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

Emily Fondahn, MD, FACP
Amber Deptola, MD
Michael DeVita, MD

Department of Medicine
Division of General Medicine

In collaboration with:

VA | U.S. Department of Veterans Affairs

Financial Disclosures

- Dr. Fondahn is a peer reviewer for Greeley Company

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?

1

2

3

4

5

6

7

8

9

10

11

12

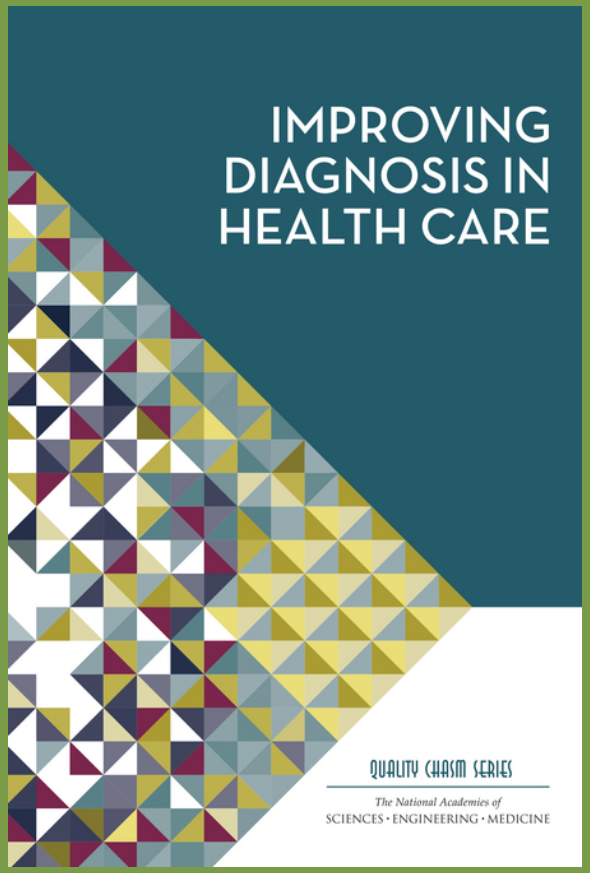
13

14

15

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


PA

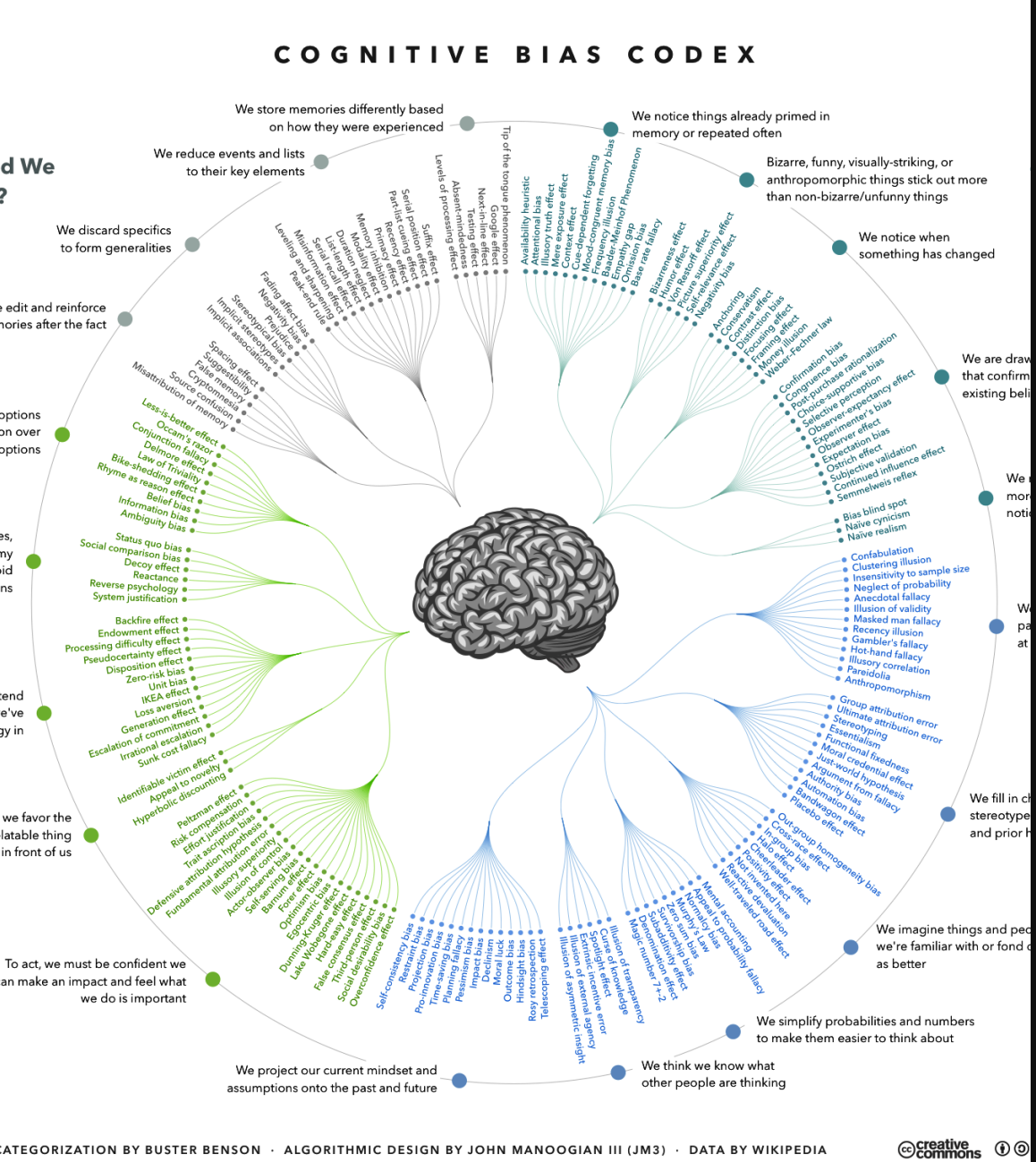
Diagnostic Error in Residency

- UPenn Internal Medicine Residents[1]
  - 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]

1. Ogdie AR, et al. Seen through their Eyes: Residents' Reflections on the Cognitive and Contextual Components of Diagnostic Errors in Medicine. Academic Medicine. 2012; 87(10): 1361-1367.
2. Royce CS, Hayes MM, Schwartzstein RM. Teaching Critical Thinking. A Case for Instruction in cognitive Biases to Reduce Diagnostic Errors and Improve Patient Safety. Academic Medicine. 2019;94(2):187-194.



Types of cognitive bias

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

Penn Jillette

- "Seeing what you expect to find"
- Stereotyping

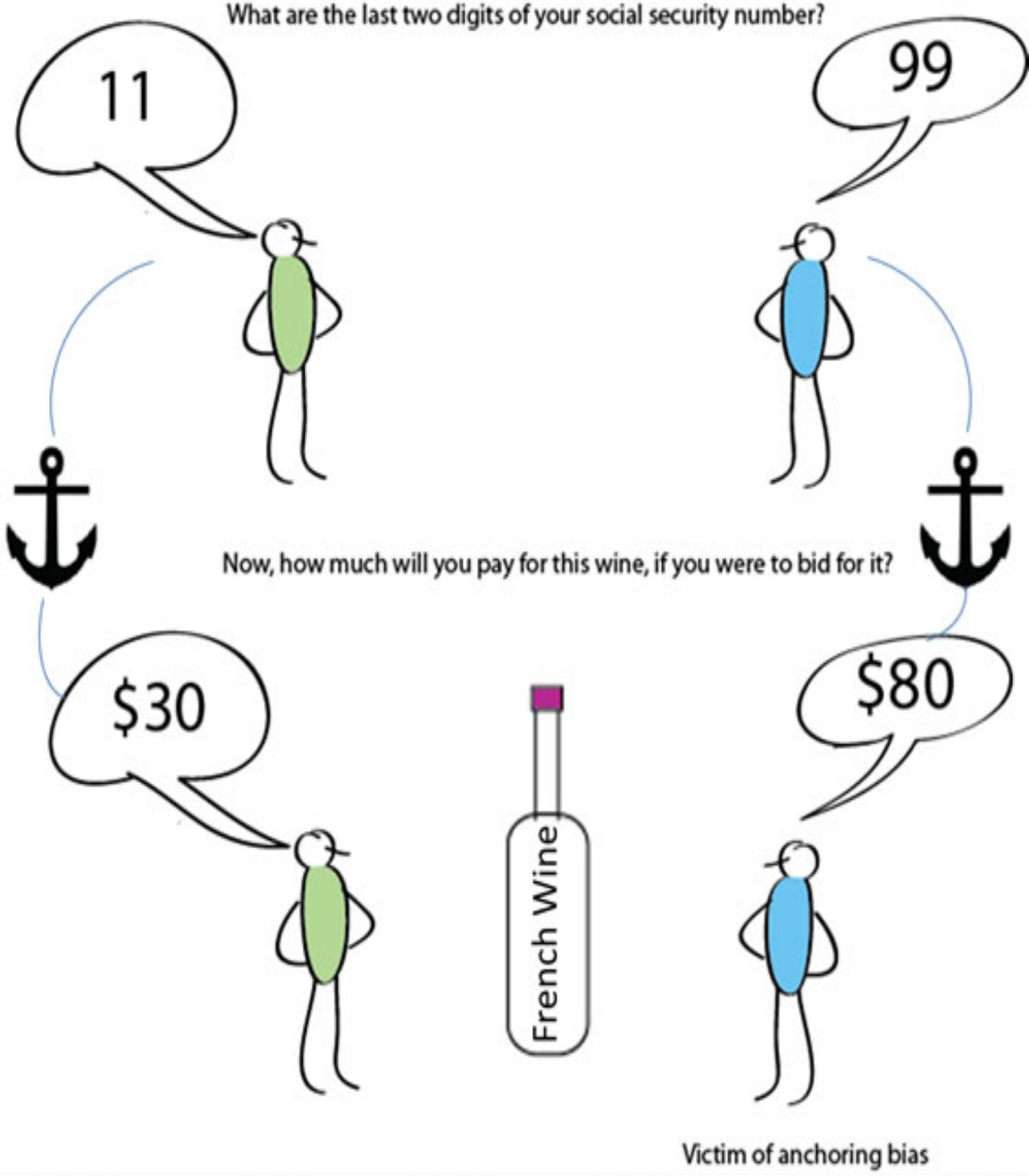
Ascertainment Bias

- Diagnostic labels stick to patients
- "Chart Lore"

Diagnostic Momentum

- First impressions
- Create grounding

Anchoring



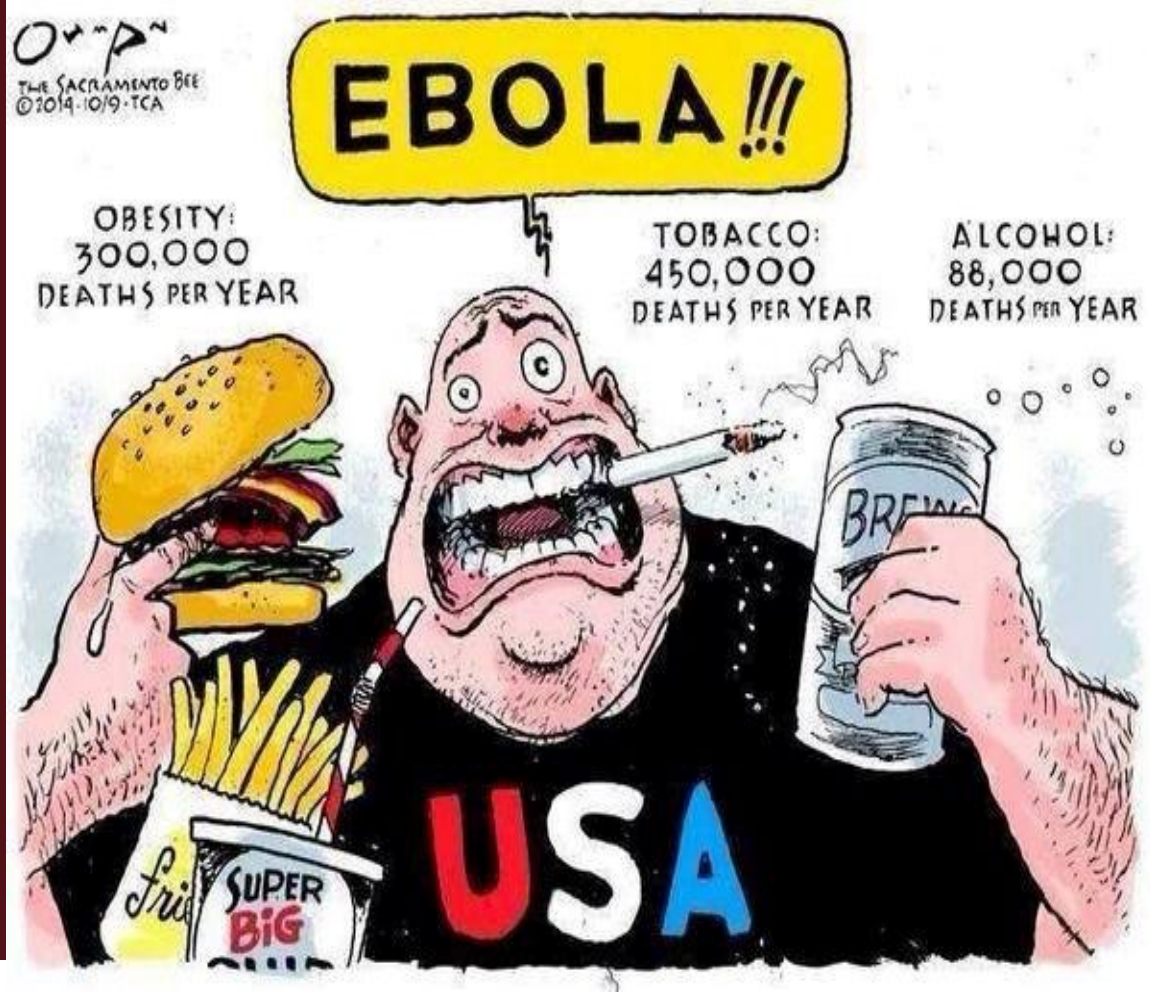
Which is Deadlier?

VS

1 in 251,800,000

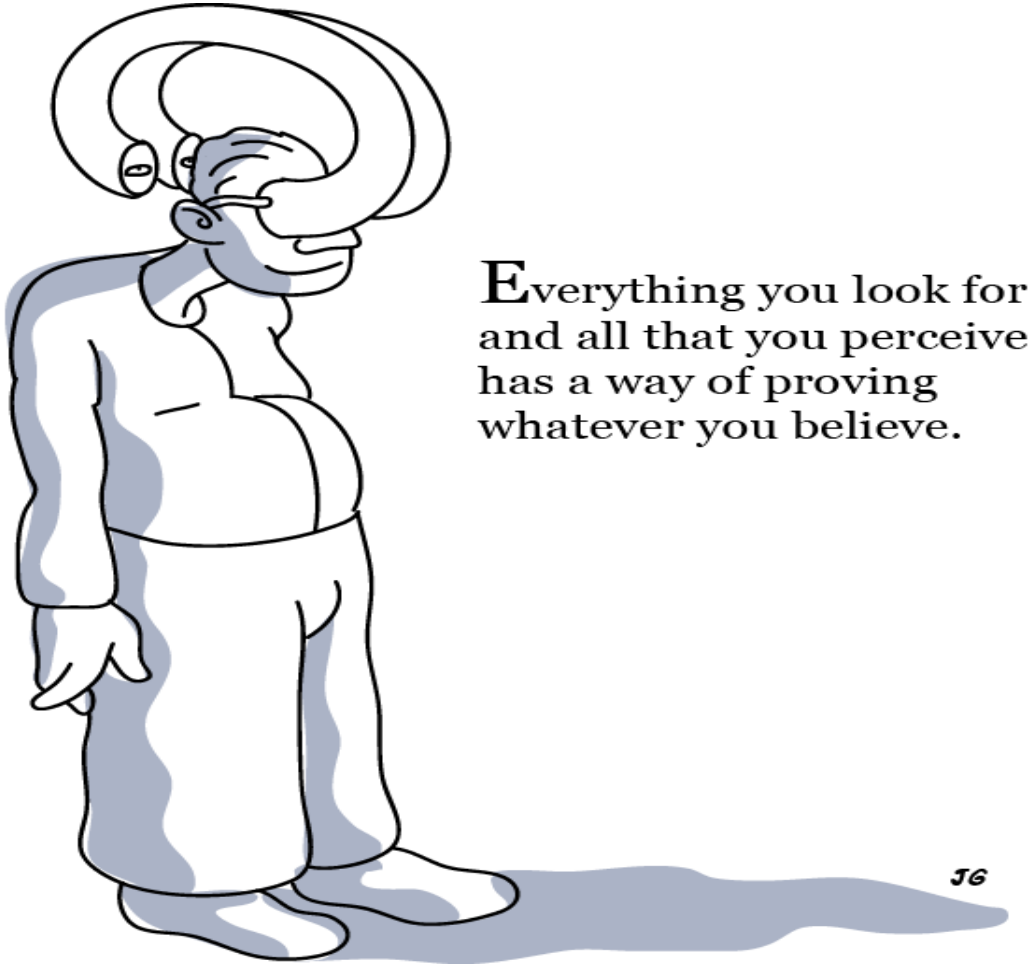
1 in 112,000,000

- "Common things are common"
- Recency effect
- Judged to be more likely if readily comes to mind



Availability Bias

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



Confirmation Bias

- Knew it all along
- Second guess decisions with all the information

Hindsight Bias

- Counting chickens before they hatch
- Diagnosis accepted before it has been fully verified

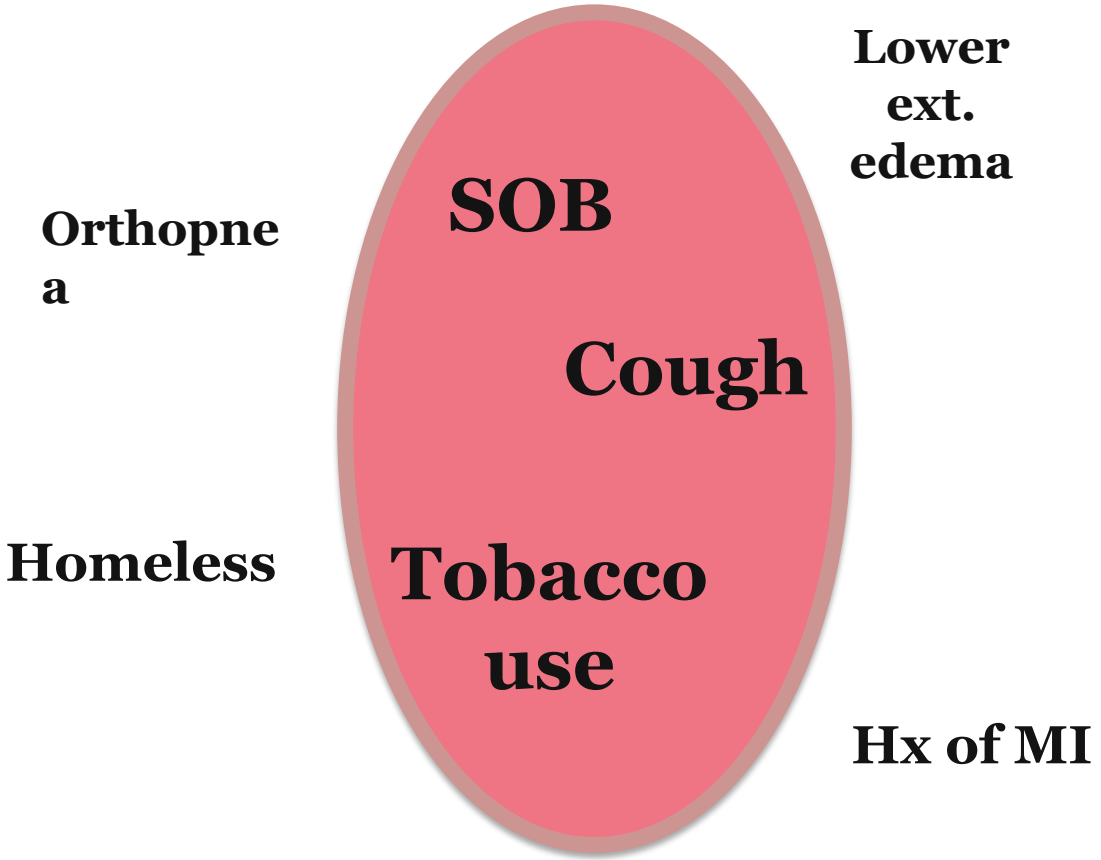
Premature Closure

Imagine these presentations

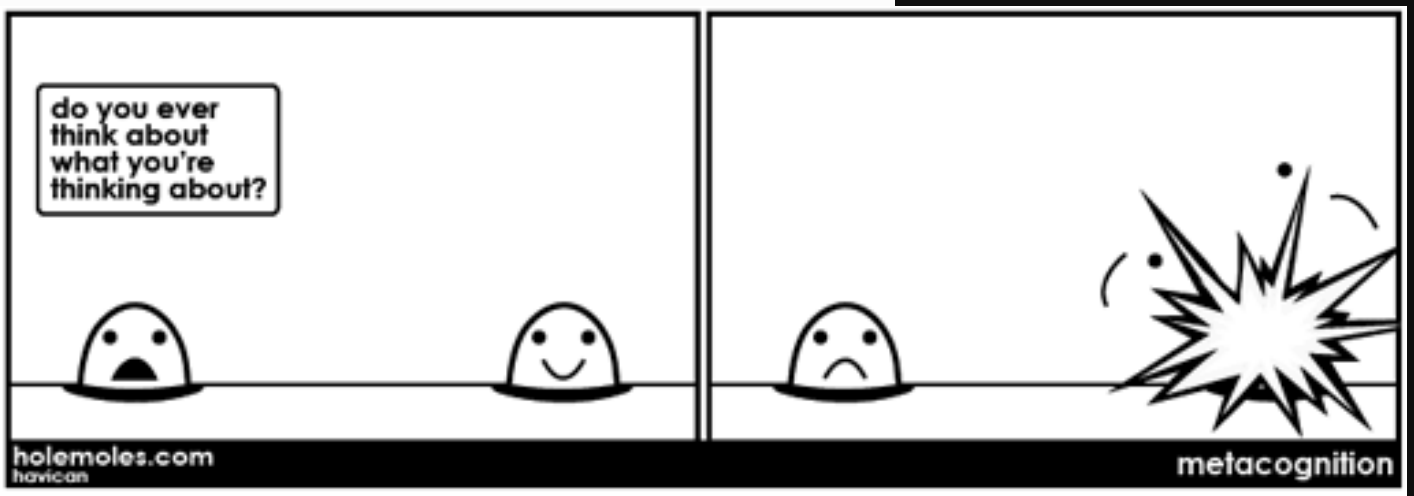
- A 65 yo homeless male presents with shortness of breath…
- A 65 yo long-time smoker presents with shortness of breath…
- A 65 yo male with CAD, CHF, DM, PVD, HTN, HLD presents with shortness of breath…

Framing effect

- Different context of presentation changes decision making

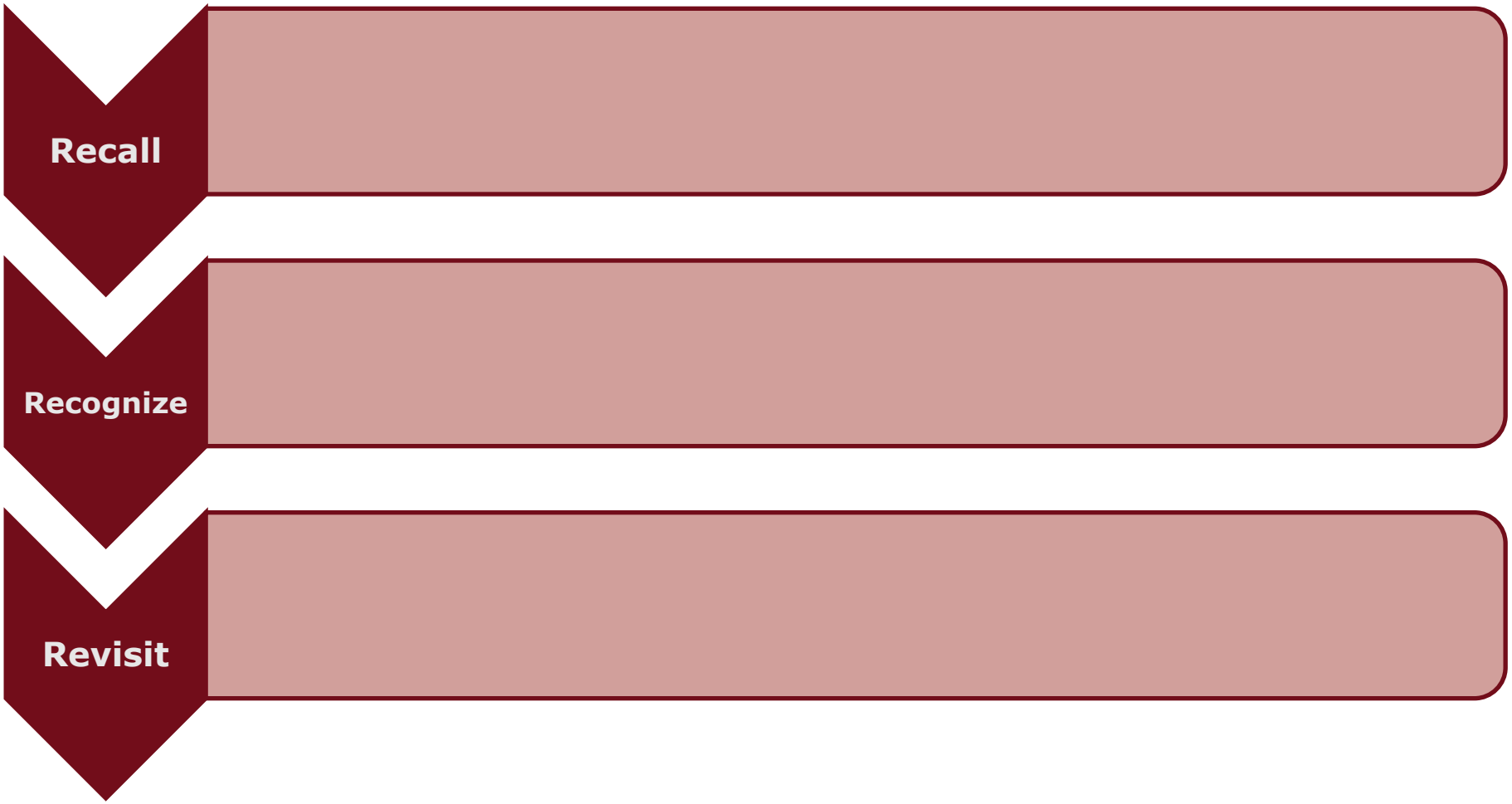


Framing effect



Mitigating bias in the training environment

The Three R's



The Three R's

Recall

- Trainee thinks through process that led them to diagnosis

Recognize

Revisit

The Three R's

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

Royce CS, Hayes MM, Schwartzstein RM. Teaching Critical Thinking. A Case for Instruction in cognitive Biases to Reduce Diagnostic Errors and Improve Patient Safety. Academic Medicine. 2019;94(2):187-194.

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

Michael DeVita, MD
Assistant Professor of Medicine

mddevita@wustl.edu

Emily Fondahn, MD, FACP
Associate Professor of Medicine

efondahn@wustl.edu

Amber Deptola, MD
Assistant Professor of Medicine

amberzdeptola@wustl.edu