer laboratory tests, fewer dosage adjustments, and an overall decrease in cost. For these reasons, SJMC revised the UFH continuous infusion protocol to monitor with anti-Xa rather than aPTT. The goal of this project is to coordinate the transition to anti-Xa and analyze the effectiveness of this change. Nursing, physician, pharmacy, and ancillary staff education was implemented in order to facilitate a smooth transition. Primary objectives are to assess the impact of this switch based on percentage of patients with therapeutic levels within 24 hours, number of tests per day, average time to therapeutic anticoagulation and cost analysis. Data will be collected retrospectively for 150 patients prior to implementation and for 150 patients after implementation of the new protocol. This will include a one month washout period following implementation. All adult patients on SJMC’s full dose heparin protocol for greater than 24 hours of uninterrupted therapy were included in this study. Results of preliminary study and anticipated outcomes of the study will be presented.

ACPE #:0126-9999-13-572-L01-P
Learning Objectives:
   Describe the educational process involved in transitioning from aPTT to anti-Xa monitoring of heparin.
   Explain the clinical and economic effectiveness of switching from aPTT to anti-Xa for monitoring heparin.


563 - COMPARING PHYSICIAN ORDER-SETS FOR THE MANAGEMENT OF ALCOHOL WITHDRAWAL IN A COMMUNITY HOSPITAL INTENSIVE CARE UNIT
B3. Critical Care

Presented by:
Ruben Villanueva, PharmD
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Presenting on Wednesday, May 15 at 2:30 PM in Executive 713

Introduction: Although there are different approaches to the management of alcohol withdrawal, at The Medical Center of Aurora an order-set has previously been utilized with benzodiazepine options for either fixed-dosing (clorazepate) or symptom-triggered dosing (lorazepam) depending on physician preference. This order-set was used hospital-wide, including the ICU. The intensivist group at The Medical Center of Aurora has recently created an ICU specific order-set, which includes a more aggressive loading-dose strategy, and it will be compared to the previously used hospital-wide order-set. Previous studies have found symptom triggered dosing to be as efficacious as fixed dosing while significantly reducing both treatment duration and total amount of benzodiazepine administered. Furthermore, a recent trial comparing a loading-dose protocol to a symptom-triggered protocol found no difference in the rate of change in CIWA-Ar or total benzodiazepine dose. Although it did not reach statistical significance, the trend favored the loading-dose group. The authors also reported a higher percentage of patients in the loading-dose group were free of withdrawal symptoms at 72 hours after the initiation of treatment, but this also did not reach statistical significance. It must be noted that the authors
reported a reduced power for their study. Methods: Data will be gathered on patients with an ICD-9 diagnosis of alcohol withdrawal who were placed on the previous order-set from April 2011 through October 2012. In a retrospective fashion, ICU patients treated with the hospital-wide order-set will be compared to ICU patients treated with the current ICU specific order-set. Data collection will occur from January 2013 – April 2013, after all patients have been discharged and data is available via Meditech® or chart review. Admission histories, progress notes, medication records, and discharge summaries will be reviewed to select patients meeting inclusion criteria. Outcomes to be assessed include the primary outcome of ICU length of stay, and secondary outcomes of cumulative benzodiazepine dose, mean daily benzodiazepine dose, hospital length of stay, and adjunctive medication use with corresponding benzodiazepine dose. Patients will also be stratified by liver dysfunction (INR ≥2, INR <2 but ≥1.5, INR<1.5) and admitting diagnosis. Results: Data will be analyzed in April 2013, and will be presented to the medical and pharmacy staff at The Medical Center of Aurora as well as the Western States Conference. Conclusions: We are hoping to add to the body of literature regarding the optimal dosing strategy for the management of acute alcohol withdrawal in an ICU setting.

ACPE #:0126-9999-13-573-L01-P

Learning Objectives:
- List the various benzodiazepine dosing strategies for the treatment of alcohol withdrawal syndrome (AWDS).
- Describe possible advantages of an aggressive benzodiazepine loading-dose strategy for alcohol withdrawal patients in an ICU setting.


564 - DEVELOPMENT OF A PROFICIENCY FRAMEWORK AND MODULE FOR MAJOR DEPRESSIVE DISORDER FOR PRIMARY CARE PHARMACISTS

C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:

**Maria Vincic, PharmD**

Providence Medical Group PGY2 Ambulatory Care Pharmacy Residency

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*Presenting on Wednesday, May 15 at 3:00 PM in Sunset IV*

Introduction: As a pharmacy practice continues to evolve, development of pharmacist competencies and development of further proficiencies for clinical pharmacists have been identified as an important field of future growth. Lack of standardization and significant variability in the processes that establish and evaluate competencies and proficiencies at various levels of pharmacy practice have been identified as impeding factors for successful implementation. Our project sought to develop a standardized proficiency framework which can be applicable not only to the ambulatory pharmacist setting but can evolve to encompass various levels of pharmacy practice and is a first step in standardizing the processes for future competencies and proficiencies. Objective(s): The primary outcomes of this project were to 1) to Explain development a framework for proficiencies that can be applied to various primary care disease states encountered by primary care pharmacists and 2) Describe implementation process of a proficiency module for major depression.

Methods: Development of a proficiency framework was started by creating a scope of work document that specified the differences between competencies and proficiencies, defined the purpose of the proficiency framework and the structure of proficiency modules. Once this work was completed, a survey to assess core
concepts that should be included in a depression proficiency module was distributed to clinical pharmacy specialists practicing in primary care. Ten core subject areas were defined to be either “very useful” or “somewhat useful” in assessing proficiency of the primary care specialist in major depressive disorder. Based on these survey results, a written proficiency assessment consisting of short patient case scenarios and short answer questions was created. This proficiency module will be administered to the primary care clinical pharmacy specialists. Once completed, assessments will be evaluated and scored based on a standardized scoring tool (to be developed). Knowledge gaps will be identified and further modules will be developed and administered based on success of the initial tool.

Results and Conclusion: To be presented

ACPE #:0126-9999-13-574-L01-P

Learning Objectives:
1) Discuss the major differences between “competencies” and “proficiencies” that applies to specific clinical pharmacy settings, i.e. ambulatory pharmacy
2) Explain benefits of the “framework” in development, implementation and standardization of future proficiency modules


565 - EVALUATION OF THE IMPACT OF CONCOMITANT VANCOMYCIN AND IODINATED CONTRAST ON INCIDENCE OF CONTRAST-INDUCED NEPHROPATHY.

B4. General Clinical Practice

Presented by:

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Presenting on Wednesday, May 15 at 9:30 AM in Royal IV

Introduction:
Various contrast agents are widely used in radiographic imaging procedures. The use of intravenous (IV) iodinated contrast in particular, has been associated with a significant incidence of renal injury, thereby termed contrast-induced nephropathy (CIN). Many risk factors for CIN have been described, including hypotension, anemia, and diabetes mellitus. Subsequently, numerous scoring systems have been developed to assess the risk of CIN. The most commonly used scoring system, the Mehran score, does not account for any medications as potential risk factors. Indeed, very few studies have assessed the impact of nephrotoxic medications on the incidence of CIN. The majority of such studies included aminoglycosides, non-steroidal anti-inflammatory drugs, and metformin. No well-designed clinical studies have investigated the potential of vancomycin, a known nephrotoxic agent, to increase the risk of CIN. The purpose of this retrospective study is to evaluate the risk of CIN in patients who are, and are not, receiving concomitant IV vancomycin. Based on our findings, the results may have implications for more aggressive therapeutic drug monitoring in patients after receipt of IV iodinated contrast.

Methodology:
This will be a retrospective, descriptive, single-center, cohort study of patients ≥ 18 years of age admitted between August 2011 and July 2012. Patients who were admitted for at least 2 days before up to 5 days after the receipt of IV contrast will be included. Any patient with unstable renal function and/or on any renal
replacement therapy within 96 hours prior to the receipt of IV contrast will be excluded. Patients will be divided into two groups: those that received IV contrast and concomitant IV vancomycin, and those that received IV contrast alone. The primary endpoint will be the incidence of CIN, defined as an increase in serum creatinine of ≥ 0.3 mg/dL AND at least 25% increase from baseline OR an increase in serum creatinine ≥ 50% from baseline OR a reduction in urine output to less than 0.5 mL/kg/hr for at least 6 hours. A secondary endpoint will be the incidence of CIN-related complications within 7 days of receipt of IV contrast including, need for vancomycin dose adjustment, need for any form of renal replacement, toxicity from another renally eliminated drug, and nephrology consult for renal failure.

Results:
To be presented at the Western States Conference in May 2013.

Conclusion:
To be presented at the Western States Conference in May 2013.

ACPE #:0126-9999-13-575-L01-P

Learning Objectives:
- Explain the impact of concomitant IV vancomycin and IV iodinated contrast on the incidence of contrast-induced nephropathy (CIN).
- Describe the incidence of CIN-related complications in patients on concomitant IV vancomycin and IV iodinated contrast.


566 - ANALYSIS OF ARGATROBAN AND BIVALIRUDIN IN THE MANAGEMENT OF HEPARIN-INDUCED THROMBOCYTOPENIA

B4. General Clinical Practice

Presented by:

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Presenting on Wednesday, May 15 at 11:30 AM in Royal IV

Introduction
Heparin-induced thrombocytopenia (HIT) is an adverse drug reaction to heparin resulting in a prothrombotic state. In patients with HIT, therapeutic options have included danaparoid, fondaparinux, and direct thrombin inhibitors (DTI) such as lepirudin, argatroban, and bivalirudin. Of these anticoagulants, only lepirudin, argatroban, and danaparoid have been approved for patients with HIT based on prospective historically controlled trials. Consequently, the 2012 American College of Chest Physicians Guidelines for HIT recommend argatroban, lepirudin or danaparoid over other nonheparin anticoagulants for those with normal renal function while argatroban is the drug of choice for patients with renal insufficiency. Danaparoid was withdrawn from the United States in August 2002, and lepirudin was discontinued in May 2012. San Francisco Veterans Affairs Medical Center (SFVAMC) has historically utilized argatroban, lepirudin, bivalirudin, and fondaparinux in patients with HIT. There are currently no head-to-head prospective studies comparing any one of the anticoagulants against another; only few retrospective cohort studies exist. Furthermore, the highest level of evidence supporting bivalirudin’s use in HIT stems from case reports. Given the lack of prospective studies and SFVAMC’s current use of bivalirudin in patients with HIT, this study aims to
retrospectively compare this institution’s experience with argatroban and bivalirudin in achieving anticoagulation goals and clinical outcomes.

Methodology
This single-center, retrospective analysis includes patients who received argatroban or bivalirudin for at least 24 hours in the setting of known or suspected HIT between January 1, 2000 and June 30, 2012. Anticoagulation goals (i.e. percentage of activated partial thromboplastin time (aPTT) values within therapeutic range and time to therapeutic aPTT) and clinical outcomes (i.e. new thromboembolic events, bleeding, and mortality) were collected to compare the efficacy and safety between argatroban and bivalirudin.

Results and Conclusion
Will be discussed.

ACPE #:0126-9999-13-576-L01-P
Learning Objectives:
- Describe which DTI, argatroban or bivalirudin, is able to achieve therapeutic anticoagulation goals faster and maintain it for longer.
- Compare the incidence of new thromboembolic events, bleeding, and mortality between argatroban and bivalirudin.


567 - TECH-CHECK-TECH: A STUDY OF EFFICIENCY
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
April Von Allmen, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Sunset IV

Introduction
The 2011 Pharmacy Practice Model Summit outlined 147 points of consensus that describe how pharmacists may optimize their current clinical practice. Allowing pharmacy technicians to practice at the height of their license is an integral part of achieving this aim. One of the points outlined in the consensus was the implementation of tech-check-tech (TCT) within health-systems. There are many studies discussing the safety and accuracy of TCT but none that describe the benefits in regards to improved efficiency and output. The purpose of this study is to evaluate these measures in a large metropolitan hospital and hopefully promote TCT throughout the field of pharmacy.

Methodology
Prior to implementation of TCT data was collected via a time-motion study. Data after implementation of TCT was collected via use of the Pyxis PARx® system which records the time of batch pulls and time of checks through the use of an electronic bar coding system. The primary endpoint is the change in technician and pharmacist time-spent on the ADC fills. Secondary endpoints include assessing the accuracy of technicians and the change in the amount of pharmacist time spent devoted to clinical pharmacy services. Data collected include time of each step within the ADC batch fill process and technician accuracy error rates as well as the type of errors committed. Technician accuracy was measured through an audit process defined by an Oregon Board of Pharmacy approved protocol. All data collected during the time-motion study was recorded by a team of trained
residents and pharmacy students through use of a paper chart system and then transcribed to Microsoft Excel for the purposes of data management. A sample size of 26 in each observational group was determined to detect a difference in time spent by 50% with a margin of error of 10% and a confidence level of 90%.

Results
To be presented. Data collection to be completed by March 31st.

Conclusion
To be presented.

ACPE #:0126-9999-13-577-L04-P

Learning Objectives:
- Explain the importance of tech-check-tech and its implications for the advancement of pharmacy practice.
- Describe the general process by which a technician becomes a validated technician checker.


568 - COMPARISON OF CLINICAL OUTCOMES OF RIVAROXABAN VS ENOXAPARIN FOR THROMBOPROPHYLAXIS AFTER TOTAL HIP OR KNEE ARTHROPLASTY
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
Lily Vu, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Royal V

Introduction
Venous thromboembolism (VTE) is a major source of morbidity and mortality for patients undergoing major orthopedic procedures. As one of the most preventable causes of hospital deaths, it is critical that patients undergoing total hip arthroplasty (THA) and total knee arthroplasty (TKA) receive adequate VTE prophylaxis. In July 2011, rivaroxaban was approved by the FDA as the first oral direct factor Xa inhibitor, offering a convenient alternative to subcutaneously injected options such as enoxaparin and fondaparinux and orally administered warfarin with its numerous food and drug interactions as well as frequent monitoring requirements. Shortly after FDA approval, rivaroxaban was made available at VA Long Beach Healthcare System (VALBHS) for thromboprophylaxis in patients undergoing THA or TKA. Since the introduction of rivaroxaban for thromboprophylaxis, the clinical outcomes of rivaroxaban versus enoxaparin for VTE prophylaxis in our patients undergoing THA or TKA have not been formally assessed.

Methodology
A retrospective chart review will be conducted. Subjects included in this study will be patients undergoing THA or TKA who received thromboprophylaxis with enoxaparin between January 1, 2011 to August 31, 2011 or rivaroxaban between January 1, 2012 to August 31, 2012. Data will be collected from patient medical records via computerized patient record system (CPRS). The primary objectives of this study are to assess the efficacy and safety between rivaroxaban and enoxaparin for VTE prophylaxis after THA and TKA at VALBHS. To assess efficacy, we will compare the rates of deep-vein thrombosis (DVT), pulmonary embolism (PE), and all-cause mortality of these two agents during a period of up to 2 days following the last dose of anticoagulant used for VTE thromboprophylaxis. To assess safety, we will compare the bleeding rates associated with the use of
rivaroxaban and enoxaparin during the selected time period. Clinical outcomes will be evaluated using t-test and descriptive statistics.

Results and Conclusion
Final results and conclusions will be reported after data collection and analysis have been performed.

ACPE #:0126-9999-13-578-L01-P

Learning Objectives:
- Describe differences observed in efficacy and safety between rivaroxaban and enoxaparin for thromboprophylaxis after total hip arthroplasty and total knee arthroplasty at VALBHS.
- List advantages and disadvantages of both rivaroxaban and enoxaparin for thromboprophylaxis after total hip arthroplasty and total knee arthroplasty.


569 - EVALUATING INITIATION OF ALDOSTERONE ANTAGONISTS BY CARDIOLOGY PHARMACISTS

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
Jessica Vu, PharmD
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Presenting on Wednesday, May 15 at 11:30 AM in Royal V

Introduction: Clinical trials have shown that aldosterone antagonists have morbidity and mortality benefits in heart failure (HF) patients, however, there has been provider apprehension in ordering these agents as they have demonstrated increased hospital admissions due to lack of, or inappropriate, lab monitoring in recent studies. The VA Pharmacy Benefits Management services, Medical Advisory Panel, and VISN Pharmacist Executives (VA PBM-MAP-VPE) and Chronic Heart Failure Quality Enhancement Research Initiative (CHF QUERI) recognizes that aldosterone antagonists are underutilized and as a result, have published guidelines recommending use of aldosterone antagonists in systolic HF patients in January 2011. Last year, a pharmacy resident study at the VA Puget Sound Healthcare System (VAPSHCS) found that ~80% of patients were not initiated on appropriate therapy in accordance to the published guidelines.

An action plan has been developed in collaboration with the Chief of Primary Care, primary care providers, and cardiology service line for a proactive approach in identifying patients who meet the criteria for use and enrolling them in the cardiology pharmacy clinic for the initiation and management of aldosterone antagonists in accordance to the published guidelines.

The purpose of this study is to evaluate the impact of clinical pharmacists initiating spironolactone through collaboration with PCPs. This will provide insight into whether our cardiology clinical pharmacists can be utilized to optimize heart failure management at the VAPSHCS.

Methodology: The VISN20 CHF Registry will be used to identify candidates for spironolactone per the VA PBM-MAP-VPE guidelines. Eligible patients include those with primary CHF admissions within the past six months and on a beta blocker (carvedilol, metoprolol succinate, bisoprolol) and ACEI. Patients are ineligible if they have hyperkalemia (K ≥4 mEq/L) or renal dysfunction (CrCl <30 ml/min). If the PCP agrees with the cardiology pharmacist’s recommendation of initiating therapy, patients will be enrolled in the Pharmacy Cardiology Clinic for usual care. During the initial clinic visit, labs will be assessed to determine appropriateness of starting
spironolactone. If initiated, a one week clinic visit will be conducted to determine whether therapy should be continued. If so, the pharmacist will continue to order labs and contact patient by phone follow-up monthly for three months, followed by a three-month follow-up. If the patient is stable after a total of six months on spironolactone, they will be discharged for follow-up by PCP. In addition, a retrospective chart review of Pharmacy Cardiomyology Clinic patients will be done with a primary end point of hyperkalemia incidence. Secondary endpoints will include medication adherence, patient education, and hospital readmissions. Analysis of data will be done with statistical tests appropriate for the type of data collected.

Results and conclusion: To be determined pending data collection.

ACPE #:0126-9999-13-579-L01-P

Learning Objectives:
- Describe how cardiology pharmacists can optimize heart failure management with aldosterone antagonists.
- Describe who would be a candidate for aldosterone antagonists and common adverse effects.


570 - EVALUATION OF A HOSPITAL-DEVELOPED PAIN PATHWAY IN DECREASING POST-OPERATIVE OPIOID USE IN GYNECOLOGIC SURGERY PATIENTS

A5. Neuro-Psych or Pain Management Agents

Presented by:

Giang-Tien Vu, PharmD

Tripler Army Medical Center

Presenting on Wednesday, May 15 at 1:30 PM in Palm III

Background:
Adequate pain control is an important aspect of post-surgical care that may prevent the progression of acute pain into chronic pain. For the majority of patients, pain control is typically managed with opioids, either through the epidural, intravenous or oral routes. However, many published studies have depicted alternative measures to include a coordinated multimodal approach starting prior to the first incision. As heavy reliance on opioids can result in various complications, a multimodal approach may decrease opioid utilization and improve post-surgical outcomes.

At our institution, gynecological patients were identified as having significant pain post-operatively, as noted by their longer post-anesthesia care unit (PACU) stay. Thus, a multimodal Gynecology (GYN) Pain Pathway was developed and implemented. The GYN Pain Pathway consists of administering oral and intravenous (IV) acetaminophen and oral gabapentin to patients pre and post-operatively.

Objectives:
This retrospective study aims to primarily assess whether the implementation of the multimodal GYN Pain Pathway at Tripler Army Medical Center (TAMC) resulted in a decrease in opioid utilization. Secondary outcomes will include PACU length of stay, time to hospital discharge and Numeric Rating Scale (NRS) pain scores.

Methods:
The patient population analyzed will include patients that have undergone abdominal hysterectomy, oophorectomy, salpingectomy or salpingo-oophorectomy. Patients receiving perioperative care under the GYN Pain Pathway will be matched to control patients who underwent the same procedure prior to implementation of the pathway. These patients will also be matched according to prior opioid use and age. To detect a clinically
significant decrease in opioid use of 30% twenty-four hours post-operatively, a total sample size of 48 to 100 patients will be needed. Relevant patient data will be obtained from Department of Defense (DOD) electronic medical records at TAMC: Essentris, CHCS and S3. The total 24-hour opioid utilization will be tallied per patient and converted to its morphine equivalent for comparison. To evaluate this objective, a two-sided paired t-test will be used.

Results/Conclusion:
Preliminary results will be presented.
The views expressed in this abstract are those of the author and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

ACPE #:0126-9999-13-580-L01-P

Learning Objectives:
- Explain the rationale behind the implementation of the GYN Pain Pathway.
- Describe the medications used within the GYN Pain Pathway and the new approach to pain control in gynecologic patients at TAMC.


571 - COMPARING THE PREVALENCE RATES OF THE KCNJ11 POLYMORPHISM (RS5219) BETWEEN DIABETIC AND NON-DIABETIC PATIENTS USING SECOND GENERATION ANTIPSYCHOTICS (SGA)

B1. Ambulatory Care

Presented by:

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Presenting on Wednesday, May 15 at 5:00 PM in Palm III

Introduction: There are several retrospective studies based on large populations have examined the association between second generation antipsychotics (SGA) and type 2 diabetes (T2DM) due to the metabolic adverse effects of SGA. These studies found that patients with SGA use had higher risk of diabetes. African Americans and the underserved population were not represented in these studies. Likewise, there is also a growing amount of literature concerning the effects of genetic variants in KCNJ11 and their association with T2DM. The KCNJ11 gene provides instructions for making parts (subunits) of the ATP-sensitive potassium (K-ATP) channel. K-ATP channels are found in pancreatic beta cells, which secrete insulin. Studies showed that single nucleotide polymorphisms (SNPs) of KCNJ11 gene were significantly associated with the risk of T2DM in Asian populations. Our study looks at the rs5219 variant of KCNJ11, SNP type E23K. Currently, there are no existing studies examining KCNJ11 variants in patients with severe mental illness on SGA in the African American and underserved population and such examination may be warranted to help identify those at higher risk for development of diabetes mellitus or metabolic syndrome and provide prompt preventive care and/or treatment.

Objective: The objective of this study is to determine if patients with the KCNJ11 variant (rs5219) have a higher risk of developing diabetes or metabolic syndrome while on treatment with SGA.

Methods: This is a cross-sectional study consisting of approximately 20 patients from LifeLong Medical Care. The population at LifeLong Medical Care Downtown Oakland is underserved, consisting mostly of African Americans.
They will be included in the study if they are at least 18 years of age and on therapy with a SGA for a minimum of six months. Patient will be excluded from the study if they are unable to give informed consent or spit in the collection kit, pregnant or breast-feeding, or have severe mental illness. Retrospective chart reviews were done to obtain age, gender, ethnicity, body mass index, and baseline blood pressure. Laboratory data collected from the charts were lipid levels and renal function. Patient’s current medications are recorded with a focus on medications used to treat diabetes mellitus, hypertension, hyperlipidemia, and severe mental illness. On the day of the visit, laboratory data collected included random plasma glucose, hemoglobin A1c, and a spit sample. STATA Release 12 will be used for statistical analysis. Chi-square analysis will be used for nominal variables and student’s t-test will be employed for continuous variables to determine baselines differences in demographics between the two groups. The variant screened for is located in the KCNJ11 gene and is rs5219. Those running the analyses will be blinded to the other data obtained from the patient. Pyrosequencing technology will be employed to genotype all study subjects.

Main Outcome Measures: Among those on SGA, compare the prevalence of KCNJ11 gene variant (rs5219) between the diabetic and non-diabetic group.

Results/Conclusion: To be presented.

ACPE #:0126-9999-13-581-L01-P

Learning Objectives:
- Define the role of KCNJ11 gene variant (rs5219) in the development of type 2 diabetes mellitus in patients on second generation antipsychotics.
- Define the role of KCNJ11 gene variant (rs5219) in the development of metabolic syndrome in patients on second generation antipsychotics.


572 - PIPERACILLIN/TAZOBACTAM DOSING STRATEGIES FOR TREATING PSEUDOMONAS AERUGINOSA INFECTIONS WITH MICS ≥16 MCG/ML

A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 3:00 PM in Mission Bay

Background: Laboratory and clinical evidence support the use of extended infusion piperacillin/tazobactam (pip/tazo) over traditional dosing, every six hours, for treating Pseudomonas aeruginosa (PA). However, it is unknown if this strategy is optimal for PA infections in which the minimum inhibitory concentration (MIC) ≥16 mcg/mL. Recent data suggests traditional empiric pip/tazo dosing for PA infections with reduced pip/tazo sensitivity was associated with increased mortality. Beta-lactam efficacy is based upon the pharmacokinetic principle of maintaining the serum concentration above the MIC for greater than 50% of the dosing interval. Limited information is available regarding the efficacy of a continuous infusion regimen of pip/tazo with optimized pharmacokinetic parameters compared to either EI or traditional dosing in treating infections due to PA with elevated MICs.

Methods: A retrospective 1:1:1 (pip/tazo continuous infusion, extended infusion, or traditional dosing) matched case-control study was performed at University Medical Center of Southern Nevada on patients admitted from
January 2008 - December 2012. Patients with a positive culture for PA, a documented MIC ≥16 mcg/mL, and clinical signs of infection were eligible for the study. Patients enrolled were matched based on pip/tazo MIC, age (± 5 years), and level of hospital care. Data was collected from electronic and paper medical records. Radiologic dictations, progress notes, and laboratory data were evaluated for clinical improvement or deterioration. Sequential Organ Failure Assessment (SOFA) scores were calculated and compared between baseline and the first 48 hours from pathogen isolation to trend risk of mortality. The primary outcome was clinical response of patients receiving pip/tazo therapy. Secondary outcomes included all cause mortality, length of ICU stay, microbiological cure, and a need for change in antibiotic therapy.

Results and conclusions: To be presented

ACPE #:0126-9999-13-582-L01-P
Learning Objectives:
1) Describe the rational for the use of non-traditional dosing strategies pip/taz for the treatment of PA.
2) Explain the importance of Clinical and Laboratory Standards Institute’s pip/tazo minimum inhibitory concentration for PA.


573 - EVALUATION OF AN INTERVENTION TO REDUCE PROTON PUMP INHIBITOR USE AT THE VA SOUTHERN NEVADA HEALTHCARE SYSTEM (VASNHS)
B1. Ambulatory Care

Presented by:

Lisa Wang, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Palm III

Introduction: Proton pump inhibitors (PPIs) were introduced in the late 1980s and are one of the most widely used medications to reduce gastric acid secretion. Although they are generally safe and well tolerated, they are often overused or used without a proper indication. Studies have estimated that approximately 50% to 65% of acid suppressive medications in the hospital are inappropriately prescribed. Many of these patients are discharged on a PPI without a proper indication. Overuse of PPIs can lead to adverse clinical effects such as an increased risk of community acquired pneumonia (CAP) infections, Clostridium difficile infections, hip, wrist, and spine fractures, hypomagnesemia, Vitamin B12 deficiency, and iron deficiency. Therefore, it is important to re-evaluate the patient’s condition and consider the discontinuation of PPIs when symptoms have resolved and PPIs are no longer indicated.

With the recent concerns of PPI use, the VA Southern Nevada Healthcare System (VASNHS) clinical pharmacists reviewed all active PPI prescriptions that had not been refilled within the past four months beginning in March 2012. If patients met inclusion criteria, their PPI was discontinued and they received a letter, which explained the recent concerns of PPI use and instructions to contact the pharmacy or their primary care provider for alternatives or if they wished to resume the PPI. Providers were also informed of the implementation and plan which highlighted the problems associated with PPI use thus encouraging judicious use of PPI prescribing.

Methodology: This is a retrospective chart review aimed at decreasing the number of unnecessary active PPI prescriptions for Veterans who no longer require the medication and to reduce drug-costs at the VASNHS. Data
collection begins with pharmacist screening and subsequent intervention between March 2012 and June 2012. The study sample includes Veterans of all ages, both male and female with an active PPI prescription that had not been filled in four months. The number of patients meeting the inclusion criteria for the PPI discontinuation letter was 1000. Exclusion criteria included: diagnoses (GI bleed, Barrett’s esophagus, or current ulcer), patients that had moved, or were deceased. The computer system Veterans Health Information Systems and Technology Architecture (VISTA) will be used to follow up on those patients that received the discontinuation letter and if needed, Computerized Patient Record System (CPRS) will be reviewed. The overall impact of pharmacist intervention will be assessed by reviewing the number of patients that remained discontinued on PPIs and cost will be assessed by calculating the cost of drug the VASNHS no longer has to supply due to the discontinuation of the PPIs.

Results and Conclusion: Will be presented.

ACPE #:0126-9999-13-583-L01-P

Learning Objectives:
- Describe the concerns related to long-term proton pump inhibitor (PPI) use.
- Explain whether the pharmacist intervention can be applied to other drug classes or facilities.


**574 - IDENTIFYING THE BARRIERS AND INCENTIVES RELATED TO ENROLLMENT IN EMPLOYER-SPONSORED HEALTH AND WELLNESS PROGRAMS**

B2. Community Practice

Presented by:

Jennifer Wang, PharmD
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*Presenting on Tuesday, May 14 at 3:30 PM in Sunset V*

Introduction:
Quality Food Centers (QFC) offers four different pharmacist-run health coaching programs to its employees. The four health coaching programs are: smoking cessation, diabetes, heart healthy, and fitness, nutrition, and weight loss. These health coaching program have demonstrated clinical improvements in diabetes management and cardiovascular health. However, out of 353 eligible employees, less than 5% of employees participate in these wellness programs. The objective of this study is to create and implement an interactive survey that will identify employee barriers to participation and assess the effectiveness of an educational survey tool to engage participation in health coaching programs.

Methodology:
In phase I of this study, two types of focus groups will be conducted. The first focus group will consist of patients enrolled or previously enrolled in health coaching. The second focus group will consist of patients not currently enrolled in health coaching. The responses from the focus groups will be used to better understand potential barriers and help target survey questions. In phase II of the study, an interactive survey will be implemented. The survey design will be interactive in that each response to a question will provide specific education and feedback based on a participant’s answer to a question. After development of the interactive survey, it will be piloted in 5 laypersons to improve clarity of questions. In the last phase of the study, the survey will be electronically sent to all eligible employees. Inclusion criteria are those who are 18 years or older and eligible for
health coaching. Eligible employees for health coaching include those who meet one of the following criteria: blood pressure >140/90, LDL > 160, blood glucose > 126, and BMI > 29. Responses from the survey will be securely recorded without patient identifiers. If participants are interested in beginning health coaching, they may voluntarily provide their contact information for follow-up by a QFC clinical pharmacist. Survey responses and questions will be numerically coded and analyzed.

Results: Pending
Conclusion: Pending

ACPE #:0126-9999-13-584-L04-P

Learning Objectives:
- Explain the most common patient factors for not enrolling in employer-sponsored health and wellness programs.
- Describe the effect of using an interactive survey for promoting health and wellness programs.


575 - - OUTCOMES AND CHALLENGES OF BAR CODE MEDICATION ADMINISTRATION: A SYSTEM-WIDE ANALYSIS ON MEDICATION ERRORS
C2. Technology Management (Comp/InfoSys/Drug Dist)

Presented by:

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Presenting on Wednesday, May 15 at 3:30 PM in Palm II

Introduction
The importance of preventing medical errors has been a long-standing goal of health care since the Institute of Medicine addressed its importance in “To Err is Human: Building a Safer Health System,” highlighting that a hospitalized patient, on average, is exposed to one medication administration error per day. The dispensing and administration of medication are two of the most error-prone steps of the medication-use process, constituting 11% and 26-38% of medication errors. Bar-code medication administration (BCMA) is an additional safety barrier and an essential, fundamental step in creating a closed loop medication system; it assists the nurse in assuring the first five rights of medication safety – right patient, right medication, right route, right dose, and right time.

The implementation of BCMA is a process improvement methodology, not just a project on a checklist. Prior to the go-live, it requires high degrees of interdisciplinary collaboration among medical and hospital staff and accentuates the need for support and process introspection of executive leadership. Change management, education and training of the staff are also critical steps for BCMA implementation. Following the go-live, the goals become focused on optimization and stabilization of the new technology, rendering it important to use the data generated by the system to understand the changes in the types of medication errors and the new challenges and workarounds posed by BCMA.

Objectives
To determine the impact of bar code medication administration (BCMA) on the overall reported medication error rate, types of medication errors, level of harm associated with the medication errors and follow-up actions taken on the medication errors.
To describe several types of medication errors that previously went undetected prior to BCMA.

Methodology
Data was reviewed from June 2012 through September 2012 for pre-BCMA medication error rates and November 2012 through February 2013 for post-BCMA medication error rates at the UC Davis Medical Center. Data were comprised of all reported medication errors as categorized by incident reporting (IRs). Errors types included in the analysis are those hypothesized to be impacted by implementation of BCMA. The process nodes included in the analysis are dispensing and administering, as BCMA is not expected to have impact on the prescribing and monitoring nodes. Data collection included date, location, harm level, process node, staff involved with error, type of error and follow-up actions taken.

Results
After the exclusion of all areas without BCMA implementation (i.e. the emergency department and PACU), there are currently 241 incident reports for the hospital during the seven-month study period that fell in the error categories included for the study; the final month of data collection will be complete after the end of February.

ACPE #:0126-9999-13-585-L05-P

Learning Objectives:
- To determine the impact of bar code medication administration (BCMA) on the overall reported medication error rate, types of medication errors, level of harm associated with the medication errors and follow-up actions taken on the medication errors.
- Describe several types of medication errors that previously went undetected prior to BCMA.


576 - EVALUATING COLLABORATIVE EPOETIN MANAGEMENT VS. STANDARD CARE FOR MYELODYSPLASTIC SYNDROME AND MULTIPLE MYELOMA PATIENTS

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
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Presenting on Wednesday, May 15 at 4:30 PM in Sunset I

Introduction:
Myelodysplastic Syndrome (MDS) and multiple myeloma are diseases that commonly cause anemia due to bone marrow destruction. Curative treatments for this type of anemia are lacking, and erythropoietin stimulating agents (ESAs) represent one of few therapeutic options available to prevent or delay patients from becoming transfusion dependent. Recent studies have shown that patients using ESAs who have a higher therapeutic hemoglobin targets (≥12gm/dL) are more likely to have adverse outcomes such as myocardial infarction, stroke, or deep vein thrombosis/pulmonary embolism. The Kaiser Permanente Fresno Medical Center has employed a collaborative approach to ESA management involving clinical pharmacists for several years; however the value of this program has not yet been assessed. This study is the first to use quantitative data to evaluate whether the addition of a clinical pharmacist improves health and safety outcomes of MDS and multiple myeloma patients being treated with epoetin.

Methodology:
Patients with MDS or multiple myeloma and subsequent epoetin therapy were identified in two Kaiser Permanente service areas (SA) in the Northern California region: Fresno SA and Central Valley SA. One hundred fifty five patients were identified with MDS or multiple myeloma diagnosis and subsequent epoetin therapy from 7/1/2007 to 7/1/2012 across the Central Valley and Fresno SAs. Central Valley SA patients served as a control group representing standard care of MDS and multiple myeloma patients while on epoetin therapy with no clinical pharmacist involvement, while Fresno SA patients represented the test group of patients managed with a collaborative approach. Retrospective chart review was performed for each patient to determine clinical outcomes. The study included all patients who received epoetin for at least 2 months after diagnosis of multiple myeloma or MDS. Patients were excluded from the study if they received epoetin before diagnosis of MDS or multiple myeloma, received epoetin only in the inpatient setting, received epoetin for less than 2 months duration, or were patients in the Fresno SA that did not have collaborative epoetin management. The primary study outcome compares the average number of months over a one year treatment period that patients on epoetin are at goal (hemoglobin less than 12 gm/dL and transfusion independent) in the test vs. control group. Secondary outcomes include any differences in the number of transfusions received between the two groups, the length of time a patient’s hemoglobin remains above 12 gm/dL in either group (indicative of increased risk of adverse effects), the average dose of epoetin used to maintain target hemoglobin in both groups (indicative of cost of therapy), and any differences in adverse events related to epoetin in both groups.

Results and Conclusion:
The results and conclusions of this study will elucidate any potential benefits of collaborative care vs standard care of MDS and multiple myeloma patients on epoetin therapy. Final results and conclusions will be presented.

Learning Objectives:

Explain the benefits and risks of using epoetin in myelodysplastic syndrome and multiple myeloma patients
Describe potential benefits of having a pharmacist-provider collaborative approach to the management of epoetin


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**577 - EVALUATION OF SHIVERING CONTROL IN ADULT PATIENTS ON THERAPEUTIC HYPOTHERMIA OR NORMOTHERMIA BEFORE AND AFTER IMPLEMENTATION OF A STEP-WISE SHIVERING MANAGEMENT PROTOCOL**

B3. Critical Care

Presented by:

Dimay Wang, PharmD

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**Presenting on Wednesday, May 15 at 3:00 PM in Executive 713**

Background: Shivering is a physiological response that is triggered when core body temperature drops below the hypothalamic set point. Shivering is one of the largest challenges associated with therapeutic hypothermia and normothermia. Shivering is detrimental as it can trigger massive increases in systemic and cerebral energy consumption and metabolic demand which can increase intracranial pressure (ICP) and cerebral edema. Control of shivering is imperative as it slows the cooling process and prolongs the time to target temperature.
With the increasing use of therapeutic hypothermia and normothermia at UC San Diego Health System (UCSDHS), an evidence-based step-wise shivering protocol was developed to standardize shivering management and to address the need for better control. Many anti-shivering therapies are associated with prolonged sedation and the use of neuromuscular blockers (NMB) which can obscure neurological exams and prolong length of stay in the ICU. However, the step-wise shivering protocol at UCSDHS encourages the use of non-sedating therapies and reserves the use of NMB infusions as last line modality. Currently there are no validated shivering protocols available; therefore the goal of this study is to assess the effectiveness of UCSDHS shivering protocol.

Methods: This will be a retrospective chart review of all adult patients initiated on Arctic Sun for therapeutic hypothermia or normothermia between October 2012 and September 2013. Control group patients will be identified from the Arctic Sun database prior to shivering protocol implementation. After shivering protocol implementation and education, patients will be consecutively identified for retrospective chart review. The primary objective of this study is to determine the efficacy of UCSDHS’ shivering management protocol, as defined by the number and severity of shivering episodes before and after implementation and education of the shivering protocol. Secondary endpoints include time to achieve goal temperature for hypothermia, time within goal temperature (± 0.5°C of goal) for normothermia, ICP control and disposition at discharge.

Results/Conclusions: The results and conclusions will be presented upon completion of data collection and analysis.

ACPE #:0126-9999-13-587-L01-P

Learning Objectives:
- Describe the impact of UCSDHS’ shivering protocol on the control of shivering in patients who are initiated on Arctic Sun for therapeutic hypothermia and normothermia
- Discuss different pharmacologic therapies that can be employed to manage shivering in patients who are initiated on therapeutic hypothermia or normothermia


578 - EVALUATION OF A NEW COLUMNAR IV INSULIN INFUSION PROTOCOL IN A COMMUNITY HOSPITAL
B4. General Clinical Practice

Presented by:

Johnny Wang, PharmD
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Presenting on Wednesday, May 15 at 1:00 PM in Royal IV

Introduction:
Hyperglycemia has a negative impact on hospitalized patients, including higher risk for morbidity and mortality. Tight glycemic control has shown to improve patient outcomes, especially for patients in the critical care units. The primary objective of this study is to determine if the new protocol improves the time to reach therapeutic blood glucose range and reduces the incidence of hypoglycemia compared to the previous protocol. Secondary objectives include protocol compliance including administration and blood glucose monitoring.

Methods:
In November 2012, Providence Tarzana Medical Center started a pilot study using the Providence System Columnar Insulin IV Infusion protocol in the ICU and CVICU to improve hyperglycemia control and reduce the incidence of hypoglycemic episodes. A redesigned insulin infusion algorithm (Columnar protocol) was implemented that required nurses to adjust insulin infusion rates by using a table with specified rates rather than manually calculating a new rate with each hourly glucose reading. All nurses in these units were trained on the new Columnar protocol prior to its implementation. In addition, the standard insulin concentration was changed from 0.2 unit/mL to 1 unit/mL to align with the regional standard. All patients on the Columnar Insulin Infusion protocol for greater than 24 hours were enrolled in this study. The safety and efficacy of this protocol will be compared to our previous insulin infusion protocol. Results and conclusions of the study will be presented and discussed.

ACPE #:0126-9999-13-588-L01-P

Learning Objectives:
- Explain the efficacy and safety of the Columnar Insulin Infusion protocol.
- Describe factors that affect the Columnar Insulin Infusion protocol compliance.


579 - USAGE PATTERNS AND OUTCOMES OF ERLOTINIB TREATMENT FOR NON-SMALL-CELL LUNG CANCER
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

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Presenting on Wednesday, May 15 at 3:30 PM in Sunset I

Introduction:
Erlotinib Hydrochloride is an oral epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor indicated for the treatment of locally advanced or metastatic non-small-cell lung cancer (NSCLC). It was FDA approved in November 2004 on the basis of an initial phase III clinical trial which demonstrated a benefit in progression free survival (2.2 months vs. 1.8 months, P<0.001) and overall survival (6.7 months vs. 4.7 months, p<0.001) versus placebo in the treatment of NSCLC refractory to platinum-based chemotherapy. The objectives of this study are to characterize adherence, persistence, and clinical outcomes of patients initiated on erlotinib chemotherapy in a real-world setting. Secondarily, we will analyze the influence of adherence and persistence on clinical outcomes.

Methodology:
This is a retrospective study of VA Palo Alto Health Care System Cancer Care Program patient data collected from the erlotinib FDA approval date (November 18th, 2004) to September 1st, 2012. All VAPAHCS patients greater than 18 years of age who were initiated on erlotinib between 11/18/2004 and 8/31/2010 were included. Patients were excluded if they were treated with erlotinib for an indication other than NSCLC or lost to follow-up due to transfer of care. Baseline demographic characteristics such as age, gender, EGFR mutation status, smoking status, tumor staging, and histological subtype were described. Adherence was measured by the medication possession ratio (MPR), defined as the number of medication days supplied divided by total duration of treatment and adjusted for days of hospitalization. Persistence was measured by overall duration of drug
therapy and time from treatment discontinuation to death. Clinical outcomes were measured by overall survival and progression free survival. Secondary outcomes included episodes of adverse drug reactions resulting in treatment interruption or discontinuation and the nature of the reaction.

Preliminary Results:
A total of 137 patients met the inclusion criteria. To date, 22 patients have been evaluated for effectiveness. Mean MPR was 1.04 ± 0.23. Twenty percent of patients were instructed to hold therapy due to erlotinib toxicity, most commonly for rash (50% of cases held). The cumulative duration of holds for all cases ranged from 23 to 240 days. Two patients discontinued treatment due to toxicity. Median duration of therapy was 3.27 months and the median time from treatment discontinuation to death was 1.03 months. Median progression free survival was 3.5 months, with a median overall survival of 4.36 months. Final results and conclusion will be presented.

ACPE #:0126-9999-13-589-L01-P
Learning Objectives:
- Describe the erlotinib usage patterns of the veteran population at VAPAHCS.
- Describe the effectiveness of erlotinib chemotherapy in a real-world patient population.


580 - ADHERENCE AND RECURRENCE RATES OF C. DIFFICILE INFECTION FOR A 6-WEEK TAPERING REGIMEN OF ORAL VANCOMYCIN SOLUTION
A1. Infectious Disease - Anti-infective Agents

Presented by:

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Presenting on Wednesday, May 15 at 3:30 PM in Mission Bay

Clostridium difficile infection (CDI) is the leading cause of antibiotic-associated diarrhea. It is also a significant health care-associated infection, accounting for 20 to 30% of all nosocomial antibiotic-associated diarrheas. Unlike other infectious processes, CDIs have a high rate of relapses due to its ability to form spores that are highly resistant to antimicrobial therapy.

Tapering regimens of oral vancomycin solution (i.e., oral vancomycin four times daily for 2 weeks, then twice daily for 1-2 weeks, then once daily for 1-2 weeks, and finally once every two to three days for 2-8 weeks) are thought to have the benefit of eradicating vegetative forms of Clostridium difficile while allowing the normal gut flora to recolonize the intestines. Tapering regimens of oral vancomycin are recommended by the Infectious Diseases Society of America as a strategy to cure recurrent CDI. Recently, the use of a 6-week taper (i.e., four times daily for 2 weeks, then twice daily for 2 weeks, then once daily for 2 weeks, and stop) was shown to be effective and safe for treating CDIs and reducing recurrences.

Antimicrobial therapy is most effective if the patient is adherent to the therapy and completes the full course of treatment. Tapering regimens of oral vancomycin solution poses unique potential barriers that do not apply to other antimicrobials. First, vancomycin oral solution has an unpleasant taste, which may lead to poor compliance with the full 6-week regimen, especially once the patient’s symptoms are resolved. Second, vancomycin solution requires compounding with a stability of 14 days. With a 6-week tapering regimen of oral
vancomycin, patients would have to return to the pharmacy at least three times. And finally, each phase of the taper has a different dosing frequency, which may lead to improper dosing by patients who lack health literacy.

My study will attempt to assess the adherence rate of patients who are placed on a 6-week tapering regimen of oral vancomycin solution, analyze the impact of incomplete adherence on CDI recurrence rates, and identify patient characteristics that are associated with poorer adherence which may be addressed/targeted in the future.

In this retrospective study, I will review pharmacy fill records from January 1st, 2011 through September 30th, 2012 for oral vancomycin solution. Patients included in the study must have a positive diagnosis for CDI, ≥18 years of age, and taking oral vancomycin as part of a tapering regimen. Patients were excluded if they were prescribed vancomycin capsules or if they had a recurrence of CDI while on treatment with oral vancomycin solution.

The primary outcome of this study is full adherence to the 6-week taper. Secondary endpoints will include 60-day CDI recurrence rate, hospitalization due to CDI, and all-cause mortality.

Results will be forthcoming, once data collection and analysis are completed.

ACPE #:0126-9999-13-590-L01-P
Learning Objectives:

- Describe the adherence rate of the 6-week tapering regimen of oral vancomycin solution in patients treated in the Kaiser GSAA service area.
- Explain relevant patient characteristics that can be targeted to improve adherence.


**581 - EFFECT OF SYSTOLIC BLOOD PRESSURE TREATED TO LESS THAN OR ABOVE 130 MMHG IN VERY ELDERLY VETERANS**

B5. Long-Term, Geriatric or Hospice Care

Presented by:

**Courtney Waye, PharmD**
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*Presenting on Tuesday, May 14 at 2:30 PM in Sunset IV*

Introduction: The very elderly population, defined as those 80 years of age and older, is the most rapidly growing age group in the United States. Hypertension is prevalent in over two-thirds of patients 75 years of age and older, and is the leading cause of cardiovascular disease, congestive heart failure, and stroke. The American College of Cardiology Foundation/American Heart Association (ACCF/AHA ) recommends that very elderly patients benefit from treatment to a goal of <150/80 mmHg, but it is unknown whether further lowering of systolic blood pressure (SBP) benefits these patients. The objective of this study is to evaluate the rate of hospitalization due to cardiovascular causes and stroke in a very elderly Veteran population with hypertension treated to a blood pressure level of <130 mmHg or 131-149 mmHg.

Methods: This research is the result of work supported with resources and the use of the facilities at the Southern Arizona VA Health Care System (SAVAHCS), Tucson AZ. This study has been approved by the SAVAHCS Institutional Review Board, and Research and Development Committee. This is a historical prospective study utilizing electronic medical records at SAVAHCS to identify patients who were 80 years of age and older between January 1, 2001 and July 31, 2011, have a diagnosis of hypertension by International Classification of Diseases,
Ninth Revision (ICD-9) code, and are treated with at least one antihypertensive agent. Subjects have to have been on the antihypertensive agent(s) for at least one year, and have at least two ambulatory blood pressure readings over the follow-up period to be included in the study. Data collection will include mean systolic blood pressure, sex, co-morbid conditions, length of therapy on antihypertensive agents, total number and type of cardiovascular or cerebrovascular events, last systolic blood pressure prior to those events, and hospitalizations due to falls. The follow up period will be until all antihypertensive medications are discontinued, conclusion of the study period (August 1, 2012), or death. The primary endpoint of hospitalizations due to cardiovascular events and/or stroke will be assessed utilizing ICD-9 codes and extensive chart review. Secondary endpoints will include incidence of cardiovascular-related hospitalizations resulting in death, all-cause mortality, discontinuation of antihypertensive medication, and falls resulting in hospitalization or fractures. Study cohorts will be categorized into two blood pressure groups of <130 mmHg and 131-149 mmHg for statistical analysis. Comparison between the mean systolic blood pressures in each group will be measured using student’s t-test, whereas the statistical differences in the primary endpoint will be analyzed using Chi-squared statistics. All data will be recorded without patient identifiers to maintain confidentiality.

Results and Conclusion: To be presented

ACPE #:0126-9999-13-591-L01-P

Learning Objectives:
1. Describe current guideline-directed treatment goals of hypertension in the very elderly population
2. Explain the risks and benefits of aggressive treatment of hypertension in the very elderly population, concerning hospitalization due to cardiovascular event and/or stroke, as well as falls resulting in hospitalization/fractures.


582 - EXAMINING THE PHARMACIST ROLE IN HOSPITAL DISCHARGE FOLLOW-UP AT A COMMUNITY HEALTH CENTER

B1. Ambulatory Care

Presented by:
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Presenting on Wednesday, May 15 at 3:30 PM in Royal IV

Introduction: Poor care transitions are often linked to high hospital readmission rates as shown in a 2009 study where 20% of elderly patients were rehospitalized within 30 days of discharge. CMS now reduces payments to hospitals with excess readmissions in response to the growing problem. Discrepancies in medications, inadequate adherence, and adverse drug events (ADEs) are an important factors contributing to readmission rates. Medication Therapy Management (MTM) programs provided by pharmacists are designed to target these problems. Even with this knowledge, utilization of pharmacists is low during care transitions. Those pharmacists involved in the transition of care consider medication reconciliation, although time consuming, to be their most important role. In addition, a stated priority of the Affordable Care Act is to decrease the risk of ADEs by 50%. Among the recommendations to reduce the number of ADEs during care transitions, many contain roles suited to the skill set of a pharmacist. These include ensuring adequate communication, improving care coordination,
and the sharing the responsibility for these transitions among clinicians. Though, all patients are at risk for drug therapy problems (DTPs) during transition of care, specific at risk populations are older adults, those with limited health literacy, lower incomes, and the homeless. Commonly, these populations are served by Community Health Centers (CHCs). Though pharmacist involvement in the transition of care is supported by the literature, little evidence exists to highlight the advantage in CHCs.

Methodology: This is an observational, prospective evaluation on the impact of a primary care clinical pharmacist on medication reconciliation and care management after hospital discharge. The patient population will be all patients scheduled for follow up at North Country HealthCare (NCHC), who were recently discharged from Flagstaff Medical Center (FMC) over a 5 month period beginning in December 2012. NCHC is a Federally Qualified Health Center (FQHC) emphasizing primary care with clinics across northern Arizona. NCHC of Flagstaff will be the primary intervention site and serves a diverse socioeconomic and ethnic population. All patients scheduled for hospital follow-up with one of three designated providers were included. Level of intervention is at the discretion of the pharmacist. Prior to outpatient visit following discharge from FMC, the pharmacist will present the provider with an up to date medication list, a summary of the hospital course, and list any potential DTPs with recommendations for resolution.

Objective: The primary objective is to determine the type and frequency of DTPs present after hospital discharge and in what capacity pharmacist recommendations are adopted. The secondary objective involves surveying the individual providers for perceived benefit.

Results/Conclusion: Results of this investigation are currently pending. Proposed interventions ought to identify previously unaddressed DTPs and improve patient outcomes, continuity of care, and provide cost savings, as a result. Interventions should also help to clarify and establish the pharmacist role in transition of care.

ACPE #:0126-9999-13-592-L01-P
Learning Objectives:
- Describe the various drug therapy problems present at hospital follow-up and the extent of provider acceptance of pharmacist recommendation.
- Explain the benefit to providers of including a pharmacist in the transition of care.


583 - PHYSICIAN VS. PHARMACIST DOSING OF VANCOMYCIN IN SKIN AND SOFT TISSUE INFECTIONS (SSTIS)
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 4:00 PM in Mission Bay

BACKGROUND Vancomycin is a glycopeptide antibiotic used to treat gram-positive infections, and is first-line therapy for methicillin-resistant Staphylococcus aureus infections. Therapeutic guidelines from the American Society of Health-System Pharmacists, Infectious Disease Society of America, and Society of Infectious Disease Pharmacists suggest that vancomycin trough concentrations are the most practical method of monitoring vancomycin. Optimal trough levels are recommended to be kept above 10mg/L to prevent development of resistance in S. aureus. In February 2009 there was a policy change at University Medical Center of Southern
Nevada (UMCSN) that required vancomycin to be dosed and monitored by physicians. Previous to this time, the pharmacists monitored and adjusted all vancomycin. This change was made due to the lack of evidence suggesting vancomycin troughs kept within the 10-20mg/L range produce better patient outcomes. It was decided clinical improvement of patients was considered more pertinent to patient care than just trough target attainment. Determination of "clinical improvement" is considered "practicing medicine" and as such, beyond the scope of pharmacy practice. Taking advantage of this unique situation, we decided to evaluate potential differences in patient outcomes between physician and pharmacy vancomycin dosing.

OBJECTIVE To evaluate clinical outcomes in patients with SSTI treated with vancomycin when dosed by pharmacists compared to physicians.

METHODS A retrospective chart review was conducted of all patients admitted to UMCSN from January 2008 to January 2012 who were started on vancomycin for suspected SSTI. Eligible patients were included if vancomycin was continued for at least 72 hours. Exclusion criteria consisted of unstable renal function, osteomyelitis, hardware infections, septic joints, and multiple missed doses of vancomycin. Data collected included concurrent antibiotic therapy, supportive evidence of infection, and culture data. Patients were divided into two groups: those treated before the policy change (pharmacy dosed) and those treated after the policy change (physician dosed). The primary endpoint was time to clinical resolution of symptoms. Secondary objectives were trough target attainment and number of dosing adjustments. Renal failure and other toxicities were also evaluated.

RESULTS AND CONCLUSIONS The results of this study will be presented.

ACPE #:0126-9999-13-593-L01-P

Learning Objectives:
- Compare pharmacist vs. physician dosing of vancomycin on time to clinical resolution of symptoms of skin and soft-tissue infections.
- Explain the differences between pharmacist vs. physician dosing on vancomycin trough target attainment and dose adjustments.


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584 - DESIGN, IMPLEMENTATION, AND MONITORING OF A PHARMACIST-RUN MEDICATION RECONCILIATION AND DISCHARGE COUNSELING PROGRAM AT A MULTICENTER HEALTH-SYSTEM

D1. Medication Safety

Presented by:

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Presenting on Wednesday, May 15 at 4:30 PM in Palm I

INTRODUCTION:
One of the burning issues facing health-systems today is identifying how to improve the transition of care between acute and ambulatory care settings to avoid identifiable medication related adverse events. The most relevant approach to addressing this issue is for institutions to implement standards of practice to reconcile patients’ medications at critical points such as transitions between providers, facilities, services, etc. Pharmacist involvement in medication reconciliation and patient consultation is supported by federal and professional
organizations including, but not limited to, the Joint Commission, the American Society of Health-System Pharmacists, and the California Society of Health-System Pharmacists. Pharmacist-run medication reconciliation and discharge counseling programs have shown to be an effective method of identifying and correcting medication errors and improving patient safety in a cost effective manner. This paper describes a residency project focusing on the design, implementation, and assessment of a pharmacist-run medication reconciliation and discharge counseling pilot program at Palomar Health, a three hospital multicenter health-system in San Diego County, CA.

METHODS:
This program was designed utilizing the ASHP Guidelines for Pharmacist Conducted Patient Education and Counseling as well as the Indian Health Service Standards of Practice. Prior to implementing this service, all pharmacists were trained on verbal and non-verbal communication skills relevant to patient consultation, procedures outlining the medication reconciliation and discharge counseling processes, and documentation standards.

Patients are included to this service if they are discharged with orders for insulin, anticoagulation, new medications since admission, changes to pre-existing medication regimens, or per request. After discharge orders are placed, the pharmacist reconciles the patient’s medications, prepares a medication schedule to give the patient, and consults the patient regarding inclusion medications in addition to any medications the patient requests. The consultation is documented in the patient’s electronic medical record. Patients are excluded from this service if they are discharged to any facility in which they are not in primary control of their medication therapies.

RESULTS & CONCLUSION:
Will be presented on.

ACPE #:0126-9999-13-594-L01-P
Learning Objectives:
- List core medication therapies necessitating discharge consultation.
- Describe the rationale for implementing a pharmacist-run medication reconciliation and discharge consultation program.


**585 - EVALUATION OF AN ON-SITE DIABETES EDUCATION PROGRAM TO INDEPENDENT LIVING SENIORS WITH TYPE 2 DIABETES OR PRE-DIABETES**

B2. Community Practice

Presented by:

**Matt Weisser, PharmD**
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*Presenting on Tuesday, May 14 at 4:00 PM in Sunset V*

Introduction: While it is generally recognized that the healthcare and economic burden caused by diabetes in the U.S. continues to increase, less recognized is how diabetes disproportionately affects certain population groups. Among the groups most affected is the senior population, with the Centers for Disease Control and Prevention estimating that approximately 42% of the diabetes population is 65 years of age and older in 2011. While management of type 2 diabetes has traditionally focused on medication therapy aimed at improving
glycemic control with some emphasis on diet and exercise, studies have increasingly shown that structured diabetes education programs focused on lifestyle behaviors help facilitate improved glycemic control and other clinical and humanistic outcomes in patients. With older adults being especially vulnerable to losing their independence following acute illness, injury or deterioration in health from chronic diseases, Bartell drugs, a family-owned and operated drug-store chain, piloted an on-site diabetes education program at an independent living senior apartment community for residents with type 2 diabetes or pre-diabetes. The 12-week program was group-based and included the following three classes taught sequentially to subjects; Introduction to Diabetes and Monitoring Your Blood Sugar, Lifestyle Modifications, and Understanding Your Medications and Living with Diabetes. Subjects also had the option to receive pre and post-study measurements of blood pressure and finger-stick measurements of hemoglobin A1c, fasting blood glucose, and fasting lipid panels. Purpose: The purpose of this program was to evaluate an on-site, pharmacist-run diabetes education program for independent living seniors with type 2 diabetes or pre-diabetes by measuring pre and post-study changes in blood pressure, hemoglobin A1c, fasting blood glucose, and fasting lipid panel results, change(s) in diabetes knowledge, and subject satisfaction. Methodology: The study consisted of 5 required phases and 2 optional phases for a total of 7 phases. Phase 1 consisted of subjects completing a consent and demographic form. Phase(s) 2 (pre-study) and 7 (post-study) were optional for subjects and involved measurement of blood pressure and finger-stick measurement of hemoglobin A1c, fasting blood glucose, and fasting lipid panel. Phase 3 involved a pre-class diabetes knowledge questionnaire that subjects completed immediately prior to each class. Phase 4 consisted of the 3 diabetes education classes that subjects attended. Phase 5 entailed a post-class diabetes knowledge questionnaire identical to the questionnaire administered in phase 3 and also a post-class satisfaction survey that subjects completed immediately following each class. Phase 6 involved subjects completing a post-study satisfaction survey. Knowledge questionnaires consisted of multiple choice and true/false questions and satisfaction survey questions were rated on 5 point likert scale. The post-study satisfaction survey also solicited comments and feedback from subjects regarding how to improve the program. Results: Pre and post-study clinical endpoints, and summaries of knowledge assessment and satisfaction survey results will be presented at the Western States Conference in May 2013. Suggestions for improvement and feedback regarding identified strengths and limitations and future direction(s) of this and similar programs will also be discussed.

ACPE #:0126-9999-13-595-L01-P

Learning Objectives:
- Describe how an on-site diabetes education program impacts clinical and humanistic outcomes in independent living seniors with diabetes.
- Explain the important diabetes-related topics and issues that community pharmacists can educate independent living seniors on who have type 2 diabetes or pre-diabetes as part of an on-site diabetes education program.


586 - A RETROSPECTIVE REVIEW OF HYPERTRIGLYCERIDEMIA MANAGEMENT IN HSCT PATIENTS RECEIVING SIROLIMUS-BASED GVHD PROPHYLAXIS

A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:

Ashley Weissman, PharmD

City of Hope
BACKGROUND  Dyslipidemia is one of the early complications following hematopoietic stem cell transplantation (HSCT). While hyperlipidemia is multifactorial, immunosuppressant agents are the most common cause of significant secondary dyslipidemia in this patient population. Specifically, hypertriglyceridemia is known to be associated with the use of sirolimus, an immunosuppressant used for prevention and treatment of graft-versus-host-disease (GVHD) after stem cell transplant. Despite this, limited data regarding the incidence and management of hypertriglyceridemia after HSCT has been published. While there are no established guidelines for evaluation and management of dyslipidemia in HSCT patients, the current practice at City of Hope is to use omega-3 fatty acids, with or without fibric acid derivatives, to decrease serum triglyceride levels.

OBJECTIVE  The goals of this exploratory study are to estimate the incidence of new onset hypertriglyceridemia in allogeneic HSCT patients who received sirolimus-based GVHD prophylaxis and to describe the impact of omega-3 fatty acids on lowering serum triglyceride levels.

METHODS  This is a retrospective chart review of all adult patients who underwent an allogeneic HSCT with sirolimus-based GVHD prophylaxis at City of Hope during 2011. Patients with dyslipidemia prior to transplant will be excluded. Data will be reviewed for demographic information, medical and medication history as well as laboratory data, including cholesterol panel parameters with a focus on triglyceride levels. Treatment and outcomes will be evaluated by reduction of serum triglyceride levels.

RESULTS AND CONCLUSION  The findings of this study will be reported after completion at the upcoming meeting.

ACPE #:0126-9999-13-596-L01-P  
Learning Objectives:  
- Describe the incidence of hypertriglyceridemia early after allogeneic HSCT in patients receiving sirolimus-based GVHD prophylaxis.  
- Describe the impact of omega-3 fatty acids on lowering serum triglyceride levels in this patient population.


587 - RESPIRATORY WELLNESS IN THE MEDICAL HOME: IMPLEMENTING A PHARMACIST-RUN CLINIC FOR ASTHMA, COPD AND SMOKING CESSATION  
B1. Ambulatory Care

Presented by:  
Kristen Wendell, PharmD  
Good Samaritan Regional Medical Center  
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Presenting on Wednesday, May 15 at 4:00 PM in Royal IV

Purpose. The purpose of establishing a pharmacist-run pulmonary wellness clinic at Good Samaritan Regional Medical Center is to provide increased access to primary care services and medication therapy management for patients with asthma, COPD and/or tobacco dependence.
Background. As the Samaritan Health System transitions to the patient-centered medical home model, it is imperative that we develop proactive strategies for identifying and managing chronic disease. Within our system, we have identified a need for better management of chronic respiratory conditions in the primary care setting. Expensive branded medications, inappropriate utilization of drugs and services, and a lack of patient education contribute to high expenditures and poor outcomes for asthma, COPD and tobacco dependence.

Methods. Patients enrolled in the Oregon state health plan with a diagnosis of asthma, COPD and/or tobacco dependency were initially identified by a review of the electronic patient database at Samaritan Family Medicine. Primary care providers at SFM may also initiate referrals on a rolling basis for patients not enrolled in the state health plan. Pharmacists conduct outreach calls to inform patients of the services being offered and to schedule appointments.

Under a collaborative practice agreement, trained clinical pharmacists provide national standards of care for patients with respiratory conditions. Services include office spirometry testing, medication therapy management, and influenza and pneumococcal vaccines for patients with asthma and/or COPD. Pharmacists also collaborate with primary care psychologists in the medical home to provide an interdisciplinary three-session group smoking cessation course that includes a pharmacotherapy option.

Results of this pilot program will be presented.

ACPE #:0126-9999-13-597-L01-P

Learning Objectives:
- List national standards of care for patients with asthma, COPD and tobacco dependency.
- Identify key areas of opportunity for pharmacist intervention in the management of chronic respiratory conditions.


588 - DURABILITY OF GOAL ATTAINMENT AFTER DISCHARGE FROM PATIENT ALIGNED CARE TEAM (PACT) PHARMACY CLINIC

B1. Ambulatory Care

Presented by:

Lauren White, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Royal IV

Introduction: Numerous studies have shown pharmacist-run clinics and a interdisciplinary approach involving pharmacists have improved patients’ cardiovascular risk profiles by meeting goals set by national guidelines more so than usual care. Current guidelines recommend a interdisciplinary approach to optimize patient care, including goal attainment, education, monitoring, and follow-up. However, after patients have successfully reached treatment goals, there is little data determining if these benefits are robust once patients are discharged from these specialty clinics and if appropriate follow up is in place.

The patient-aligned care team (PACT) model was developed at the San Diego VA Healthcare System in January 2011, which fosters a interdisciplinary approach. Currently, patients are referred to a pharmacist-run PACT clinic to attain cardiovascular risk goals and are subsequently discharged from the clinic back to usual care once these goals are met. However, with such intensive follow-up for a period of time, do some of these patients need more follow-up visits by the PACT to prevent failure to maintain these goals?
Methodology: The study design is a retrospective cohort chart review assessing maintenance of achieved cardiovascular risk goals after discharge from pharmacist-run PACT clinic, with a minimum of one year post-discharge data. Target values (HbA1c, LDL-C, and SBP) will be assessed at discharge from PACT pharmacy clinic and every three months thereafter. Covariates, including age, gender, marital status, tobacco use status, reason for consult, concurrent chronic diseases (i.e., diabetes, hypertension, dyslipidemia), number of medications, history of medication non-adherence, mental illness, and insulin use will be collected to evaluate if certain characteristics increases the risk of failure to maintain cardiovascular risk goal(s). Kaplan-Meier curves will be used to indicate time to failure to maintain achieved goals for HbA1c, LDL-C, and SBP. Multiple regression with Cox proportional hazard ratios will be conducted with covariates collected.

Results and Conclusion: Pending completion

ACPE #:0126-9999-13-598-L01-P

Learning Objectives:
- Describe the durability of cardiovascular risk goal attainment after successful discharge from Patient Aligned Care Team (PACT) pharmacy clinic.
- Identify if there are characteristics associated with risk of failure after successful attainment of goals.


589 - COMPARISON OF THE CAM-ICU AND THE ICDSC DELIRIUM ASSESSMENT TOOLS IN IDENTIFYING RELEVANT OUTCOMES IN THE CRITICALLY ILL

B3. Critical Care

Presented by:
Shawn Whitehead, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Executive 713

The Confusion Assessment Method in the Intensive Care Unit (CAM-ICU) is a well-validated instrument for identifying delirium in the ICU and is the standard of care at Exempla Good Samaritan Medical Center (EGSMC). The Intensive Care Delirium Screening Checklist (ICDSC) is another well-validated instrument for identifying delirium and is used in non-critical care patients for the identification of delirium at EGSMC; however it has been validated in critical care populations. The objective of this study is to compare the two screening tools and identify which tool most accurately predicts clinically relevant outcomes of delirium such as ICU and hospital mortality, length of mechanical ventilation, and duration of ICU and total hospital stay amongst critically ill patients. Adult patients (≥18 years old) admitted to the ICU for more than 24 hours will be included. Patients with a Richmond Agitation-Sedation Scale (RASS) score of -4 to -5 for more than 3 days will be excluded. Once per nursing shift, patients will be evaluated by a qualified pharmacist with both the CAM-ICU and ICDSC screening tool during the same patient interaction. Concurrent chart reviews will be conducted to record desired clinical outcomes of ICU and hospital mortality, ICU and hospital length of stay, and length of mechanical ventilation. For those patients who score positive for delirium on either or both assessment tools, the above listed outcome data will be compiled to determine ICU and hospital mortality, ICU and hospital length of stay, and length of mechanical ventilation. After data collection, the two delirium screening tools will be evaluated to determine which tool most accurately predicts clinically relevant outcomes of delirium.
Learning Objectives:
- Describe the features of both the CAM-ICU and ICDSC delirium screening tools
- Describe effect of delirium on hospital and ICU mortality, hospital and ICU length of stay, and length of mechanical ventilation


590 - INTEGRATION OF PHARMACY SERVICES INTO A CRITICAL CARE TELEMEDICINE PROGRAM
B3. Critical Care

Presented by:

RT Whiteman, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Executive 713

Introduction
The implementation of an electronic intensive care unit (eICU) is an important technological advance for healthcare. With these advances being implemented within the St. Luke’s Health-System, it becomes necessary to develop a workflow or practice model that will allow for the most effective utilization of healthcare resources. The purpose of this project is for the implementation of eICU to include protocols that bridge communication gaps between the eICU and the pharmacy department. This is achieved by, in part, the eICU staff forwarding key information they gather to pharmacy so we can assist with medication management of the patient.

Methodology
This quality improvement project primarily involves establishing collaborative relationships among health care professionals. Additionally, metrics were established to evaluate the success of a new workflow. Certain pharmacists were selected to attend computer training for the eICU software based on expertise in critical care and practice site (i.e. one critical care specialty pharmacist at each campus) in order to be able to understand the workflow process for eICU staff, which included nursing staff and intensivists. Training was then provided to the rest of the pharmacy staff based on area of practice. Workflows were developed to establish official methods of communication between pharmacy and the eICU team. Specifically, the eICU would send “alerts” through the nursing-pharmacy software, and pharmacy would be responsible for addressing the alerts in a timely manner.

To measure the usefulness of the workflow, pharmacists tracked critical care interventions that included renal-dosing adjustments and recommendations before and after eICU implementation. Data is also collected following implementation based on the number of eICU software “alerts” that the eICU nursing staff sends to the pharmacy.

Additionally, a survey to the pharmacists affected was also conducted to assess their perceptions on the workflows as well as to gauge the workload potentially created by the new process.

Results
Results are currently pending

Conclusion
The main purpose of the entire project involved establishing the connection between the eICU and the pharmacy departments. Initial collaboration will assist with further collaboration once the service expands and...
our technology evolves. The pharmacists perceived the new process as having great potential to perhaps better capture interventions for these patients in a more timely manner.

ACPE #:0126-9999-13-600-L01-P

Learning Objectives:
- Explain the purpose of telemedicine in critical care
- Describe a manner in which pharmacy may get involved with telemedicine for critical care


**591 - ELEVATED T AND B CELL AS PREDICTORS OF ANTIDEPRESSANT THERAPY IN MULTIPLE SCLEROSIS PATIENTS RECEIVING NATALIZUMAB**

A5. Neuro-Psych or Pain Management Agents

Presented by:

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*Presenting on Wednesday, May 15 at 3:00 PM in Palm III*

Introduction:
Depression has been associated with suppression of the immune system. Antidepressants, more specifically selective serotonin reuptake inhibitors [SSRIs] and serotonin norepinephrine reuptake inhibitors [SNRIs], demonstrate conflicting data regarding their effect on a patient’s immune cell counts. Natalizumab is indicated for relapsing forms of multiple sclerosis [MS]. Patients with a diagnosis of MS have an increased risk of developing depression. In addition, natalizumab is associated with a common side effect of depression, incidence of 19%, and it is recommended that patients be monitored for signs and symptoms of depression. This medication is also associated with a black box warning for Progressive Multifocal Leukoencephalopathy (PML), and as a result requires monitoring of the recipient’s immune function via T, B, NK, Stem Cell Studies lab order set which includes results for % and absolute: Lymphocytes, CD3, CD4, CD8, CD16, CD56. To our knowledge, no studies exist looking at immune function as a predictor of receiving antidepressant therapy in the multiple sclerosis population.

Study Objectives:
1. Evaluate number of patients receiving a SSRI, SNRI, monoamine oxidase inhibitors [MAO-I], tricyclic antidepressant [TCA] and/or other antidepressants along with natalizumab.
2. Determine if higher immune function, as determined by T, B, NK, and Stem Cell lab values, is correlated with likelihood of already receiving a SSRI, SNRI, MAO-I, TCA and/or other antidepressants.

Methodology:
A retrospective chart evaluation of adult patients receiving natalizumab for MS at Keck Hospital of USC was conducted. Patients whose electronic health record contained a completed medication reconciliation form and lab work were included. Demographic variables (age, gender, race), medication reconciliation, and T, B, NK, and Stem Cell Studies from lab work were collected. Exclusion criteria included age < 18, pregnancy, diagnosis of Crohn's disease or HIV, and/or chemotherapy. For objective 1, incidence of patients already receiving an antidepressant will be reported. For objective 2, statistical analysis will be conducted to detect correlation between increased immune system lab values and antidepressant therapy.

Results: To be presented following completion of study.
Conclusions: To be presented following completion of study.

ACPE #:0126-9999-13-601-L01-P

Learning Objectives:
3. Explain the need for depression screening in the multiple sclerosis population
4. Describe the impact that depression and its treatment may have on a patient’s immune system.


592 - ASSESSING THE EFFECT OF A TELEPHONE-BASED COMMUNITY PHARMACY INTERVENTION ON HERPES ZOSTER VACCINATION RATES
B2. Community Practice

Presented by:

Juliana Wilson, PharmD
Touro University/Ross Valley Community Pharmacy Residency
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Presenting on Tuesday, May 14 at 2:30 PM in Sunset V

Introduction: Approximately 1 in 3 American adults will acquire herpes zoster, or shingles, in their lifetime. Herpes zoster is a painful and debilitating condition with significant health consequences, including post herpetic neuralgia, herpes zoster ophthalmicus, and bacterial skin infection. Vaccination, which is approved by the Center for Disease Control and Prevention (CDC) for patients ≥60 years of age, is the only recommended method to prevent herpes zoster. However, according to the CDC, only 14% of eligible patients opt to receive the vaccine. Studies have shown that this may be due to barriers including cost and lack of awareness. Community pharmacists are in an ideal position to educate and recommend the herpes zoster vaccine to eligible patients, and subsequently increase vaccination rates. Several studies have shown a successful increase of pneumococcal and influenza vaccination rates with a pharmacist’s recommendation and administration. The objective of this study is to determine the effect of a community pharmacist’s telephone-based recommendation on herpes zoster vaccination rates as well as to conduct a cost-benefit analysis of this intervention.

Methodology: This is a retrospective study on a service that was implemented at Ross Valley Pharmacy, an independent pharmacy located in Larkspur, Marin County, CA. Participants were screened and identified via the electronic medical system and randomized 1:1 into two cohorts: the intervention and control groups. Subjects included 400 patients, ≥60 years old, who have received a prescription at Ross Valley Pharmacy since January 1, 2012, and have a home address on file in Marin County. Subjects were excluded if they were <60 years old, have not received a prescription at Ross Valley Pharmacy since January 1, 2012, who do not have a home address on file in Marin County, and who are hospice patients. Patients who had already received the herpes zoster vaccine at Ross Valley Pharmacy or elsewhere before the phone calls were made were also excluded. The 200 patients in the intervention group were telephoned by a pharmacist and student pharmacists through a written protocol to recommend the vaccine. The 200 patients in the control group were not called initially. After 3 months, the primary outcomes of vaccination rates were measured through Ross Valley’s computer system and through telephone call verification. Data analysis will be conducted using STATA software version 12 at the Touro University California College of Pharmacy campus in Vallejo, CA. Secondary outcomes included the cost of vaccinating the patients and the time taken to call patients. An analysis will be conducted to determine if this service is cost-beneficial in a community pharmacy setting. Results and Conclusions will be presented.
Learning Objectives:
- Describe and compare the herpes zoster vaccination rates in groups with and without a community pharmacist’s telephone-based recommendation.
- Describe whether or not implementation of a telephone-based community pharmacy herpes zoster intervention program is cost-beneficial to an independent community pharmacy.


593 - ANALYSIS OF TOTAL PARENTERAL NUTRITION (TPN) USAGE AND IMPLEMENTATION OF A PHARMACIST PRESCRIPTIVE AUTHORITY PROTOCOL
A4. Gastrointestinal Care - Gastro or Nutritional

Presented by:

**Bryce Winn, PharmD**
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*Presenting on Tuesday, May 14 at 4:00 PM in Mission Bay Foyer*

Introduction: Pharmacists at Providence Sacred Heart Medical Center (PSHMC) have been directly involved in TPN management in adults and pediatric patients for a number of years. Pharmacists are asked to manage TPN or make recommendations daily for adjustments to TPN based on analysis but do not have a standard practice. Having a protocol in place for supporting pharmacists to follow will streamline and allow the pharmacist to become more efficient in evaluating the needs of individual patients. The protocol will allow for training of pharmacists in order to maintain consistency throughout the hospital. The protocol will include the ability for a pharmacist to order bolus or intermittent doses of electrolytes which will allow for more timely correction and a more standardized TPN process.

Methodology: This project is exempt from IRB review because it is a performance improvement project. The initial part of the project included a medication utilization evaluation (MUE), in order to determine current level of pharmacist involvement in TPN dosing and potential for a protocol for pharmacist to dose TPN. The MUE looked at TPN dosing over a 3 month period for the adult population. Evaluation included an assessment of duration of use, utilization rates of standard concentration in initial TPN, change to non-standard concentrations, and assessment of electrolyte management. This analysis was done to determine baseline characteristics of TPN management at PSHMC and determine the feasibility of pharmacist prescriptive authority for TPN initiation, daily adjustments, and electrolyte replacement protocol for patients on TPN.

Results: 78 adult patients on TPN were analyzed over the 3 month period. It was found that pharmacists were directly involved with dosing of micronutrients in 93% of all TPNs. Dieticians dosed macronutrients in 91% of all TPNs. Electrolytes were changed in 72% of patients on TPN and bolus doses were given in 68% of patients on TPN. This close correlation between the percentage of time that electrolytes were changed in the TPN and a bolus dose was given lends support for a protocol allowing pharmacists to bolus electrolytes when the TPN is being managed by pharmacy. Out of 78 patients, 25 of them were on TPN for only 3 days or less. Reasons for short duration included: transition to tube feeds (36%), oral intake (36%), discharge home (20%), or patient expired (8%). Of the 5 patients that were on 3 days or less of TPN and discharged home, 4 of them were on TPN long-term at home. Protocol for pharmacist prescriptive authority to manage TPN and bolus electrolytes in
patients receiving TPN managed by pharmacy has been approved by P&T committee. Prescriptive authority protocol is currently being reviewed by the Washington State Board of Pharmacy.

Conclusion: Implementation of a prescriptive protocol for pharmacist management of TPN is expected to improve consistency amongst pharmacy staff. The expectation is also to allow staff to be more efficient in managing TPNs. Education for pharmacists will also be implemented.

ACPE #:0126-9999-13-603-L01-P

Learning Objectives:
- Identify the importance of a prescriptive authority protocol for pharmacists, enabling them to bolus electrolytes, dose, and manage TPN therapy for patients.
- Identify areas within current practice in which pharmacists are able to determine whether TPN is indicated in patients and whether or not patient can be started on a standard concentration TPN.


594 - SAFETY AND EFFICACY OF VALGANCICLOVIR FOR PREVENTION OF CYTOMEGALOVIRUS DISEASE IN MODERATE-RISK RENAL TRANSPLANT RECIPIENTS
A1. Infectious Disease - Anti-infective Agents

Presented by:

Jesse Wisniewski, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Mission Bay

Introduction:
Cytomegalovirus (CMV) is one of the most common viral pathogens in solid organ transplantation and is a significant cause of morbidity and mortality in this patient population. Valganciclovir is routinely administered after transplant as the primary means of preventing CMV disease. The FDA-approved prophylactic dose for patients at high risk of CMV disease is 900mg daily for 200 days; however doses and durations for moderate risk patients vary widely among transplant centers. To date, there is no published data evaluating the impact of valganciclovir in moderate risk (donor(D)+/recipient(R)+ or D-/R+) renal transplant recipients. This study serves to evaluate the safety and efficacy of several valganciclovir prophylactic strategies in this patient population.

Methodology:
Using retrospective chart review we identified patients who received a kidney transplant at the UC San Diego Health System from January 2008 to September 2010 to be included in a multi-center study. Patients eligible for review included adult renal transplant recipients between 18-75 years of age; sero-status of the donor/recipient pair were either D+/R+ or D-/R+; received induction therapy using antithymocyte globulin or an IL-2 receptor antagonist; and initially maintained on tacrolimus and mycophenolate. Patients were excluded if they had pre-existing infection with HIV, hepatitis B, or hepatitis C; and transplantation with more than one organ. All patients were evaluated from the time of transplant until 12 months following the transplant date. The primary efficacy endpoint was the incidence of CMV disease (viral syndrome and/or tissue invasive CMV). Secondary endpoints included CMV indirect effects (acute allograft rejection, opportunistic infections, new-onset diabetes, new-onset diabetes after transplantation, graft loss and patient death). Safety was evaluated by assessing incidence of leukopenia and thrombocytopenia.

Results and Conclusions:
ACPE #:0126-9999-13-604-L01-P

Learning Objectives:

- Explain the benefits and risks (i.e. toxicity) of using valganciclovir to prevent CMV disease in solid organ transplant recipients.
- Describe an appropriate prophylactic valganciclovir dosing regimen for renal transplant patients at moderate risk for CMV disease.


595 - ANALYSIS OF PHARMACOLOGIC TREATMENT OF PATIENTS HOSPITALIZED WITH COPD EXACERBATIONS AND COMPARISON TO GOLD GUIDELINES

B4. General Clinical Practice

Presented by:

Brianne Wolfe, PharmD
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Presenting on Wednesday, May 15 at 1:30 PM in Royal IV

Background: With a shift towards pay-for-performance reimbursements, it is imperative that hospitals focus on optimizing the treatments of all disease states, including chronic obstructive pulmonary disease (COPD) exacerbations. The goal of treatment for exacerbations is to minimize sequelae and severity of the current exacerbation as well as prevent development of subsequent exacerbations. Current estimates indicate that 23% of patients who are hospitalized for acute exacerbations of COPD will be readmitted within 30 days following hospital discharge. Despite high readmission rates, there is a paucity of information regarding the impact of adherence, or lack thereof, to GOLD guidelines and the effect this has on patients. Patients with COPD can have frequent exacerbations leading to high morbidity and mortality; however, appropriate treatment of exacerbations as well as appropriate maintenance/discharge medications may lead to decreased exacerbations and therefore fewer readmissions and lower healthcare costs.

Objectives: The primary objective of the study was to examine how patients with acute exacerbation of COPD are currently being treated at St. Joseph’s Hospital and Medical Center in comparison to the GOLD guidelines and its relationship to 30-day readmission rates. Secondary endpoints of the study included: 1) examining whether or not COPD exacerbation treatment according to GOLD guidelines had an effect on length of stay, 2) observing whether or not appropriate discharge medications were prescribed in patients readmitted within 30 days for a repeat COPD exacerbation, and 3) determining whether pulmonologists had an effect on 30 day readmission rates.

Methods: All patients admitted to St. Joseph’s Hospital and Medical Center from October 1, 2011 until March 31, 2012 with a diagnosis of COPD exacerbation were studied. Data collected included demographics, presence of concomitant diagnoses, and length of hospital stay. It was also noted if patients were readmitted to St. Joseph’s Hospital and Medical Center within 30 days of discharge for repeat acute exacerbations of COPD. Treatments were identified by examining if the patient was screened for pneumococcal and influenza vaccines, received appropriate oxygen therapy, as well as use of bronchodilators, corticosteroids, and antibiotics. Patients who were readmitted multiple times over the study period had their initial visit assessed for appropriateness of treatment and each subsequent readmission was counted if COPD was a contributing factor. Discharge
summaries were examined to look for the presence of bronchodilators, corticosteroids and antibiotics if necessary based on length of stay.

Results and Conclusions: Results and conclusions will be presented.

ACPE #:0126-9999-13-605-L01-P
Learning Objectives:
- List factors contributing to 30-day readmission rates of patients presenting with COPD exacerbations.
- Describe appropriate treatment for exacerbations and maintenance therapies of COPD based on the most recent GOLD guidelines.


596 - EVALUATING THE IMPACT OF A CLINICAL PHARMACIST ON DIABETES, HYPERTENSION, AND DYSLIPIDEMIA IN A RURAL CLINIC
B1. Ambulatory Care

Presented by:
May Wong, PharmD
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Presenting on Wednesday, May 15 at 3:30 PM in Royal V

Rural residents are at higher risk for chronic diseases and complications arising from hypertension, diabetes, and dyslipidemia. Several factors such as older age, lower socioeconomic status, and less access to health care facilities due to distance are associated with these rural health disparities.

In an effort to reduce these barriers and increase health care access to rural residents, utilization of technology by health care professionals has been tried in a number of different scenarios, including phone-based clinics or remote monitoring. The San Francisco Veteran Affairs Medical Center recently opened a Community Based Outpatient Clinic (CBOC) in Clearlake in order to serve the rural residents of Lake County in Northern California. Lake County is considered 100% rural and is a largely agricultural industry. In order to best utilize health care resources and with funding from the Rural Health Initiative, a clinical pharmacist was added to the team in October 2011 to help manage chronic diseases remotely. The pharmacist is based at VA San Francisco and is in charge of managing the patients via telephone encounters. The purpose of this study is to evaluate the impact of a clinical pharmacist in remotely managing diabetes, hypertension, and dyslipidemia in an effort to improve health outcomes for rural patients. A retrospective chart review of patients who were referred to and consulted with the clinical pharmacist for chronic disease management between October 1, 2011 and January 31, 2013 at the Clearlake Community Based Outpatient Clinic (CBOC) will be conducted.

The HbA1c, blood pressure, and low density lipoprotein cholesterol (LDL-C) prior to consultation with clinical pharmacist will be compared to those obtained throughout the study period. The percentage of patients that achieve their goal HbA1c, blood pressure, or LDL-C as determined by the Primary Care Provider, the incidences of medication adverse effects during the study period, and the workload of this model will also be determined. Results and conclusions will be presented.

ACPE #:0126-9999-13-606-L01-P
Learning Objectives:
Explain the impact of a clinical pharmacist on improving glycemic control, blood pressure, and cholesterol.
Describe a novel practice model involving remote interdisciplinary collaboration and its clinical results at SFVAMC.


597 - IMPLEMENTATION AND EVALUATION OF 30 DAY SUPPLY DISPENSING IN A RURAL PHARMACY
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
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Presenting on Wednesday, May 15 at 4:00 PM in Sunset IV

Title: Implementation and evaluation of 30 day supply dispensing in a rural pharmacy
Introduction: Crownpoint Service Unit is looking to improve medication adherence and contain costs at its satellite pharmacy clinic at Thoreau, New Mexico. The objective of this study is to implement a 30 day supply limitation at Thoreau Health Station and to evaluate the impact on medication adherence and revenue.
Methodology: Patients with a Post Office box at Thoreau, New Mexico, Continental Divide, New Mexico, or Prewitt, New Mexico and are enrolled in one of the following health insurance plans, Amerigroup of New Mexico, Caremark, Catalyst Rx, Express Scripts, Medco Paid Prescription, Medco Health Solutions, Merck Medco, United Drug, Walgreens Health Initiatives, Wellpoint-D, Rx America, or Evercare Medicaid, will be limited to 30 day supply of medications. A pharmacist will screen patient charts and dispense a 30 day supply of medications to patients who meet the criteria. Data will be collected prospectively for six months starting September 11th, 2012, and eleven months retrospectively. Drug revenue reports will be generated each month and evaluated for impact on revenue. The electronic health record will be used to evaluate medication adherence based on patient refill history.
Results and Conclusion: The findings of this study will be presented after completion.
Presentation Objectives:
1. Describe the impact of a 30 day supply limitation on medication adherence.
2. Explain the impact of 30 day supply dispensing in a rural pharmacy on revenue generation.
Presentation Keywords: rural, medication adherence, revenue, finance, dispensing
IRB Status: Not needed

ACPE #:0126-9999-13-607-L01-P
Learning Objectives:
1. Describe the impact of a 30 day supply limitation on medication adherence.
2. Explain the impact of 30 day supply dispensing in a rural pharmacy on revenue generation.

598 - EVALUATING THE EFFECTIVENESS OF PROPHYLACTIC COLCHICINE ONCE VERSUS TWICE DAILY DOSING DURING ALLOPURINOL INITIATION.

B1. Ambulatory Care

Presented by:

Jordan Wong, PharmD
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Presenting on Wednesday, May 15 at 5:00 PM in Royal IV

Introduction:
Gout is one of the most common rheumatic diseases affecting adult Americans. Undersecretion or overproduction of uric acid leads to excessive buildup in the body, resulting in the wide spectrum of clinical and pathological manifestations of gout. Management of gout usually consists of analgesics and anti-inflammatory agents for acute gout flares, while urate lowering therapy (ULT) is given for preventing future attacks. During the initiation of ULT, such as with allopurinol, prophylactic colchicine is usually given as there is an associated increase in frequency of acute gout flares during this time. This retrospective study addresses whether colchicine taken once daily is effective as colchicine twice daily for prophylaxis of acute gout flares during allopurinol initiation. A secondary outcome is looking at the incidence of adverse drug events occurring, between colchicine daily and twice daily dosing.

Methodology:
Using an electronic pharmacy database, eligible study subjects will be identified from the period of January 2011 – September 2012, who are greater than 18 years of age, have a diagnosis of gout in the electronic health record, and have been seen by either a Kaiser Permanente San Francisco primary care provider or rheumatologist. Exclusion criteria include patients with severe renal dysfunction, documented hepatic disease, diagnosis of alcohol abuse/dependence, documented memory deficits, and end of life care. The sub-investigator will do a retrospective chart review starting from the date of allopurinol initiation to six months after to identify any episodes of acute gout flares and adverse drug events. An investigator developed patient phone questionnaire will also be administered to study subjects to gather pertinent subjective information, including social history, OTC medications, any undocumented incidences of acute gout flares and adverse drug events.

Results and Conclusions:
Results and conclusions are pending at this time but will be presented and further elaborated upon in the final presentation.

ACPE #:0126-9999-13-608-L01-P
Learning Objectives:
- Describe the trend of acute gouty flares in patients on daily and twice daily prophylactic colchicine therapy.
- Explain why prophylactic colchicine is initiated during urate lowering therapy.


599 - THE “FLIPPED” TEACHING METHOD: AN ANALYSIS OF ACADEMIC OUTCOMES AND A SURVEY OF STUDENT PERCEPTIONS

C1. Pharmacoeconomics, Admin or Financial Mgmt
Presented by:

Terri Wong, PharmD
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Presenting on Wednesday, May 15 at 4:30 PM in Sunset IV

INTRODUCTION: As the profession of pharmacy is becoming more clinical and patient-centered, the Accreditation Council for Pharmacy Education (ACPE) Accreditation Guidelines and pharmacy school curricula have become increasingly focused on teaching methods that increase communication, critical thinking, and problem-solving skills. Traditional teaching methods have relied heavily on professors delivering lectures, with students passively absorbing material for a majority of the class period. The “flipped” teaching method is an innovative teaching method whereby lectures, traditionally given in-class, are offered in various forms outside of the classroom to be completed prior to class, while actual class time is dedicated to application and discussion of lecture materials through interactive case-based exercises. At Touro University California College of Pharmacy (TUCOP) the “flipped” teaching method was piloted as a 3-class series (basic sciences, pharmaceutics, and therapeutics courses) for first year pharmacy students on the topic of cardiac arrhythmias in Spring 2012. The purpose of the study is to 1) assess the effectiveness of the “flipped” teaching method on academic performance by comparing the exam scores of students receiving the “flipped” teaching method to exam scores of students receiving the traditional teaching method and 2) to assess the perceived value of the “flipped” teaching method by surveying student feedback.

METHODOLOGY: A group of 101 first year students (the “flipped” cohort), enrolled at TUCOP during the Spring 2012 semester, participated in the “flipped” 3-class pilot on cardiac arrhythmias. Students in the “flipped” cohort were supplied pre-recorded lectures and web-based learning materials ≥4 days prior to class with the expectation of learning the material before class. Each “flipped” class began with a brief question-and-answer session for clarification of lecture material and proceeded with active learning exercises/cases that took place for a majority of the class period. Students then took a cumulative semester final examination that included questions on cardiac arrhythmias. To determine the effectiveness of the “flipped” teaching method, cardiac arrhythmia exam scores from students in the 2012 “flipped” cohort will be compared to exam scores from the 105 students in the 2011 control cohort who received the traditional teaching method. The baseline grade-point-average of the students in both groups will also be analyzed.

To assess the perceived value of the “flipped” teaching method, the “flipped” cohort was given a voluntary, anonymous web-based survey consisting of 15 questions assessing the amount of time students devoted to self-studying materials prior to class and their feedback regarding the effectiveness of the flipped teaching method.

RESULTS & CONCLUSION: (In progress at the time of abstract submission. Final results will be presented and discussed.)

ACPE #:0126-9999-13-609-L01-P
Learning Objectives:

Describe the “flipped” teaching method and how it differs from the traditional teaching model.
Compare the academic performance of pharmacy students taught via the “flipped” teaching method to pharmacy students taught by the traditional method.

**600 - PROTON PUMP INHIBITOR PRESCRIBING TRENDS IN THE ICU**

**B3. Critical Care**

Presented by:

**Tiffany Wong, PharmD**

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*Presenting on Tuesday, May 14 at 8:30 AM in Executive 713*

Introduction: Proton pump inhibitors (PPIs) are one of the most prescribed classes of medications and are commonly used in the inpatient setting for stress ulcer prophylaxis. Various studies have shown up to 60% of patients are prescribed PPIs in hospital without a clear indication for their use. The use of PPIs has come under scrutiny since the FDA issued a warning that PPI therapy may predispose patients to *Clostridium difficile* infections. At Stanford Hospital & Clinics (SHC), a large academic teaching hospital, there has yet to be an analysis on the appropriate use of proton pump inhibitors and histamine receptor blockers in ICU patients and how therapy may be inappropriately continued on to the medicine floor. In addition, there is growing interest in assessing how including proton pump inhibitors or histamine receptor blockers on admission or post-operative order sets influences the likelihood of inappropriate prescribing.

Methods: The purpose of this project is to assess the appropriateness of PPI prescribing from 4 ICU medical teams at SHC. A retrospective analysis will be performed on the following 4 ICU teams including medical ICU (MICU), surgical ICU (SICU), cardiovascular ICU (CV ICU), and neurosurgery ICU. Over 200 patients whose primary team included any of the 4 ICU teams beginning March, 1st 2012 will be assessed for appropriate PPI use. The criteria for appropriate use will be determined by the FDA approved indications for PPIs as well as the ASHP Therapeutic Guidelines on Stress Ulcer Prophylaxis published in the American Journal of Health-System Pharmacy in 1999. In addition, the patient charts will be assessed for appropriate use of PPIs upon transfer to the medicine floor, discharge home, or discharge to a nursing facility.

Results/Conclusion: Results and conclusions will be presented once data has been collected and analyzed.

ACPE #:0126-9999-13-610-L01-P

Learning Objectives:

- List the appropriate indications for stress ulcer prophylaxis in the ICU
- Describe the use of proton pump inhibitors at a large academic teaching hospital


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**601 - EVALUATION OF HIGH RISK MEDICATION USE IN THE ELDERLY**

**B5. Long-Term, Geriatric or Hospice Care**

Presented by:

**Alison Wong, PharmD**

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*Presenting on Tuesday, May 14 at 3:00 PM in Sunset IV*
Certain medications have an increased risk of drug side effects and toxicity in the elderly population. One of the clinical quality measures that Centers for Medicare and Medicaid Services (CMS) uses to track the quality of healthcare services is the measurement of the percentage of elderly patients who are taking high risk medications. These high risk medications have been identified in the current Healthcare Effectiveness and Data Information Set (HEDIS) by the National Committee for Quality Assurance (NCQA). Their use should generally be avoided in patients 66 years or older and a safer alternative should be used instead. Reviewing the use of high risk medications in the geriatric population is very important for patient safety. This information can help in the decrease of use of these medications, improve patient safety, and to develop a tool to assess medication safety risk.

The objectives of this study are to: (1) assess the percentage of patients 66 years and older who received at least one high-risk medication (2) develop a medication safety assessment scale based on high-risk medication use data to help in the identification of potential clinical pharmacist interventions in the geriatric population. This study is a retrospective chart review of patients who are 66 years and older who were discharged from the hospital. The following data elements are being collected: patient demographics, name and class of the medication used, duration of high risk medication use, timing of when high risk medication use was prescribed, and adverse events experienced (if any). A summary of the data collected will be presented and the implications of the development of a medication safety assessment tool based on the use of high risk medications in the elderly to help in the improvement of medication safety will be discussed.

ACPE #:0126-9999-13-611-L05-P
Learning Objectives:
   List high-risk medications that should be avoided for use in the elderly (patients 66 years of age and older).
   Describe the role of clinical pharmacist interventions in helping reduce high-risk medication use in the elderly.


602 - BOCEPREVIR- OR TELAPREVIR-BASED TRIPLE THERAPY IN PHARMACIST-MANAGED CHRONIC HEPATITIS C CLINICS VERSUS USUAL CARE
B1. Ambulatory Care

Presented by:
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Presenting on Wednesday, May 15 at 4:30 PM in Royal V

Introduction: The American Association for the Study of Liver Diseases (AASLD) 2011 Practice Guideline Update recommends the use of triple therapy with a NS3/4A serine protease inhibitor (PI) boceprevir (BOC) or telaprevir (TVR) with peginterferon alpha and weight-based ribavirin (PR) for the optimal treatment of genotype 1, chronic hepatitis C virus (HCV) infection. The goal of HCV treatment is to attain a sustained virologic response (SVR) defined as an undetectable HCV RNA level 24 weeks after the completion of therapy. Treatment-naïve patients, without cirrhosis, who rapidly clear HCV may receive a shortened duration of therapy per response-guided therapy (RGT) guidelines as follows:
Boceprevir: PR and BOC should be administered for 24 weeks following an initial 4 week lead-in phase with PR if the HCV RNA level becomes undetectable at treatment week (TW) 8 with no evidence of viral breakthrough. If the HCV RNA is detectable, PR and BOC are continued for an additional 8 weeks to TW36 followed by PR for 12 weeks to TW48 provided that treatment futility—HCV RNA ≥100 IU/ml at TW12 or detectable at any level at TW24 or beyond—has not been reached.

Telaprevir: PR and TVR are administered for 12 weeks followed by PR only for 12 weeks if an extended rapid virologic response (eRVR)—undetectable HCV RNA levels at TW4 and TW12—is achieved. Patients who do not achieve an eRVR but do not meet treatment futility criteria—HCV RNA >1000 IU/ml at TW4 or TW12 or detectable at any level at TW24 or beyond—continue PR for an additional 36 weeks to TW48.

Methodology: A retrospective chart review was performed on Kaiser Permanente Northern California (KPNC) patients who started BOC or TVR from May 2011 to November 2012. The primary endpoints are (1) 12-week treatment duration of TVR per FDA approval and (2) 4-week PR lead-in period with BOC. Secondary endpoints include (1) shortened duration of therapy per RGT for treatment naive non-cirrhotics as defined by FDA approval and AASLD guideline and (2) frequency of missing labs at TW8 and TW4 for BOC and TVR, respectively, for determining RGT eligibility. Inappropriate use of PIs may result in an unnecessary prolongation of therapy, additional exposure to drug toxicities, increased cost and the potential emergence of resistance-associated variants.

All patients receiving triple therapy within the study period were included for the primary endpoint analysis. The patient cohort used for the analysis of secondary endpoints excluded patients with prior HCV treatment, liver cirrhosis, liver transplant, HIV co-infection, and treatment initiation after May 2012. The guideline concordance of protease inhibitors use in pharmacist-managed clinics is compared to those clinics with usual care.

Results: To be presented.

ACPE #:0126-9999-13-612-L01-P

Learning Objectives:
- List the guideline-based criteria for response-guided therapy with boceprevir and telaprevir
- Describe examples of inappropriate protease inhibitor use


**603 - IMPLEMENTATION AND EVALUATION OF A PHARMACIST-RUN EMPLOYEE WELLNESS CLINIC IN A SELF-INSURED HEALTH SYSTEM**

B1. Ambulatory Care

Presented by:

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Presenting on Wednesday, May 15 at 4:00 PM in Royal V

Introduction: The role of the pharmacist in providing medication therapy management (MTM) services to patients through the performance of patient and medication-focused interventions has become increasingly important, especially due to the growing number of patients who are placed on multiple medications and complex medication regimens. The purpose of this study is to evaluate the impact of a pharmacist-run employee wellness clinic as demonstrated by MTM services, which includes identification and resolution of drug-related problems, cost-savings, and evaluation of patient medication adherence and literacy.
Methods: The current study is a single-center, prospective study. Patients included in the study are current employees of Cedars-Sinai Medical Center (CSMC) who fill their prescriptions at the Ambulatory Care Pharmacy at CSMC. Screening of patients will be performed during the prescription filling process and employees with five or more chronic medications will be contacted for voluntary participation in the wellness clinic. At each face-to-face initial wellness clinic visit, the pharmacist will perform a comprehensive medication regimen review, provide disease state and medication education, implement clinical and cost-saving interventions, evaluate baseline medication adherence and literacy, and provide a detailed, patient-friendly personal medication record for each patient. Follow-up visits will be performed one month after the initial visit to evaluate medication adherence and literacy in comparison to baseline, communicate any physician approved recommendations, and evaluate patient acceptance of recommendations made during the initial visit. Primary endpoints will include the quantity, type (i.e. therapeutic duplication, inappropriate dosing, cost-saving alternatives, resolution of adverse drug reactions, drug-drug, drug-nutrient, and drug-disease interactions) and severity (as categorized by a modified NCC MERP index) of drug-related problems identified per patient, as well as the percent of resolved drug-related problems per patient and the reduction in medication cost per patient. Secondary outcomes will include the evaluation of patient medication adherence using the Morisky scale and medication literacy using the teach back method at the initial and one-month follow-up visits.

Results and Conclusions: The findings of this study will be presented upon completion of data collection and analysis.

ACPE #:0126-9999-13-613-L01-P

Learning Objectives:
- Explain the benefits of a pharmacist-run employee wellness clinic service in a self-insured health system.
- Describe the patient-specific benefits through MTM participation.


604 - A RETROSPECTIVE EVALUATION OF THE APPROPRIATE USE OF MEROPENEM AT THE NAVAL MEDICAL CENTER SAN DIEGO

A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 5:00 PM in Mission Bay

Introduction:
As the resistance of numerous organisms continues to rise, the need for antibiotic stewardship programs (ASPs) is evident. With a scarcity in antibiotic development and the inappropriate use of antibiotics, the development of multidrug resistant organisms with limited antibiotic treatment options has become an epidemic public concern. The development of ASPs has demonstrated a benefit in reducing resistance rates in several antibiotic resistant microbes. Restricting the use of broad-spectrum antibiotics such as carbapenems can limit the resistance rates observed with this class of antibiotics. Our analysis of the appropriate use of meropenem at the Naval Medical Center San Diego (NMCSD) will be the first step in the development of an ASP. The primary objective of this study is to analyze the appropriate use of meropenem at NMCSD, specifically for the treatment of pneumonia and urinary tract infections (UTIs). Elements that will be evaluated include previous
history of Pseudomonas and ESBL (extended spectrum beta lactamase) infections, culture and sensitivity reports, and if antibiotics were switched. The outcomes of this study may illustrate how pharmacists can play a key role in the development and implementation of an ASP to assess the appropriateness of broad-spectrum antibiotics and reduce resistance rates.

Methodology:
This retrospective review will be performed at NMCSD from January 1, 2010 to September 30, 2012. An electronic report will be generated to identify the patients. An inpatient electronic charting database will be used to collect patient data. Patients will be included if they were treated with the antibiotic, Meropenem, for pneumonia or a UTI. Patients will be excluded if they are <18 years of age, pregnant, or were treated for another indication besides pneumonia or UTI. Examples of other parameters that will be collected include sex, age, co-morbidities, and previous history of Pseudomonas and ESBL infections. Since there is limited data on the appropriateness or actual rate of Meropenem use, no power analysis can be performed. Therefore, we proposed a total of 200 randomized patients to be used as an adequate estimate for this study.

Results and Conclusions: Pending

ACPE #:0126-9999-13-614-L01-P
Learning Objectives:
- Describe the appropriate use of Meropenem for the treatment of pneumonia and urinary tract infections
- Explain the need for an antibiotic stewardship program at NMCSD


605 - EVALUATION OF ALLOPURINOL PRESCRIBING AFTER IMPLEMENTATION OF AN UPDATED GOUT ORDER SET

D1. Medication Safety

Presented by:

Marisa Yamashita, PharmD
VA Puget Sound Health Care System
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Presenting on Wednesday, May 15 at 5:00 PM in Palm I

Introduction:
The American College of Rheumatology (ACR) published guidelines for best practice gout management in October 2012. The guidelines address nonpharmacologic and pharmacologic treatment approaches to hyperuricemia, as well as therapy and anti-inflammatory prophylaxis of acute gouty arthritis. One of the landmark changes highlighted in the guidelines is changes to allopurinol dosing recommendations. Based on expert consensus, the ACR recommends a gradual titration of allopurinol every 2 to 5 weeks and advises that allopurinol dosing can be raised above 300mg/day in renal impairment. Currently, common practice at the Veterans Affairs Puget Sound Health Care System (VAPSHCS) is to start allopurinol 100mg/day and titrate weekly to uric acid goal (maximum 800mg/day, dose adjusted for renal dysfunction). To guide evidence based prescribing, the VAPSHCS recently updated the gout order set to reflect ACR’s allopurinol dose changes. The primary goal of this medication use evaluation is to evaluate current allopurinol prescribing patterns at the VAPSHCS to ensure patient safety and appropriate management of gout amongst our veteran population.

Methodology:
Electronic medical records will be reviewed for patients with a gout diagnosis and examined for first fills of allopurinol (initial dose, titration schedule), uric acid levels, serum creatinine, and charted allopurinol adverse drug reactions (ADRs). Veterans initiated on allopurinol for gout management at the VAPSHCS will be included in this study. Veterans with a non-gout indication for allopurinol will be excluded. Primary care and arthritis providers at Seattle and American Lake divisions will also be educated on the recommendations published in the 2012 ACR guidelines and informed of the changes to the gout order set. Study design: single-center, retrospective, observational chart review of veterans enrolled in the VAPSHCS, Seattle and American Lake Division Primary Care Clinic / Arthritis Clinic. Results / Conclusion: The findings of this study will be presented after completion.

ACPE #:0126-9999-13-615-L01-P
Learning Objectives:
- Describe the changes to allopurinol dosing recommended by the American College of Rheumatology.
- Describe the impact of a new order set on gout management prescribing patterns at the VA Puget Sound Health Care System.


606 - COMPARISON OF THE INCIDENCE AND SEVERITY OF HYPERSENSITIVITY REACTIONS TO INTRAMUSCULAR INJECTION AND INTRAVENOUS ADMINISTRATION OF PEGASPARAGASE IN PEDIATRIC ONCOLOGY PATIENTS
A2. Oncology - Anti-neoplastic and Non-anti-neoplastic

Presented by:
Shirley Qiong Yan, PharmD
Children's Hospital of Orange County
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Presenting on Wednesday, May 15 at 5:00 PM in Sunset I

BACKGROUND: Escherichia coli asparaginase (E. coli ASP) is an important component in the treatment regimen for childhood acute lymphoblastic leukemia (ALL). However, as with all asparaginase preparations, there is a risk of hypersensitive reactions that may limit its safety and efficacy due to immune response to foreign protein. Hypersensitivity reactions occur when the patient forms antibodies against the E. coli ASP preparation. Patients who develop hypersensitivity to asparaginase preparations are at increased risk of developing subsequent hypersensitivity reactions. Pegaspargase (PEG) is polyethylene glycol-L-asparaginase and until recently, the IM route has been used exclusively for PEG and E. coli ASP in COG trials. Despite attaching polyethylene glycol to E. coli ASP to reduce immune response, hypersensitivity reactions to PEG still occur and can be severe in many children. Patients who received multiple or repeated doses of E. coli ASP may have an increased risk of hypersensitivity reactions with subsequent doses. Recently, some studies have shown that PEG can be safely administered by the IV route, a less painful and more convenient option than IM injection. However, one group demonstrated that hypersensitivity reactions were observed in 9% of newly diagnosed pediatric ALL patients receiving IM PEG and 36% receiving IV PEG. The study is limited by the fact that the IV PEG group contained significantly less patients compared to the IM Peg group (11 vs. 186). The primary aim of my study is to compare the incidence of hypersensitivity reactions to PEG administered IV versus IM. The secondary aim is to compare the severity of the hypersensitivity reactions to PEG when administered IV versus IM based on the National Cancer Institute (NCI)
Toxicity Criteria for Allergic Reactions and Anaphylaxis (CTCAE) v4.0 grading scale and to evaluate if there are subgroups of patients who may be more prone to hypersensitivity reactions to PEG.

**METHOD:** This is a retrospective study utilizing clinical data available from the routine drug monitoring of PEG in children on the Oncology Service or at the Outpatient Infusion Center at Children’s Hospital of Orange County between January 2004 and January 2013. Patients were eligible to be included in the analysis if they were less than 18 years of age, met protocol specific eligibility to receive either IV or IM PEG as one of their multi-agent chemotherapy, and received the drug after 2004. Based on the 27% difference in the incidence of hypersensitivity reactions reported by one study, a power of 80% and a type 1 error of 0.05, 43 patients will be required in each group. We plan to enroll 45 patients in each group. We will apply proportional statistical analysis to determine whether the incidence of hypersensitivity reactions to PEG administered IV is greater than IM. A two tailed t-test will be performed to detect any significant difference in the severity of the hypersensitivity reactions between the two groups.

**RESULTS/CONCLUSION:** Results and conclusion will be presented.

ACPE #:0126-9999-13-616-L01-P

**Learning Objectives:**
- Describe the rationale for using different routes of administration for PEG.
- Describe the incidence and severity of hypersensitivity reactions to PEG administered IV versus IM and potential factors which may contribute to the difference.


**607 - THE COMPARISON OF INTRAVENOUS METOPROLOL AND INTRAVENOUS DILTIAZEM FOR THE TREATMENT OF SUPRAVENTRICULAR TACHYCARDIA IN ACUTE CARE PATIENTS**

**A3. Cardiovascular Care - Cardiovascular Agents**

Presented by:

**Jennifer Yang, PharmD**

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**Presenting on Wednesday, May 15 at 1:30 PM in Royal V**

**Introduction:**
Supraventricular tachycardia (SVT) includes a wide variety of tachyarrhythmias characterized by rapid impulse formation originating from atrial or atrioventricular (AV) junctional tissue. Acute treatment of symptomatic SVT in stable patients requires rate control with longer-acting AV nodal blocking agents if treatment with vagal stimulation and adenosine fails. The recommended agents for rate control include non-dihydropyridine calcium channel blockers, such as diltiazem, and beta-blockers, such as metoprolol. While studies have shown intravenous diltiazem and metoprolol to be effective agents for treating SVT, there is currently limited data directly comparing the effectiveness of these two agents for the treatment of SVT. Currently, an established algorithm does not guide treatment of SVT at Harborview Medical Center (HMC).

**Objectives:**
The primary objective of this study is to compare the clinical outcomes of intravenous diltiazem versus intravenous metoprolol for the treatment of SVT in the acute care setting. The secondary objective is to identify
current pharmacologic treatment patterns of SVT at HMC. The study findings will contribute to the future goal of developing and implementing an algorithm to optimize treatment of SVT.

Methods:
This investigation is a retrospective, comparative study that will be conducted through a medical chart review of patients treated for SVT in the acute care setting from January 1st, 2008 through October 31st, 2012 at HMC. Data collected will be analyzed to evaluate and compare the effectiveness and safety of intravenous diltiazem versus intravenous metoprolol within the first 24 hours after drug administration. The primary endpoint is successful treatment at four hours after drug administration, which is defined as heart rate control or termination of symptoms. Heart rate control is defined as heart rate less than 120 beats per minute. The secondary endpoints are heart rate control at 24 hours and adverse events including hypotension, chest pain, and shortness of breath. Subgroup analysis will be performed to elucidate possible associations between intravenous metoprolol or intravenous diltiazem and better clinical outcomes in subsets of patients with co-morbidities. Current pharmacologic treatment patterns of SVT will also be examined.

Results/ Conclusion: The results and conclusion of this study are currently pending.

ACPE #:0126-9999-13-617-L01-P

Learning Objectives:
- Describe the pharmacologic agents used for the treatment of supraventricular tachycardia.
- Explain if and how the treatment of supraventricular tachycardia can be guided and optimized by the data collected from this study.


608 - THE IMPACT OF SHORT ACTING BETA-AGONISTS IN PATIENTS WITH A DIAGNOSIS OF CONGESTIVE HEART FAILURE (CHF)
A3. Cardiovascular Care - Cardiovascular Agents

Presented by:
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Presenting on Tuesday, May 14 at 2:30 PM in Royal V

Shortness of breath (SOB) is a common symptom that coincides with many etiologies including congestive heart failure (CHF), asthma, and chronic obstructive pulmonary disease (COPD). While short acting, beta-agonist (SABA) inhalers can be useful in relieving SOB in asthma and COPD, their safety and efficacy are limited in CHF. The use of SABA inhalers for pulmonary diseases may be associated with a subsequent delay in the diagnosis of CHF. Many studies have looked at the association between inhaled SABAs and adverse outcomes. However, the appropriateness of their use remains unclear in a population of heart failure patients with purely left ventricular systolic dysfunction and without a history of co-existing causes of pulmonary dysfunction where SABA inhalers may provide benefit.

To gain a better understanding of the delay in CHF diagnosis in those patients presenting with SOB, we assembled a cohort of patients within Kaiser Permanente Northern California with no prior history of asthma, COPD, or CHF who presented with SOB to the emergency department or another ambulatory care setting as their index visit between July 1, 2007 to June 30, 2009. We then conducted a longitudinal cohort study to assess the primary outcome, defined as the difference in the amount of inhaled SABA use amongst patients who
ultimately became diagnosed with CHF compared to patients who were not diagnosed with CHF one year post index visit. Secondary outcomes of the study include the utilization of health care resources (composite of hospitalizations, ambulatory care and emergency department visits) up to three months after diagnosis of CHF and death up to one year after diagnosis of CHF between the two groups. Potential predictors of these outcomes include demographic and clinical characteristics. Statistical analysis will be completed using the chi square for proportions or t-test for continuous variables. A multivariable regression model will be used to obtain a risk ratio of the primary and secondary endpoints. Findings will help to determine if patients with SOB and subsequent left ventricular dysfunction had a disproportionate use of inhaled SABA and whether utilization of health care resources and incidence of mortality varied based on this differential use. The results of this study will thereby elucidate appropriateness of inhaled SABA use in undiagnosed CHF patients who present with SOB. Results and conclusions will be presented.

ACPE #:0126-9999-13-618-L01-P
Learning Objectives:
- Explain the association between SABA inhaler usage and subsequent CHF diagnosis.
- Describe the utilization of health care resources and incidence of death amongst patients who were inappropriately exposed to SABA inhaler after SOB presentation to the ED or ambulatory care setting.


609 - PHARMACIST-MANAGED CLOSTRIDIUM DIFFICILE INFECTION PILOT PROGRAM

A1. Infectious Disease - Anti-infective Agents

Presented by:

Justin Yee, PharmD
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Presenting on Wednesday, May 15 at 4:00 PM in Palm II

Pharmacist-Managed Clostridium difficile Infection Pilot Program

BACKGROUND: Clostridium difficile infections (CDIs) continue to contribute to patient morbidity and mortality in hospitals across the country. The CDC estimates 14,000 deaths were caused by CDIs in 2011 with 94% of cases associated with medical care. Many institutions have developed methods to isolate and treat these infections such as standardized treatment protocols, infectious disease consults, and infection control parameters. A review of current practice for treating CDIs at St. Joseph Medical Center reveals many opportunities for improvement such as management according to Infectious Disease Society of America (IDSA) guidelines. Inappropriate treatment such as initiating drug therapy in the absence of clinical symptoms, using incorrect dosing regimens, and failing to complete recommended regimen durations are commonly observed deficiencies.

OBJECTIVE: To assess the benefit of utilizing a pharmacist to assist prescribers in the appropriate management of CDIs according to IDSA guidelines as well as to increase awareness of antibiotic use and risk of developing a CDI. Specific elements that will be evaluated are adherence to guidelines when a pharmacist versus a prescriber manages treatment, discontinuation of treatment upon receiving a negative PCR result, readmissions due to CDIs, and prescriber acceptance to pharmacist recommendations.

STUDY DESIGN: This is a pilot program comparing prospective data with data from a retrospective cohort.
METHODS: An audit of the number of CDI’s from January 2012 to November 2012 revealed a total of 174 cases at our institution. A detailed proposal complete with treatment algorithms, patient monitoring sheet, and chart documentation was presented and approved by administrators representing prescribers, pharmacy, and infection control. The pilot went live between January 1, 2013 and March 30, 2013 during which time a dedicated pharmacist was responsible for carrying out all steps. First, TheraDoc data-mining software was used to seek out patients who either were empirically started on treatment or who had confirmed infections needing antibiotic treatment. The pharmacist would then review each patient’s chart to determine severity of infection, search for inappropriate medications such as anti-diarrheal agents, and gauge infection recurrence if applicable. The pharmacist subsequently contacted the patient’s prescriber with recommendations and inquired if they would have liked the pharmacist to manage the infection. Pharmacist management was limited to mild-to-moderate and severe uncomplicated CDI cases. All were re-evaluated on a daily basis according to severity criteria and any therapy adjustments were made known to the patient’s prescriber.

RESULTS AND CONCLUSIONS: The findings of this study will be presented after completion.

Learning Objectives
1. Evaluate a pharmacist’s impact on improving adherence to IDSA guidelines and affect on CDI treatment outcomes.
2. Recognize the importance of reminding providers about the increased risks of developing a CDI associated with antibiotic use.

ACPE #:0126-9999-13-619-L01-P

Learning Objectives:
- List IDSA recommended antibiotic regimens for mild-to-moderate, severe uncomplicated, and severe complicated CDIs.
- List 3 antibiotics that can be commonly associated with increased risk of developing CDI.


610 - HEPARIN USE DURING CARDIAC CATHETERIZATION AND INCIDENCE OF DECREASED PEDAL PULSES IN PEDIATRIC PATIENTS

A3. Cardiovascular Care - Cardiovascular Agents

Presented by:

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Presenting on Wednesday, May 15 at 2:30 PM in Royal V

INTRODUCTION: Cardiac catheterization (CC) is often essential in diagnosing and treating certain heart conditions, especially in infants and children. Despite decreases in morbidity due to advances in technology in surgical care, vascular complications are still of concern, with thrombotic events at the site of vascular access being the most common in children. The incidence of thrombotic events (TE) associated with CC in children ranges from 0.8 to 40% for arterial thrombosis and 0 to 20% for venous thrombosis. The American Heart Association guidelines recommends administering 100-150 units/kg of IV unfractionated heparin (UFH) for thromboprophylaxis in neonates and children in CC via an artery, with further doses of UFH for prolonged procedures. However, there is little consensus on what constitutes adequate anticoagulation, how best to monitor its effectiveness, and which patients would benefit most from continued prophylaxis. At CHOC
Children’s, various prophylactic heparin protocols are used during a CC procedure. It is unknown if these practice variations affect patient outcomes, specifically decreased pedal pulses (DPP) and thromboembolisms post-CC. Palpation of the pedal pulses is a useful and noninvasive way to accurately assess femoral artery patency and monitor for potential thromboembolic complications post CC. METHODOLOGY: This retrospective chart review will assess and compare the incidence of DPP in low dose heparin group (< 100 units/kg) and high dose heparin group (> 100 units/kg). Secondary outcomes evaluated will include a comparison of adverse events in the low dose verses high dose heparin group. Patients who have undergone a CC procedure from January 2010 to December 2012 will be screened for eligibility. The most recent 115 patients receiving high dose heparin and the most recent 115 patients receiving low dose heparin from December 2012 and before will be enrolled in the study. RESULTS AND CONCLUSION: Results will be presented upon conclusion of the study.

ACPE #:0126-9999-13-620-L01-P
Learning Objectives:
- List identified risk factors for thromboembolism after pediatric cardiac catheterization.
- Explain the risks and benefits of using heparin for prophylaxis during cardiac catheterization.


611 - ROLE OF AN AMBULATORY CARE PHARMACIST IN ATTAINING TARGET SERUM URIC ACID GOALS
B1. Ambulatory Care

Presented by:
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Presenting on Wednesday, May 15 at 5:00 PM in Royal V

Introduction: According to the American College of Rheumatology guidelines, chronic gout affects an estimated 3.9% of adults (8.3 million people) in the United States alone and is one of the most common rheumatic diseases in adults. Uric acid-lowering agents are indicated in patients with high serum uric acid (>6.8 mg/dl) and symptomatic gout, which often manifests as frequent acute gout flares and/or complications such as tophi. While serum uric acid levels alone do not necessarily correlate with the frequency of acute gout attacks, studies have shown that maintaining the serum uric acid level below 6 mg/dl prevents gout flares in most patients as this reflects a concentration in the tissue that is below the saturation point of uric acid.

Methodology: Patients with uncontrolled gout or gout complicated by tophi who were evaluated and referred by their primary care provider, and in whom urate lowering therapy was indicated, were enrolled in the pilot ambulatory care pharmacist-run gout clinic at Kaiser Permanente Roseville. A retrospective chart review was performed on all patients enrolled in the ambulatory care pharmacist- run gout clinic from March 2012-December 2012 with a pharmacist intervention. The study objective was to determine the impact of an ambulatory care pharmacist-run gout clinic on target serum uric acid levels and patient outcomes. There were three primary outcomes: 1) A comparison between the average time above goal serum uric acid level of <6 mg/dl pre- and post- clinic enrollment, 2) a comparison between serum uric acid level change over time pre- and post- clinic enrollment, and 3) the percent of patients enrolled in the clinic achieving a goal serum uric acid level of <6 mg/dl. The comparison between the average time above goal serum uric acid level of <6 mg/dl pre- and
post-clinic enrollment and the comparison between average change in serum uric acid level over time in patients pre- and post- clinic enrollment were analyzed using a paired t-test.

Results and Conclusion: The goal of this clinic was to effectively manage the patient’s gout through improved medication use and to ultimately reach target serum uric acid concentrations of less than 6mg/dl. Evaluating the efficacy of this clinic will allow Kaiser Permanente Roseville to determine the benefit of the clinic to patients with gout. The results and conclusion of this investigation will be presented.

ACPE #:0126-9999-13-621-L01-P

Learning Objectives:
- Describe the impact of an ambulatory care pharmacist-run gout clinic on serum uric acid levels.
- Explain the differences between pre-clinic enrollment and post-clinic enrollment in attaining serum uric acid levels.


612 - DEVELOPING AND INCORPORATING PHARMACIST-LED DISCHARGE MEDICATION RECONCILIATION AND DISCHARGE COUNSELING

B4. General Clinical Practice

Presented by:

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Presenting on Wednesday, May 15 at 2:00 PM in Royal IV

In May 2011, a new pre-admission medication reconciliation program was implemented at Banner Estrella Medical Center with the goal of improving the continuity of patient home medications. The success of this program has shed light on the pharmacy department’s role in the patient discharge process at Banner Estrella, which currently does not include an active role of a pharmacy staff member.

Hospital discharge is a time when patients are extremely vulnerable to medication errors as new medications are prescribed and home medications may be changed. Thorough and accurate medication reconciliation and counseling completed by pharmacists prior to discharge provides additional opportunity to ensure safe and appropriate transition of care in addition to prevention of medication related errors.

The objective of this study is to implement a pilot program that highlights a pharmacist-specific role in the current discharge process as well as determine the program’s feasibility and efficacy. Measureable outcomes for this objective include interventions identified (type and severity) and time required for each patient review. Secondary objective of this study is to review potential benefits of discharge counseling on readmission and emergency department visits due to medication related events after discharge. Inclusion criteria in this study focused on high-risk patients identified by pre-determined criteria. Exclusion criteria included patients hospitalized within the last 30 days, hospital stay duration of less than two days, hospital stay categorized as “observation” status, and transfer to another care facility. The number of interventions, discharge consultations provided at bedside, and 14-day and 30-day post-discharge visit(s) to a Banner Health facility were collected from August 2012 to September 2012 (medication reconciliation only) and from November 2012 to December 2012 (discharge medication reconciliation and counseling). Results and conclusion of the study will be presented.
ACPE #:0126-9999-13-622-L01-P
Learning Objectives:
- Describe and identify preventable medication related problems that may arise during the discharge process.
- Explain the benefits of incorporating pharmacist-led discharge medication reconciliation and discharge counseling into a nursing driven discharge process.


613 - EVALUATION OF THE TRANSITIONAL CARE PHARMACIST (TCP) PROGRAM ON REDUCTION OF HOSPITAL 30-DAY READMISSION RATES IN HIGH-RISK PATIENTS

B4. General Clinical Practice

Presented by:

**Jenny Yu, PharmD**
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Presenting on Wednesday, May 15 at 2:30 PM in Royal IV

Introduction:
Previously published studies have assessed how transitional care pharmacists (TCP) contribute towards appropriate evaluation of ordered medications for patients discharged from the hospital. However, it remains unclear whether TCP involvement in the discharge process affects readmission rates and medication error prevention after hospital discharge. The objective of this study is to elucidate the impact of the TCP Program on the reduction of hospital 30-day readmission rates and prevention of potential adverse drug events (ADEs) in high risk patients.

Methodology:
A single center, retrospective chart review will be conducted among high risk hospitalized patients, defined as those admitted to the intensive care unit (ICU), transitional care unit (TCU), or medical surgery floors at Kaiser Permanente Oakland Medical Center. Data will be collected via proprietary electronic medical record and charting systems to identify discharged patients who received TCP services. All protected health information will be de-identified and kept confidential. An analysis will be performed using patient age, sex, race, location, documented pharmacist interventions, and number of hospital 30-day readmissions. A comparison will be conducted to evaluate monthly readmission rates between high risk TCP versus all high risk patients. TCP pharmacist documentation records will be analyzed to quantify TCP-prevented potential adverse drug events (ADE). Based on estimated ADE costs described in current literature, cost savings of TCP pharmacist interventions will be estimated. Statistical analysis, including a chi-square test, will be performed on all comparisons and quantitative data. The results and conclusions of this retrospective study will be further discussed.

ACPE #:0126-9999-13-623-L01-P
Learning Objectives:
- Describe the effect of the Transitional Care Pharmacist (TCP) program on the reduction of hospital 30-day readmission rates in high risk patients.
- Describe the potential cost savings from the Transitional Care Pharmacist (TCP) program interventions.
614 - EVALUATION OF PROCALCITONIN-GUIDED ANTIBIOTIC THERAPY IN SEPTIC AND SEPTIC SHOCK PATIENTS
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 4:30 PM in Palm II

Introduction: Procalcitonin (PCT) is the prohormone precursor of calcitonin that has been used as a diagnostic marker to indicate early stages of infection. Additionally, it has been able to show when the infection is controlled by the immune system with support from antibiotics. Current research indicates procalcitonin levels can be utilized to reduce unnecessary antibiotic use in order to decrease overall health care costs and to decrease risk for antibiotic resistance. The objective of this study is to determine the effects of procalcitonin-directed antibiotic therapy on the duration of antibiotics in patients admitted for sepsis and septic shock.

Methodology: Patients were identified by using ICD-9 codes from electronic and paper medical records and were included if the patient was >18 years old, if he or she received a diagnosis of sepsis or septic shock, and if antibiotics were indicated for treatment. Education was provided to the Emergency Department physicians and Intensive Care Unit physicians regarding procalcitonin guided therapy. Outcomes including duration of antibiotic therapy and length of hospital stay will be compared between patients before and after the physician education. Results and conclusions will be presented.

ACPE #:0126-9999-13-624-L01-P
Learning Objectives:
- Describe the role of procalcitonin as a biomarker of infection.
- Explain how procalcitonin levels can be utilized to guide antibiotic therapy in septic patients.


615 - VALIDATION OF A CURRENT SEPSIS ANTIBIOTIC TREATMENT ALGORITHM: IDENTIFYING AREAS FOR FURTHER REFINEMENT
A1. Infectious Disease - Anti-infective Agents

Presented by:
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Presenting on Wednesday, May 15 at 5:00 PM in Palm II
Introduction
The Surviving Sepsis Campaign initiative has identified the initiation of prompt, active antibiotic therapy in severe sepsis and septic shock patients as an important goal of therapy. Multiple studies have demonstrated that failure to do so has severe adverse consequences on clinical outcomes. Many institutions have implemented order sets or antibiotic treatment algorithms as a strategy to promote expedient delivery of antibiotics and limit the likelihood of using an inactive empiric agent. However, the process of developing these treatment recommendations for empiric therapy is not well elucidated.

The current University of California, Davis Medical Center (UCDMC) sepsis antibiotic algorithm was constructed based on the susceptibility testing of hospital-wide blood culture isolates over one year. Additional consideration in building the algorithm was given to the suspected source of sepsis, whether it was community-acquired or hospital-acquired, if the patient was immunocompromised, or if the patient had a severe beta-lactam allergy. The primary objective of this study is to validate and refine the antibiotic treatment algorithm for severe sepsis patients and assess whether an active agent is being administered within one hour of recognition of sepsis. A secondary objective is to contribute guidance on best practices in designing and maintaining an antibiotic treatment algorithm.

Methodology
This is a retrospective, single center study evaluating approximately 1,000 patients over a one year period from September 1, 2011 to August 31, 2012. Patients with severe sepsis or septic shock identified through the UCDMC Sepsis Initiative Collaborative registry who have positive microbiologic cultures were included. Subjects less than 18 years of age, patients admitted within 48 hours of trauma or burn injuries, and women in active labor were excluded. Study endpoints include adequate empiric therapy per septic episode defined as percent of patients who receive therapy active against causative pathogens within one hour. Confidence intervals for the proportion of subjects receiving adequate empiric therapy (overall and by source of infection) will be estimated using Wilson score intervals. Thirty-day mortality will be compared between patients who received appropriate antibiotics through the sepsis treatment order set and patients who met sepsis criteria but did not follow the order set, adjusting for other patient characteristics, using multiple logistic regression. Patient populations which had a higher percentage of receiving inadequate empiric therapy will be targeted for treatment algorithm refinement.

Results and conclusions are pending.

Learning Objectives:
- Explain barriers to timely administration of an active antibiotic in severe sepsis patients.
- Describe strategies and best practices to continually refine antibiotic recommendations and treatment algorithms for management of severe sepsis.

ACPE #:0126-9999-13-625-L01-P

616 - DEVELOPMENT AND IMPLEMENTATION OF A PHARMACY DASHBOARD FOR CONTINUOUS QUALITY IMPROVEMENT
C1. Pharmacoeconomics, Admin or Financial Mgmt

Presented by:
Yvonne Zorn, PharmD
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Introduction: Dashboards are valuable tools that aggregate various metrics and visually present data in an informative manner. They present meaningful data to allow the user to identify key trends, make comparisons, monitor performance, and much more. While these are important decision-making tools, the use of data visualization and dashboards is relatively uncommon in the field of pharmacy. The purpose of this project was to develop and implement a dashboard for the Stanford Hospital and Clinics Pharmacy Department. The pharmacy department is comprised of a decentralized structure with eleven inpatient pharmacy satellites and additional outpatient services at multiple sites. A comprehensive key metric dashboard allows for the integration of information from the entire department to a central location. This acts to increase cohesiveness, improve communication, and ensure continuous quality improvement within the pharmacy department. After implementation, the dashboard may be used to assess key metrics and to identify areas of improvement for the department.

Methods: As a tool for the entire department, both Stanford Hospital and Clinics Pharmacy Department managers and pharmacy staff helped to identify key metrics to be included in the dashboard. Metrics were organized into five main areas of focus for the department: clinical effectiveness, safety, quality/regulatory, distribution, and finance. Specific metrics include documented clinical interventions, internal error reporting, hospital-wide medication adverse event reports, internal regulatory inspection compliance, and more. Data is collected on a weekly or monthly basis for each of the corresponding metrics. The dashboard is then continually updated with this data.

Results and Conclusion: Following implementation, the dashboard was used to identify multiple areas of improvement for the department. These areas include more appropriate documentation of clinical interventions, increasing internal error reporting to identify potential system failures leading to “near miss” medication errors, and improvement in compliance with various internal regulatory inspections. Prior to the implementation of the dashboard, much of the data for the key metrics was already collected on a regular basis, but not utilized for continuous quality improvement. The implemented dashboard may now allow for continuous, centralized tracking and trending of key pharmacy metrics.

ACPE #:0126-9999-13-626-L01-P
Learning Objectives:
  Describe the utility of dashboards within the field of pharmacy.
  List specific ways in which a dashboard can help develop continuous quality improvement in pharmacy.


617 - GRADUAL DOSE REDUCTION OR DISCONTINUATION OF ANTIPSYCHOTICS IN PATIENTS AFTER THREE MONTHS USING NEW CDPH AND CMS GUIDELINES

B1. Ambulatory Care

Presented by:

Sonal Mahajan, PharmD
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Presenting on Tuesday, May 14 at 5:00 PM in Sunset V

Objective:
Our study objective is to detect gradual dose reductions/discotinuations of antipsychotics in this SNF after implementing the use of the CDPH Antipsychotic Checklist to guide selection and justification of antipsychotics in order to meet the governmental recommendation of a 15% dose-reduction rate.

Methods/Study Design:
This study is a retrospective chart review of various primary and secondary outcomes such as changes in functional, behavioral, and cognitive outcomes, indications for antipsychotic usage, and treatment emergent adverse events among others.

Descriptive weighted analysis was used to examine the antipsychotic prevalence patterns at this facility. After Social Services implements the CDPH Checklist for Antipsychotics, we plan to focus on the patients who specifically have the diagnosis of dementia and look for dose reductions or possible discontinuation attempts in these residents.

Results/Analysis:
Baseline quality assurance data collection for the total 236 patients at skilled nursing facility found: 18.6% (45 patients) on antipsychotics and of them 16% are males and 84% are females. The average age was 88.8 years. More than half (57%) were diagnosed with Dementia. Other indications for the antipsychotic use included: 5% with Bipolar disorder, 11% with Depression, and 59% with Psychosis. All patients were found to be on monotherapy (one antipsychotic).

Additionally, adverse effects mainly reported: 36% lethargy; weight changes in 20% showed an average weight loss of 3.9 pounds and 75% gained an average of 9.4 pounds; anticholinergic effects (34% dry mouth,34% constipation, 9% vision changes, 9% dry eyes and 7% urinary retention); extrapyramidal effects (14% Tardive Dyskinesia; 5% Parkinsonism and 2% reported akathesia)

The repeat data collection after implementing the CDPH Antipsychotic Checklist is currently in process.

Conclusions/Interpretations:
Until follow-up data collection can be collected, no conclusions have been made.

ACPE #:0126-9999-13-628-L01-P
Learning Objectives:
- Describe the magnitude of the risks and benefits of antipsychotics for individuals with dementia residing in nursing homes.
- Explain the CMS quality measures on the use of antipsychotic medication in your practice