Teaching Sound
Diagnostic Reasoning
A Cognitively-Based 6-Step Approach

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Goal: Improve Our Teaching

• Objectives:
• Differentiate between intuitive and analytic reasoning
• Recognize common cognitive biases that affect diagnostic reasoning in self, trainees & students
• Employ 6 steps to help teach sound diagnostic reasoning
You will see an image
Shout out the answer as quickly as you can
Dual-Process Theory of Cognition

CASE

RECOGNIZED

Intuitive

Automatic
Fast

Calibration

Diagnosis

Analytical

Deliberate
Slow

NOT RECOGNIZED
Let’s Think About Intuitive Reasoning!

• Turn to your neighbor & discuss

• Think about diagnosis made confidently & immediately

• What factors were at play?
Heuristics & Biases

• Heuristics
  – Cognitive short-cuts or rules of thumb
  – Evolutionarily adaptive
  – Often accurate, but contextually-dependent

• Bias = inappropriately applied heuristic
Heuristics & Biases

- Availability
- Representativeness
- Anchoring
- Affective
Availability Heuristic

• Diagnosis considered more likely if more easily retrievable from memory

• “Looking for zebras”
Representativeness Heuristic

- Diagnosis considered more likely if similar to previous cases
- “Missing zebras or atypical cases”
Anchoring Heuristic

• Initial information influences subsequent reasoning & decisions

• Framing effect

• Premature closure
Affective Heuristic

• Diagnosis considered more likely because of “gut response”

• Can be influenced by:
  – Patient
  – Family
  – Stress
  – Hunger
  – Sleep deprivation
Highlighting Intuitive Reasoning

Automatic & Fast Heuristics
Highlighting Analytical Reasoning

CASE

NOT RECOGNIZED

Analytical

Deliberate Slow

Calibration

Diagnosis
Pitfalls of Analytic Reasoning

• Slow

• Labor-intensive

• Inefficient

• “Missing the forest for the trees”
Dual-Process Theory of Cognition

Intuitive

Automatic & Fast Heuristics

Analytical

Deliberate Slow

CASE

RECOGNIZED

NOT RECOGNIZED

Calibration

Diagnosis
Comparison

Novice

Expert
Six Steps to Help Teach Sound Diagnostic Reasoning
Step 1 – Engage Intuitive Reasoning

• “What is your leading diagnosis?”

• “Give me a top 3-5 differential diagnosis?”
Step 2 – Confirm Accurate Intuitive Reasoning

- “Why does your diagnosis fit?”
- “Why do you think that’s correct?”
Video
Step 3 – Engage Analytic Reasoning

• “Let’s take a time out.”

• “What doesn’t fit?”

• “Let’s start with a blank slate.”

• “What if...?”
Step 4 – Stuck? Build on Prior Knowledge

• “Tell me about other patients that you’ve seen like this before.”

• “Tell me what you have been taught/learned before about this.”
Step 5 – Promote Self-Directed Learning

• “What else do you need to learn about this?”

• “What is the evidence? How does it apply?”
Step 6 – Provide Feedback & Think Aloud

• Name it as feedback!

• Highlight what was done well and why

• Explain your thinking process, if needed

• Discuss what may be helpful for future situations
  – When heuristics are being used
  – Potential for bias
Engaging both types of reasoning is important.
Teaching Sound Diagnostic Reasoning

• Engage intuitive reasoning
• Confirm accurate intuitive reasoning
• Engage analytic reasoning – take a time out!
• Stuck? Build on prior knowledge
• Promote self-directed learning
• Provide feedback & think aloud
Questions, Feedback or Comment?
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