Engaging Physicians in Diagnostic Process Improvement: Innovative Interventions
A Two-Site Reflection

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Index Admission

67yo man w CC: N/V

PMH
- Stage IV lung cancer on atezolizumab
- PE on enoxaparin

Dx
- Hypovolemic hyponatremia and pre-renal AKI
- Cerebellar met
Readmitted 4d later

CC: Hematemesis

Mngt
- Enoxaparin held
- CT with invasion of tumor into esophagus
- EGD planned

Course
- Aspiration event
- Hypoxemic resp failure
- Death
Timeline:
Hospital Course and Readmission

**HOD #1**
- Hgb: 10 (baseline 11)
- Lab: Considers bleeding
  - No melena/hematochezia
  - No sx of retroperitoneal bleed
  - Dilution? Plan to trend

**HOD #2**
- Hgb: 9
- Mgmt: MRI brain: New cerebellar met
  - 2L IVF

**HOD #3**
- Hgb: 8
- "Stable Hgb"
- Dc w f/u 3 wks
Beyond Board-Certified MD: Diagnosis is Complex

<table>
<thead>
<tr>
<th>Medical Content Category</th>
<th>% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastroenterology</td>
<td>9%</td>
</tr>
<tr>
<td>Geriatric Syndromes</td>
<td>3%</td>
</tr>
<tr>
<td>Hematology</td>
<td>6%</td>
</tr>
</tbody>
</table>

![Diagram showing the distribution of medical content categories with Gastroenterology and Hematology]
In the Room: Exploration of Perspectives

• How many of you have engaged in improvement work to improve diagnostic accuracy?
  • What was it?
  • What barriers have you encountered?
Change is HARD

Changing the Diagnostic Process is IMPOSSIBLE
Objectives and Roadmap

• Explore Two Case Studies in Diagnostic Process Improvement
  • Understand role of diagnostic pause and provider-level feedback

• Unpack Barriers Encountered and Attempts to Mitigate Them
  • Define two measurement techniques
  • Name one strategy for engaging institutional leadership
  • Describe one guiding principle of provider engagement
Society to Improve Diagnosis in Medicine (SIDM)

• Focusing solely on the problem of diagnostic error and improving the accuracy and timeliness of diagnosis

• Seeking solutions that enhance diagnostic safety and quality, reduce harm, and ultimately, ensure better health outcomes for patients.
Diagnostic Error

• National Academy of Medicine (formerly IOM), 2015
  • Occur in 5% of outpatient visits—12 million adults
  • Contribute to 10% of deaths
  • Contribute up to 17% of adverse hospital events
  • Are the leading cause of paid malpractice claims

• Estimated costs ranging from $17 billion and $29 billion annually
Aim: Improve Diagnosis to Reduce Harm

Primary Drivers:
- Care Team
  - Team Structure
  - Team Leadership
  - Team Communication and Behavior
  - Patient, Families and Caregivers as Team Member

Secondary Drivers:
- Diagnostic Environment & the Diagnostic Process
  - Organizational Structure
  - Clinical Operations
  - Access to Care

- Patient, Family and Caregiver
  - Patient, Families and Caregivers as Team Member
  - Patient Engagement and Empowerment

- Diagnostic Cognitive Performance
  - Clinical Decision Support
  - Reflective Self-Practice
  - Diagnostic Environment

- Learning System & Environment
  - Culture of Psychological Safety and Transparency
  - Quality Improvement Structure and Process
  - Education and Training Structure and Process
The project advances a plan to break the cycle of inaction by enabling pioneering healthcare organizations to begin experimenting with interventions and evaluating their relative merits and impact.

- **University of California San Francisco**
  - Utilizing Triggered Two-Person Review to Identify, Characterize and Feedback Diagnostic Error

- **Nationwide Children’s Hospital**
  - Improving Differential Diagnosis in Patients Admitted with Abdominal Pain
Quality Improvement vs. Research

PDSA Steps

1. Identify mission and establish project team
2. Understand evidence and other institutional models
3. Review evidence and other institutional models
4. Develop aim statement
5. Collect baseline data
6. Develop and implement interventions
7. Collect and analyze post-intervention data
8. Hardware or modify interventions as necessary

The Scientific Method
“A method or procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses” (Oxford Dictionary)
Barrier 1: Creating a sense of urgency - Need Measures!
Intervention: Diagnostic Error Index

- Five sources of Diagnostic Errors (DE):
  - Non-forensic autopsy reports with class I findings
  - RCA of adverse events with individual and system-related failures
  - Medical record triggers (e.g. missed appendicitis)
  - Morbidity and mortality cases
  - Other adverse event reports

- Each case adjudicated by DERQI Team

- DE summed monthly
Learning: Diagnostic Error Index

Baseline DEI = 7 cases/mo
Barrier 2: Institutional Buy-in
Intervention:
2p Triggered DE Review

2p Safer Dx Review + Adjudication
- if DE possible -

Provider Contact + DEER Taxonomy Tool
Measures: 2p Triggered DE Review

- 156 (100%) readmissions enter review
- 16 (10%) diagnostic errors detected
- 14 (88%) moderate morbidity, LOS, Cost
Learning: Diagnoses and Process Error

Liver abscess
Hepatic hematoma
GIB x2
Cholangitis

Peritonsillar abscess
Hypernatremia
SiADH
Lupus flare
w ITP
Liver abscess
Hepatic hematoma
GIB x2
Cholangitis

Lab Misinterpretation 69%
Diagnostic Measures: Implications, Challenges, Learning

• Implications
  • Situational awareness

• Challenges
  • Defining diagnostic error
  • Selecting medical triggers
  • Logistical challenges
  • Overcoming negative perception
  • ‘Choosing Wisely’ campaign

• Learning
  • It is a starting point
Problem: Cognitive Bias and Faulty Heuristics

- Associated with diagnostic inaccuracies in up to 77% of case vignettes/real scenarios


- Dual processes in thinking and decision-making
  - Intuitive process (System I)
  - Analytical process (System II)
Experiments of Change: Debiasing Strategies and Diagnostic Time-Out

Implementation of diagnostic pauses in the ambulatory setting

Grace C Huang,1,2 Gila Kriegel,1,2 Carolyn Wheaton,1 Scot Sternberg,1 Kenneth Sands,3 Jeremy Richards,1,2 Katherine Johnston,2,4 Mark Aronson1,2

Box: Diagnostic pause tool

You are receiving this form because one of your patients has returned for an urgent care visit for the second time in 2 weeks

1. What is the working diagnosis for this presentation?
2. What features of the case go against this diagnosis?
3. Could it be a can’t miss diagnosis such as ‘cancer or clot’?
☐ Doubt it ☐ Maybe ☐ Actually, yes
4. Having had the chance to reflect on this case and to see test results, do you think you will do anything different?
☐ I’m OK with my current plan of action for this patient.
☐ Now that I’ve thought about it some more, I will (check all that apply)
   ☐ Look up some information (web, UpToDate)
   ☐ Order another test
   ☐ Make a medication change
   ☐ Have the patient come back for follow-up
   ☐ Refer the patient to a specialist
   ☐ Contact the primary care physician to do one of the above
   ☐ Ask the triage nurse to call patient in 3–5 days
   ☐ Other
Intervention: Diagnostic Time-Out

• Two-item checklist:
  • What are the 2-3 likely reasons for this patient’s presentation
  • What are 1-2 can’t miss diagnoses we must rule out?
Measures: Percent of Documented DDx

% of Pts Admitted to Hospital Peds w Abdominal Pain w a Well-Documented Differential Diagnosis

- Diagnostic Time-Out

Chart Type: p-Chart
Measures: Diagnostic Error Index
Diagnostic Time-Out: Implications, Challenges, Learning

• Implications
  • Situational awareness

• Challenges
  • Consistency between physician teams
  • Family involvement
  • Logistics: time and resources

• Learning
  • Dialogue is changing
Problem: Provider-level Diagnostic Error Feedback
“The Good Driver”
Intervention: Provider-level Feedback from DE review

- Readmission Review

The use of Provider-identified readmission triggers

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DEER Taxonomy based discussion

Email Notification to Involved Provider with Request for In-Person Meeting
Feedback on Diagnostic Performance: Implications, Challenges Learning

• Implications
  • Providers desire feedback

• Challenges
  • Timeliness
  • Peer-peer feedback

• Learning
  • Support for clinical practice change
Barrier III: Eliciting and Sustaining Provider Engagement

• “I’m a pretty good doctor, I don’t think I need to change how I practice.”
  • Develop a system for diagnostic accuracy measure or process improvement measure

• “This is such a big problem, how do I even get started?”
  • Break large problem into small problem

• “This is important, but I have so many other things to get done.”
  • Align diagnostic accuracy with provider personal practice goals, ongoing academic work and certification requirements
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Changing the Diagnostic Process is POSSIBLE and IMPERATIVE
Appendix