Using deliberate practice to address cognitive error

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Workshop Objectives

• To understand the major types of cognitive errors

• To review some of the research evidence supporting deliberate and reflective practice

• To employ teaching and assessment strategies for approaching cognitive errors using reflection
Plan for this time

- Introductions
- Brief initial exercise
- Review of cognitive errors and a model of deliberate practice
- Exercises
- Group discussion
- Take home points
Exercise - 5 minutes

• Think about medical error, you might have made or are familiar with.

• What was the error? What caused the problem?
Medical Error
Categories Of Diagnostic Error

- **No-Fault Errors**
  - Unusual or silent presentation of disease (appendicitis with no abdominal pain)
  - Lack of patient cooperation

- **System Errors**
  - Inefficient processes (delay in lab results)
  - Policy failures (tests not available after hours)
  - Tolerance of known problems
Is This A System Error?

• 56 y/o male, CC: malaise, fever. T 103.9
• PE: Nontoxic appearing. Nonfocal for fever source.
• Nursing Note: (on separate page) "Hx of rectal pain X 2 days." (This hx not verbally offered to the physician by the patient or the nurse.)
• LABS and CXR: unremarkable except for WBC 16,000.
• ED progress: "After 2L IVF, patient feels well enough to go home.
• DX: Viral Syndrome
• Disposition: Home. Return to ED p.r.n.
• Outcome: Returned 24 H with sepsis secondary to perirectal abscess.
Categories Of Diagnostic Error

- Cognitive Errors
  - Inadequate knowledge
  - Faulty data gathering
  - Faulty information processing
  - Faulty metacognition
Cognitive Error Exercise

- In your groups think about the errors you discussed earlier.
  - What type of cognitive error may have been a factor in the error?
Strategies For Improvement

- Decrease reliance on memory
  - Clinical practice guidelines
  - Algorithms
  - Other evidence pathways that can be standardized...
- Minimize time pressured decisions
- Improving the way we think
Cognitive Improvement

- **Metacognition - thinking about how we think**
  - Awareness of the learning process - education should be directed at the specific cognitive requirements of clinical decision making
  - Recognition of limitations in memory - the increasing complexity of modern medicine has increased cognitive load
  - Ability to appreciate perspective - capacity to see the broader range of possibilities (step back from the immediate problem)
  - Capacity for self-critique - overconfidence in judgment is a significant error
  - Reminding oneself of specific lapses in the past without being paralyzed by those lapses
  - Ability to select strategies to deal with problems in decision making (cognitive forcing strategies and cognitive debiasing strategies)
Cognitive Forcing Strategies

- Minimizing or avoiding cognitive error is to develop a general working knowledge of how and why such errors occur.
- Clinicians may have little awareness of their own cognitive processes or of the various cognitive dispositions to respond that might affect their thinking.
  - Understand biases and heuristics.
- Cognitive forcing strategies are a specific debiasing technique that introduces self-monitoring around some decisions.
Cognitive Dispositions to Respond (Biases)

- **Broad Classifications:**
  - Errors of over attachment to a particular diagnosis
  - Error due to failure to consider alternative diagnosis
  - Error due to inheriting someone else’s thinking
  - Errors in prevalence perception or estimation
  - Errors involving patient characteristics or presenting context
  - Errors associated with physician affect or personality
Specific Forcing Strategy

1. Learn the metacognitive technique
2. Acquire knowledge of specific cognitive error
3. Identify scenario in which error is likely to occur
4. Apply specific cognitive forcing strategy
5. Avoid or minimize error
Exercise - Biases

In your groups think about the errors you discussed earlier and our additional discussion about the type of error it was:

• Now, take this a step further to see if your group is able to identify biases that may have been contributory.
Forcing Strategies - Fracture

- **Hx:** mechanism, motor/sensory change
- **PE:** deformity, bony tenderness, FROM, NVI
- **X-ray** all involved areas - high quality films
- Forcing strategy - when in doubt, treat as if fractured and refer to orthopedics or family physician
- Forcing strategy - Look for the second fracture
- Forcing strategy - reassess when pain is out of proportion to injury
Why Did This Happen?

• 11 y/o male presents to clinic, CC: scrotal pain & swelling, abdominal pain, vomiting.

• VS: BP 118/72, P 120, R 20, T 98.8

• PE: Alert, mild-mod distress. ABD: Soft, BS hypoactive, nontender. Rectal: NT, stool heme negative. GU: Right hemiscrotal swelling and tenderness
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• DX: Gastroenteritis

• Disposition: Home

• Outcome: Returned to Pediatric clinic 12 hours later.

• OR findings: Non-salvageable right testicle.
Discussion

How are you currently approaching cognitive error in your students, residents, attendings?
Specific Forcing Strategy

Learn the metacognitive technique

Acquire knowledge of specific cognitive error

Identify scenario in which error is likely to occur

Apply specific cognitive forcing strategy

Avoid or minimize error
Deliberate Practice

- Intentional focus on processes that might prevent errors
- Incorporate experiences and feedback to gain and learn from them.
- Intentional practice of certain steps may allow for purposeful and repeated actions which improve patient care.
- One such deliberative step is a period of focused reflection.
Specific Forcing Strategy

1. Learn the metacognitive technique
2. Awareness of unusual cases
3. Review known heuristics and biases
4. REFLECTION
5. Avoid or minimize error

Deliberate Action
Reflection
Definition of Reflection

• “...intellectual and affective activities in which individuals engage to explore their experiences in order to lead to a new understanding and appreciation.”
  

• “a basic mental process with either a purpose, an outcome, or both, applied in situations in which material is unstructured or uncertain and where there is no obvious solution.”

Models of Reflection

1. Doubt or uncertainty
2. Definition of the uncertainty
3. Suggested explanation (induction)
4. Rational elaboration (deduction)
5. Hypothesis testing

- Dewey 1933
Models of Reflection

Schön, 1987

Knowing in action
Usual activity
Surprise
Reflection in action
Experimentation
End of action
Reflection on action
Models of Reflection

- Originate in different fields of study
- Generally depict an iterative process
- Some delineate different levels of reflection
- Deeper levels more difficult to achieve
- Few are explicit about role of emotions
Potential Benefits of Reflection

- Learning
- Facilitation and integration of theory and practice
- Increased awareness and development of self regulation
- Improved practice
What we understand...

- Physicians and students engage in reflective practice
- It can be measured and classified
- It appears to be developed through practice and supervision
- Reflective practice appears linked to learning and development
- It is enabled or hindered by certain factors
Exercise

In your groups:

Think about a usual day in the area that you practice, how are you currently using deliberate practice and/or reflection?
Exercise

• In your groups return to the errors and biases you discussed earlier:
  • Using the strategies discussed thus far, consider how you might teach deliberate practice and reflection to address such errors?
Sharing Our Discussion
Strategies to Take Home
Questions?