Clearing the error: Identifying trainee cognitive bias to reduce diagnostic error

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Learning Objectives

• Describe the relationship between cognitive bias and diagnostic error in medicine.

• Apply knowledge of at least four types of cognitive bias to example clinical cases.

• Formulate an approach to providing constructive feedback to trainees in cases of potential cognitive bias.
Outline

1. Experience it
   a) Introduction to Cognitive Bias
   b) The 3 R’s: How to approach trainees in cases of cognitive bias
   c) Breakout: Small Groups
2. Think about ways to use it
3. Take it home
Which one is the real penny?
Improving Diagnosis in Healthcare

• The failure to establish an accurate and timely explanation of the patient’s health problem(s)

• Communicate that explanation to the patient.

Most people will experience at least one diagnostic error in their lifetime.
Systems vs. Cognitive Errors

• Purely systems-based errors generally lead to imperfect delivery of a well-chosen care plan.
  • Without the systems problem the patient would have done well.

• Purely cognitive errors are thinking flaws that more likely lead to an error in diagnosis.
  • Even if the plan was carried out perfectly, it might not have been the correct plan!

• Real world errors are often a mix
• Lack of feedback about diagnostic process
Diagnostic Error Causes
Heuristics and Cognitive Bias

- **Heuristics**
  - Brain’s short cuts
  - Speed up the process

- **Cognitive bias**
  - Psychological tendencies for brain to draw the incorrect conclusion
  - 30+ described in medicine
Diagnostic Error in Residency

- UPenn Internal Medicine Residents¹
  - 100% reported a case of diagnostic error or delay in diagnosis due to cognitive bias
  - Anchoring most common (87.8%)

- Trainees may be especially susceptible

- Educational interventions in recognizing and mitigating cognitive bias improve resident critical thinking skills.²

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"If there's something you really want to believe, that's what you should question the most."

Penn Jillette
Ascertainment Bias

- “Seeing what you expect to find”
- Stereotyping
• Diagnostic labels stick to patients

• “Chart Lore”

Diagnostic Momentum
- First impressions
- Create grounding

Anchoring
Which is Deadlier?

1 in 251,800,000

VS

1 in 112,000,000
• “Common things are common”
• Recency effect
• Judged to be more likely if readily comes to mind

Availability Bias
Confirmation Bias

- Following hunches
- Overvalue supporting evidence rather than disconfirming evidence for a diagnosis

Everything you look for and all that you perceive has a way of proving whatever you believe.
Hindsight Bias

- Knew it all along
- Second guess decisions with all the information
• Counting chickens before they hatch

• Diagnosis accepted before it has been fully verified
Imagine these presentations

- A 65 yo homeless male presents with shortness of breath...
- A 65 yo long-time smoker presents with shortness of breath...
- A 65 yo male with CAD, CHF, DM, PVD, HTN, HLD presents with shortness of breath...

Framing effect
• Different context of presentation changes decision making

Framing effect
Mitigating bias in the training environment
The Three R’s

- Recall
- Recognize
- Revisit
The Three R’s

Recall
• Trainee thinks through process that led them to diagnosis

Recognize

Revisit
Recall

Recognize
• Attending assists trainee in recognizing possible bias in reasoning

Revisit
Example: Confirmation bias

- Were there available data that would have pointed you in a different direction or go against the diagnosis you made?

- How did you interpret all of the available data points?
The Three R’s

Recall

Recognize

Revisit

- Attending and trainee develop at least one strategy to mitigate bias in future similar case
The Three R’s

Recall
• Trainee thinks through process that led them to diagnosis

Recognize
• Attending assists trainee in recognizing possible bias in reasoning

Revisit
• Attending and trainee develop at least one strategy to mitigate bias in future similar case
Case Discussion
Case 1

2 minutes: Identify biases present
8 minutes: counsel your trainee

Potential types of bias:
- Confirmation bias
- Framing effect
- Premature closure
- Diagnostic momentum

! Remember !

Don’t get caught up in medical aspects of case.
Case 1: Debrief

• Potential types of bias:
  • Confirmation bias
  • Framing effect
  • Premature closure
  • Diagnostic momentum
Case 2

2 minutes: Identify biases present
8 minutes: counsel your trainee

- Potential types of bias:
  - Anchoring
  - Ascertainment bias
  - Fundamental attribution error
  - Overconfidence Bias

! Remember!
Don’t get caught up in medical aspects of case.
Case 2: Debrief

- Potential types of bias:
  - Anchoring
  - Ascertainment bias
  - Fundamental attribution error
  - Overconfidence bias
Implementation
Discussion questions

• How could you implement similar teaching into your educational program?

• What cognitive bias teaching already exists at your institution?

• What are barriers to implementation?

• What are opportunities for growth?
Where to begin?

- Start with a single session and build consistently

- Longitudinal and integrated curricula likely:
  - Improve cognitive bias awareness
  - Improve reflective practice

Take-home points

• Diagnostic error is common – cognitive bias likely contributes
• Educating residents about cognitive bias improves critical thinking skills
• The 3 R’s can help you to guide trainees in using metacognition to mitigate future cognitive bias
  • Recall
  • Recognize
  • Revisit
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