Introduction to the Medication Regimen Review—Part 3

Part 1 of this series provided an introduction and overview of the medication regimen review (MRR) process [Consult Pharm 2010;25:710-20]. In Part 2, a framework for MRR was presented [Consult Pharm 2010;25:778-802]. This article reviews and expands on the elements of the MRR framework and provides examples of implementation.

**Abbreviations:** ADR = Adverse drug reaction, MRP = Medication-related problem, MRR = Medication regimen review, PPI = Proton-pump inhibitor, SOM = State Operations Manual.

**Medication Use Without Indication**

One of the most common recommendations of the consultant pharmacist is to discontinue unneeded medications. In geriatrics, it is common to see patients receiving medications that lack a valid indication, sufficient evidence for use, or adequate documentation of the resident's need for the medication. Medications may be continued past the time when they are needed or may have been started without adequate justification. Prescribers are sometimes reluctant to discontinue medications that were started by another physician, even if they do not see a current need for the medicine.

One common example of medications that are often unneeded is proton-pump inhibitors (PPIs). These medicines are often started in the hospital and then continued upon discharge even though the patient lacks a valid indication for use. PPIs increase the risk of *Clostridium difficile* infection, fractures, and pneumonia.4 The elevated stomach pH induced by PPIs also interferes with absorption of vitamin B₁₂, calcium carbonate, and ferrous sulfate. To complicate this issue, abrupt discontinuation of PPIs can cause rebound hyperacidity, which

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This article is the last in a three-part series about the medication regimen review process. Described as “drug regimen review” in federal regulations, the Centers for Medicare & Medicaid Services now uses the term “medication regimen review” in the State Operations Manual. This series of articles is adapted from three articles published in 2003 in *The Consultant Pharmacist*, authored by Thomas R. Clark, Joseph Gruber, and Mark Sey.1-3

When conducting medication regimen reviews (MRRs), consultant pharmacists not only identify actual or potential drug therapy problems, but also make recommendations to resolve or prevent those problems. A closer look at each type of medication-related problem (MRP), as well as examples of the pharmacist’s action and the therapeutic outcome, are detailed below.
may reinforce the perception that the drug is needed. Therefore, some prescribers are reluctant to discontinue these agents. Consultant pharmacists can engage in this process by recommending that PPIs be successfully discontinued by gradual tapering, along with use of an “as needed” H₂ inhibitor, such as ranitidine.

An important role of the consultant pharmacist is to evaluate the need for medications. The greater the number of medications used, the greater the likelihood of adverse drug reactions and drug interactions, and the higher the cost of the medication therapy. Unneeded medications can also result in extra physician or emergency room visits or hospitalization. It is important to ensure that residents receive only the medications that are needed for treatment.

**Adverse effects of medications often are not recognized in the elderly. Instead, these symptoms may be attributed to underlying medical conditions or old age.**
One variation on this theme is when a patient receives duplicate drug therapy, such as two antipsychotics. Even if an indication is present for use of an antipsychotic, use of the second agent may be inappropriate.

The patient is an 86-year-old nursing facility resident who has a rash on her legs and buttocks. The attending physician diagnosed the rash as a fungal infection and wrote an order for an antifungal cream to be applied every shift to the affected areas.

The consultant pharmacist reviews the chart. The nursing progress notes indicate that the rash has been resolved for more than one week. The antifungal cream is still being applied as ordered three weeks ago. The consultant pharmacist contacts the physician with a request to review the continued need for the antifungal cream considering the absence of a rash. The physician evaluates the resident and discontinues the cream.

Untreated Indications
A number of conditions have been found to be untreated or undertreated in nursing facility residents, including depression and pain. Pharmacists can help identify residents for whom treatment may be indicated and suggest treatment options to the prescriber. Knowledge of evidence-based practice and clinical guidelines is important so that the consultant pharmacist can make informed, appropriate suggestions consistent with best practices.

Two important caveats must be mentioned. First, pharmacists are generally not trained in diagnosis, nor is it within the scope of pharmacy practice. Before specific treatment is initiated, a diagnostic evaluation by the physician or other trained health care professional is needed to confirm the diagnosis.

Second, in geriatrics, the presence of an indication does not automatically mean that treatment is desirable or appropriate. In the frail elderly, the potential for adverse effects from the treatment may be greater than the benefit received. For residents near the end-of-life, even mild side effects may outweigh the benefit of a treatment that is designed to prevent long-term complications or problems. Treatments that improve one condition may worsen a coexisting condition. Sometimes the most appropriate course of action is not to treat a particular diagnosis or condition.

When dealing with untreated indications, the pharmacist should be particularly prudent about treatment recommendations. When a decision is made not to treat a particular indication, it is important that documentation of this decision be included in the medical record.

Related to the issue of untreated indications is consideration of the intensity of treatment. In the frail elderly, customary treatment targets from clinical practice guidelines, such as blood pressure (BP) of 130/80 in diabetics or a hemoglobin A1C less than 7%, may be overly aggressive. BP that is too low can increase the risk of falls and fractures, and aggressive management of blood glucose in elderly patients with long-standing type 2 diabetes mellitus increases the risk of hypoglycemia and mortality without improving cardiovascular outcomes.

Glycemic control efforts should individualize hemoglobin A1C targets so that those targets and the actions necessary to achieve them reflect patients’ personal and clinical context and their informed values and preferences.

The patient is a 78-year-old male resident complaining of urinary urgency. The nursing assistants were reporting that the resident requested to “go to the bathroom all the time and nothing would happen.” Nursing attributed this behavior to possible dementia and was considering calling for a psychiatry consult.

When the pharmacist reviewed the resident’s chart, a history of benign prostatic hypertrophy was noted. The pharmacist recommended the resident be started on tamsulosin 0.4 mg once daily. The physician was contacted and tamsulosin 0.4 mg daily was started. At the next monthly visit by the pharmacist, an inquiry was made about the status of the resident. Nursing staff reported the resident improved dramatically and was able to be discharged home.
Improper Medication Selection

Selection of a medication for an older adult must be done carefully. In addition to the diagnosis, a number of other factors need consideration, such as the overall health of the resident, allergies, renal and hepatic function, comorbidities, concomitant medications, age, and body weight.

Medications may be inappropriate for the elderly either because they are unlikely to be effective for a specified condition or problem, or because the potential for harm is greater than the potential for benefit. An example would be using an antibiotic to which an organism has demonstrated resistance.

The patient is an 81-year-old nursing facility resident receiving amitriptyline for depression. She is taking two different laxatives for chronic constipation. The consultant pharmacist recognizes that this resident’s use of amitriptyline may be contributing to her constipation. Furthermore, because amitriptyline’s anticholinergic effects can cause other problems in the elderly, such as dizziness (increasing the risk of falls) and cognitive decline, the State Operations Manual (SOM) lists amitriptyline as a medication that is generally considered inappropriate for use in the elderly. After discussing this with the physician, the medication is changed to a different class of antidepressant.

Consider another example of the use of amitriptyline in an older adult:

The patient is a 73-year-old nursing facility resident admitted with diagnoses of depression and diabetic neuropathy and is receiving amitriptyline for these conditions. Facility assessments indicate the resident is no longer depressed, and the painful, burning sensations of her lower extremities have been greatly reduced. No significant adverse effects from the amitriptyline are noted. The consultant pharmacist recognizes the potential for amitriptyline to be inappropriate in the elderly. Although there are newer treatments available for the treatment of neuropathies, the pharmacist recommends continued use of this medication because of the patient’s positive response to the treatment and lack of adverse effects. The pharmacist recommends monitoring the resident for the emergence of specific anticholinergic effects and documents the rationale, including a risk/benefit analysis in the patient’s health record.

Effective communication with prescribers is an integral part of the medication regimen review process.
Subtherapeutic Dosage
When prescribing to the elderly, many follow the adage, “start low and go slow.” The problem is that some prescribers “start low” but never “go.” The result is a dose of medication that has little or no effect. Some medication classes are particularly susceptible to underdosing, including some psychoactive medications, narcotics, and other pain medications. An important role of the consultant pharmacist is to identify this underdosing and intervene when the desired therapeutic response is not achieved.

The patient is an 83-year-old resident with osteoarthritis. She has an order for acetaminophen 500 mg four times daily, but frequently has moderate-to-severe pain a few hours before her next dose is due. The pharmacist contacts the prescriber and recommends a trial of acetaminophen 650 mg four times daily and “as needed,” not to exceed 4 g of acetaminophen per day. The pharmacist informs the nursing staff to monitor for pain throughout the 24-hour day to assess the efficacy of the increased dose.

Overdosage
Excessive dosing occurs when the patient has a medical problem that is being treated with too much of the correct medication. Because of low body mass, impaired or diminished renal or hepatic function, and increased sensitivity to many medications, doses may need to be

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* Note that it may be appropriate to leave some indications untreated in older adults, because of consideration of risk versus benefit of treatment for the condition.
adjusted downward to reduce the incidence of toxicity in the frail elderly. Because prescribers still overlook the need for reduced medication doses in the elderly, consultant pharmacists often identify these potential excessive doses and intervene to help prevent toxicity or adverse effects.

The patient is a 79-year-old male resident who is receiving digoxin 0.25 mg daily for heart failure. During MRR, the pharmacist notes that the patient has recently experienced weight loss associated with loss of appetite and periodic episodes of nausea, both of which may be associated with digoxin toxicity. After careful review to rule out other medications and factors that may cause weight loss, the pharmacist contacts the physician to recommend a digoxin serum concentration. The test was done and the value was elevated. Upon reduction of the digoxin dose to 0.125 mg daily, the resident’s symptoms subsequently resolved.

Adverse Drug Reactions
An adverse drug reaction (ADR) is one form of an adverse consequence, as defined by Appendix PP in the SOM. More specifically, an ADR is any unexpected, unintended, undesired, or excessive response to a medicine that:

- Requires discontinuing the medicine
- Requires changing the medication therapy
- Requires modifying the dose (except for minor dosage adjustments)
- Necessitates admission to a hospital
- Prolongs stay in a health care facility
- Necessitates supportive treatment
- Significantly complicates diagnosis
- Negatively affects prognosis
- Results in temporary or permanent harm, disability, or death

The frail elderly are at high risk for adverse effects from medications. In addition to the typical adverse effects (e.g., nausea, constipation), medications can cause or contribute to a variety of common geriatric problems, such as falls, urinary incontinence, and dementia or mental confusion that can lead to significant functional decline and increased morbidity and mortality in the elderly.

Adverse effects of medications often are not recognized in the elderly. Instead, these symptoms may be attributed to underlying medical conditions or old age. An important role of the consultant pharmacist is to assist the nursing facility staff in recognizing medication adverse effects and in intervening to prevent or reduce them.

The prescribing cascade results when medication adverse effects are misattributed to a new disease or condition. The prescribing cascade was discussed in Part 2 of this series of articles. Examples include starting a patient on medication for Parkinson’s disease when a patient displays extrapyramidal symptoms from a medication such as metoclopramide, or starting a patient on an anticholinergic medicine for overactive bladder when the symptom is being caused by an acetylcholinesterase inhibitor.

The patient is an 88-year-old female resident who has fallen twice in the past two weeks—fortunately, without serious injury. In reviewing the medications, the consultant pharmacist finds that this resident is taking several medications that can increase the risk of falls. The pharmacist suggests changes to the medication regimen to decrease the fall risk.

If the adverse effect is serious, the pharmacist should report the incident to the Food and Drug Administration’s (FDA) MedWatch program at www.fda.gov/medwatch. These reports help support FDA’s postmarketing surveillance activities.

Drug Interactions
A drug interaction with food, a dietary supplement, another medication, or a laboratory test is another adverse consequence. As the number of prescribed medications increases, the risk of an interaction with a medication multiplies. The consultant pharmacist can help prevent drug interactions by educating facility staff...
about common drug interactions, as well as identifying drug interactions during the MRR process.

Warfarin drug interactions have been reviewed in a recent article in *The Consultant Pharmacist*. A list of top 10 dangerous drug interactions in long-term care was developed jointly by the American Society of Consultant Pharmacists and the American Medical Directors Association in 2001, and is still available at: [http://www.scoup.net/M3Project/topten/index.htm](http://www.scoup.net/M3Project/topten/index.htm).

*The patient is a 90-year-old resident with atrial fibrillation. The only routine medications she receives are warfarin and a multivitamin. The physician prescribes levofloxacin for suspected bronchitis. Because it is late in the evening, the nurse obtains the initial dose from the emergency box and sends the physician’s order to the pharmacy. Upon receiving the order, the dispensing pharmacist calls the facility to alert the nurse of an interaction between warfarin and levofloxacin. The physician is contacted, and close monitoring of the prothrombin time/international normalized ratio is ordered for the duration of the levofloxacin regimen. On the next visit, the consultant pharmacist works with the director of nursing to develop strategies to prevent this situation from occurring in other residents.*

**Medication Monitoring**

Medication monitoring includes the assessments necessary to determine achievement of the medication’s therapeutic objectives and to minimize the likelihood of adverse effects. This can include laboratory assessments, physical assessments (e.g., vital signs), depression scales, mental-status exams, abnormal movement scales, or other evaluations. Consultant pharmacists frequently recommend laboratory or other monitoring to help ensure safety of medications or to determine whether the therapeutic objective is being achieved with the medication therapy. A study by Steven Handler and colleagues reviewed laboratory monitoring of nursing facility residents. Consultant pharmacists should also review results of medication monitoring and intervene if these results indicate a need for action that has not already taken place. Depending on an individual state’s professional practice regulations, pharmacists (in collaboration with the physician) may request laboratory tests or specialized services such as anticoagulation clinics or pharmacokinetic dosing of aminoglycosides or other medications.

*The patient is a 78-year-old female resident who routinely has received*
ibuprofen for the past six months. The consultant pharmacist cannot find any evidence that a complete blood count or any renal function tests has been obtained since the medication was initiated. The consultant pharmacist requests that this test be conducted.

Medication Errors

The National Coordinating Council on Medication Error Reporting and Prevention has defined medication error as: any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including: prescribing; order communication; product labeling, packaging, and nomenclature; compounding, dispensing, distribution, administration, and education; monitoring; and use.13

In the nursing facility environment, consultant pharmacists are alert to signs of medication errors during the performance of MRR. Working with the staff of the facility to identify problems and improve the medication use system is an important part of the pharmacist’s responsibility.

During an MRR, the consultant pharmacist noted that the patient was receiving lispro insulin 10 units subcutaneously daily. Lispro insulin is rapidly acting and is usually given 15 minutes before a meal. Upon checking with the prescriber, the pharmacist found that the physician intended to order Lantus insulin. Lantus insulin is long-acting and usually given once daily.

P. G. is an 85-year-old female who was recently admitted to the nursing facility. While reviewing a medication administration record on a resident, the pharmacist observes a note written next to one of the admitting medication orders: “Oxycodone not given because not received from the pharmacy.” The new medication was not started until three days after it was ordered. The pharmacist contacts the director of nursing to help develop strategies to prevent this problem from occurring in the future.

Conclusion

A final point to consider is that, no matter how well the MRR is conducted, the findings and recommendations must be effectively communicated to the attending physician and director of nursing. It is also desirable to include the medical director in these communications. Effective communication with prescribers, therefore, is an integral part of the MRR process. An excellent review of this subject was published in The Consultant Pharmacist in 2010.14

Prescribers are sometimes reluctant to discontinue medications that were started by another physician, even if they do not see a current need for the medicine.
Conducting the MRR is one of the fundamental responsibilities of the consultant pharmacist in the nursing facility. It is a key function in a number of other long-term care settings and can serve as a general structure for pharmacist-patient encounters in the ambulatory setting as well. MRR also plays an important role in quality assurance for the facility medication use system, and is a valuable tool in identifying and resolving system problems.

Properly conducted, communicated, and assessed for response, MRR improves quality of care and quality of life for residents—and can sometimes save lives. This series of three articles has been developed to provide an overview and framework for performing this signature consultant pharmacist service.

References