Mindful Medicine

An Approach to Acknowledging and Avoiding Cognitive Bias
Contributor’s Page

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“The most fruitful lesson is the conquest of one's own error. Whoever refuses to admit error may be a great scholar but he is not a great learner. Whoever is ashamed of error will struggle against recognizing and admitting it, which means that he struggles against his greatest inward gain.”

Goethe, Maxims and Reflections
Objectives

• Demonstrate a working knowledge of the concepts of cognitive bias and mindful practice
• Demonstrate an ability to recognize cognitive bias in a trainee and oneself
• Devise a plan in which to mitigate cognitive bias in a trainee and oneself
• Discuss ways to incorporate these concepts into trainee evaluations
Workshop Outline

• Welcome and Introduction: 10 min
• Short didactic session (clinical reasoning styles/cognitive bias): 15 min
• Large group discussion (cognitive bias examples): 25 min
• Small group activity (case-based scenarios): 20 min
• Short didactic session (mindful practice/strategies to mitigate cognitive bias): 15 min
• Individual reflection exercise (cognitive bias example, contributing factors): 30 min
• Large group discussion (trainee evaluations coincide with EPAs): 10 min
Impact of Medical Errors

• Of the 93 safety projects funded by AHRQ, only 1 is focused on diagnostic error, and none of the 20 evidence-based AHRQ Patient Safety Indicators directly measures failure to diagnose.

• Cost of all errors-44,000 hospital deaths and $20 billion.
System Errors - Attempts to Build a Better System

- Team breakdown, hand offs
- Communication errors
- Equipment failure
- Performance of a test
- Falls, pressure ulcers, DVTs
- Misidentification of patient
- Technical failures
- Inadequate policies
What is a Diagnostic Error?

- Missed diagnosis
- Delayed diagnosis
- Rate of diagnostic error is 10-15%

Etiology of Diagnostic Errors

- **System errors**
  - Breakdowns in the healthcare system
  - Present in all fields of medicine

- **Cognitive biases** (Faulty clinical reasoning)
  - Distortion in the clinical reasoning process that led to a missed or delayed final step of diagnosis
  - Lack of knowledge re: disease process is rare

- **Both**

Diagnostic errors happen to everyone

- Defective reasoning
  - Anyone, even most experienced
  - Most Common cause
- Inadequate knowledge
  - Rookie errors
  - Senior clinicians with knowledge lapse
  - Less common cause
Other Reasons They Happen

• Many diagnoses are subtle
• Many are similar in presentation to many other conditions
• Sometimes, our heads aren't in the game
• Sometimes, people don’t know what to tell us
• Sometimes, people lie
Large Group Share Activity

• What are the 2 types of reasoning styles commonly used?

• Provide a few examples from each type
How we think through our patients

• Intuitive approach
  – Based on pattern recognition
  – Use of previous knowledge or experiences

• Analytical approach
  – More often used when one is confronted with complex or diagnostically challenging case
  – Process is slower and more deliberate
  – Uses significant cognitive effort to reason through decisions; can thus be inefficient

• Should use both

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Type 1</th>
<th>Type 2</th>
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</thead>
<tbody>
<tr>
<td>Reasoning style</td>
<td>Intuitive</td>
<td>Analytical</td>
</tr>
<tr>
<td></td>
<td>Heuristic</td>
<td>Normative</td>
</tr>
<tr>
<td></td>
<td>Associative</td>
<td>Deductive</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
<td>Abstract</td>
</tr>
<tr>
<td>Awareness</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Verbal behaviour</td>
<td>None to minimal</td>
<td>Yes</td>
</tr>
<tr>
<td>Prototypical</td>
<td>Yes</td>
<td>No, based on sets</td>
</tr>
<tr>
<td>Action</td>
<td>Reflexive, skilled</td>
<td>Deliberate, rule-based</td>
</tr>
<tr>
<td>Automaticity</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Speed</td>
<td>Fast</td>
<td>Slow</td>
</tr>
<tr>
<td>Channels</td>
<td>Multiple, parallel</td>
<td>Single, linear</td>
</tr>
<tr>
<td>Propensities</td>
<td>Causal</td>
<td>Statistical</td>
</tr>
<tr>
<td>Effort</td>
<td>Minimal</td>
<td>Considerable</td>
</tr>
<tr>
<td>Cost</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Vulnerability to bias</td>
<td>Yes</td>
<td>Less so</td>
</tr>
<tr>
<td>Reliability</td>
<td>Low, variable</td>
<td>High, consistent</td>
</tr>
<tr>
<td>Errors</td>
<td>Common</td>
<td>Few</td>
</tr>
<tr>
<td>Affective valence</td>
<td>Often</td>
<td>Rarely</td>
</tr>
<tr>
<td>Predictive power</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Hard-wired</td>
<td>May be</td>
<td>No</td>
</tr>
<tr>
<td>Scientific rigour</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Context</td>
<td>Specific</td>
<td>General</td>
</tr>
<tr>
<td>Context importance</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

Adapted from Dawson, Croskerry, and Evans
Diagnostic Schema Based on Dual Process Theory
Demonstrable (Implicit) Biases in the Medical Setting

- Gender
- Race/Ethnicity
- Obesity
- Psychiatric illness
- Age
- Socioeconomic status
- Sexual orientation
- Substance abuse disorders
- Chronic and complex illnesses

Implicit = biases an individual holds without being aware
Common Types of Cognitive Bias

- Anchoring*
  - “Fall in love with a diagnosis”

- Availability*
  - Based on recent experience

- Base-rate neglect
  - Rule out “worse case scenario”

- Diagnostic momentum
  - “Labeling”

- Heuristics
  - “Rule of thumb”

- Outcome bias

- Overconfidence bias
  - Trust in “opinion”

- Premature closure*

- Visceral bias

Large Group Share Activity

• Provide examples in which one or more cognitive biases were present for a particular case you were involved in or heard about
Small Group Activity

• Recognition of cognitive bias in case-based scenarios
• Review the clinical scenario at your table with your small group
• Discuss the type(s) of cognitive bias present
• Share with large group
Quote from Don Berwick

“Genius diagnosticians make great stories, but they don’t make great health care”
Can we learn from mistakes?

• If we understand how we think, we can improve how we think

• Accept responsibility for the mistake
  – More likely to make positive changes
  – More likely to have emotional distress (second victim syndrome)

• Discuss it with peers, trainees, etc.

• Disclose

Cognitive Tools

• Using ‘trigger tools’ in electronic health records to identify cases at high risk for diagnostic error

• Using standardized patients (secret shoppers) to study the rate of error in practice

• Encouraging both patients and physicians to voluntarily report errors they encounter, and facilitating this process

Graber, BMJ Qual Saf doi:10.1136/bmjqs-2012-001615
Mindfulness

• Remain alert to the influence of bias (mindfulness)
• Recognize implicit stereotypes
• Deliberate uncoupling from intuitive mode when a bias is identified
• Corrective “Mindware” to engage in analytic mode
Mindware

- Defined as the “rules, knowledge, procedures, and strategies that a person can retrieve from memory in order to aid decision making and problem solving.”

- Knowledge of the particular bias and strategies that can reduce or eliminate it

- Debiasing is not easy, no “one size fits all”, long term work
# De-biasing Strategies

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Mechanism/action</th>
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<tbody>
<tr>
<td>Develop insight/awareness</td>
<td>Understand the nature, limitations and operating characteristics of the two principal modes of thinking. Be aware that most biases occur in the intuitive mode. Provide detailed descriptions and thorough characterisations of known cognitive and affective biases, together with multiple clinical examples illustrating their adverse effects on decision making and diagnosis formulation.</td>
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<tr>
<td>Consider alternatives</td>
<td>Establish forced consideration of alternative possibilities, e.g. the generation and working through of a differential diagnosis. Encourage routinely asking the question: What else might this be?</td>
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<tr>
<td>Metacognition and reflection</td>
<td>Train for a reflective approach to problem solving: stepping back from the immediate problem to examine and reflect on the thinking process (analytical monitoring of intuition and double checking).</td>
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<tr>
<td>Decrease reliance on memory</td>
<td>Improve the accuracy of judgements through cognitive aids: mnemonics, clinical practice guidelines, algorithms, personal digital assistants.</td>
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<tr>
<td>Specific training</td>
<td>Identify quantitative flaws and biases in thinking and provide directed training to overcome them: e.g. instruction in fundamental rules of probability, distinguishing correlation from causation, basic Bayesian probability theory.</td>
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<tr>
<td>Simulation</td>
<td>Develop mental rehearsal, ‘cognitive walkthrough’ strategies for specific clinical scenarios to allow cognitive and affective biases to be made and their consequences to be observed and appreciated. Construct clinical training videos contrasting incorrect (biased) approaches with the correct (de-biased) approach.</td>
</tr>
</tbody>
</table>
## De-biasing Strategies

<table>
<thead>
<tr>
<th>Cognitive forcing strategies</th>
<th>Develop generic and specific strategies to avoid predictable bias in particular clinical situations. Promote use of forcing functions and checklists.</th>
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<tbody>
<tr>
<td>Make task easier</td>
<td>Gather more information about the specific problem to reduce task difficulty and ambiguity. Make available rapid access to concise, clear, well-organised information, e.g. medical history, discharge summaries, current medications.</td>
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<tr>
<td>Minimise time pressures</td>
<td>Provide adequate time for quality decision making. Minimise interruptions and distractions and other sources of attentional capture.</td>
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<tr>
<td>Accountability</td>
<td>Establish clear accountability and follow-up for decisions made. It should always be clear who is responsible for decisions that are made.</td>
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<tr>
<td>Feedback</td>
<td>Provide as rapid and reliable feedback as possible to decision makers so that errors are immediately appreciated, understood and corrected, resulting in better calibration of decision makers.</td>
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<tr>
<td>Maintain cognitive skills</td>
<td>Be aware that whatever higher level cognitive skills are acquired need regular rehearsal and maintenance. Clinicians should not trust themselves to stay up to date. Besides taking regular refresher courses to maintain knowledge currency, they should use external validation of cognitive skills and performance.</td>
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</tbody>
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Croskerry P, Nimmo GR. J R Coll Physicians Edinburgh. 2011
Debiasing Strategies

• What else could this be?
  – Could there be more than one diagnosis?
• What does not fit?
• Is there more than one diagnosis?
• Slow down/call a diagnostic timeout (Reflective practice)
• Avoid blind obedience by asking questions
• Am I comfortable with diagnosis, answering all parental questions and is parent comfortable with explanation?
How confident am I?
What data supports my diagnosis?

• Reason through each key data point to ensure it fits appropriately into the presumed diagnosis

• Step back from the immediate problem and ensure that all pieces of the puzzle align correctly
  – Avoids premature closing and anchoring biases

• Requires practitioner to “know limits” and have good fund of knowledge
What is the diagnosis I don't want to miss?

- Stop to ask what other diagnoses may exist
- Consider extreme circumstances, “worst case scenario”
- Feedback from specialists “poised to see” missed diagnosis
Individual Reflection Activity

• Using a cognitive bias example
  – From table
  – From own experience

• Begin reflection on mitigation strategies
  – What might have helped to prevent the outcome
  – What things will you do differently in the future

• Share with group
Curricular Activities for Trainees

- Self-reflection exercises; Mindfulness training
- Simulations
- Videos (http://www.youtube.com/watch?v=uHpieuyP1w0)
- Metacognitive skill training
- Small group sessions
  - Clinical case vignettes and facilitators
  - Think-aloud methodology
- Checklist development/instruction
- Reading assignments

General Checklist for Diagnosis

• Obtain your own complete history
• Perform a focused and purposeful physical exam
• Generate initial hypotheses & differentiate these with additional history, exam, & diagnostic tests

• Pause for reflection “Time out”
  – Was I comprehensive
  – Did I consider the inherent flaws of heuristic thinking
  – Was my judgment affected by any other bias
  – Do I need to make the diagnosis now, or can I wait
  – What is the worst case scenario
  – Embark on a plan, acknowledge uncertainty; follow up
Consultation and Referral EPA Functions

• Focus the clinical question
• Obtain essential information
• Engage in a thorough yet targeted evaluation
• Acknowledge one's limitations in the scope of practice
• Collaborate with and manage expectations of patients, families, and the health care team
• Help patients & families deal with the uncertainty in the diagnosis and/or prognosis that requires the engagement of the consultant
Consultation and Referral EPA Mapping

- **Domains of Competence**
  - Patient care
  - PBLI
  - ICS
  - SBP
  - PPD

- **Competencies**
  - PC 6*
  - MK 2 (PBLI 6)
  - PBLI 1*
  - ICS 3, 4, 5
  - SBP 2
  - PPD 8*
<table>
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<tr>
<td><strong>PC 6</strong> Make informed diagnostic and therapeutic decisions that result in optimal clinical judgment</td>
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<tr>
<td><strong>PBLI 1</strong> Identify strengths, deficiencies, and limits in one’s knowledge and expertise</td>
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<tr>
<td><strong>ICS 3</strong> Communicate effectively with physicians, other health professionals, and health related agencies</td>
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<tr>
<td><strong>ICS 4</strong> Work effectively as a member or leader of a health care team or other professional group</td>
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<tr>
<td><strong>ICS 5</strong> Act in a consultative role to other physicians and health professionals</td>
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<tr>
<td><strong>PPD 8</strong> Recognize ambiguity is part of clinical medicine and respond by using appropriate resources in dealing with uncertainty</td>
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General Checklist for Diagnosis

• Obtain your own complete history (PC 6)
• Perform a focused and purposeful physical exam (PC 6)
• Generate initial hypotheses & differentiate these with additional history, exam, & diagnostic tests (PC 6, ICS 3)
General Checklist for Diagnosis

• Pause for reflection “Time out”
  – Was I comprehensive (PC 6)
  – Did I consider the inherent flaws of heuristic thinking (PBLI 1)
  – Was my judgment affected by any other bias (PBLI 1)
  – Do I need to make the diagnosis now, or can I wait (ICS 4,5)
  – What is the worst case scenario (PPD 8)
  – Embark on a plan, acknowledge uncertainty; follow up (PPD 8, SBP 2)
Lessons Learned

• Being aware of human tendencies can help avoid pitfalls

• Everyone is susceptible to errors in thinking, some conditions make errors more likely
  – High stress
  – High uncertainty
  – Little time