Symposium S055: Optimize Your Practice: Getting It Right and Loving Your Job!
Know Thyself: Preventing Cognitive Errors in Dermatology

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How Doctors Think
Jerome Groopman, MD
Houghton Mifflin Company Boston 2008

• ERRORS in Medicine
  - Technical
  - Cognitive (Mistake in Thinking)
• Cognitive errors tend to occur subconsciously.
• Becoming aware of our cognitive biases is the first step toward preventing them.
• This concept of recognizing our tendency for biased thinking and actively preventing them is called cognitive debiasing.

Cognitive errors

- **Consensus** is that most errors cognitive & result from one or more **cognitive biases**.
  - Biased reasoning usually associated with ‘System 1’ (non-analytic, pattern recognition) thinking.

Norman G, Eva K/ Medical Education 2010: 44: 94-100

**Observations and Deductions---**

- Our Experiences, Perceptions and Judgments lead us to BIASED thinking
DANIEL KAHNEMAN'S SYSTEMS OF THINKING

SYSTEM 1 THINKING
- INSTINCTIVE
- QUICK
- LITTLE/NO EFFORT
- EMOTIONAL
- NO SENSE OF VOLUNTARY CONTROL
- AUTOMATIC

SYSTEM 2 THINKING
- COMPLEX DECISIONS
- SLOWER
- CONSCIOUS
- EFFORTFUL
- MORE LOGICAL
- MORE DELIBERATIVE

https://journal.thriveglobal.com/how-to-naturally-improve-your-brain-and-elevate-your-performance-559ac2ef3397
Individual personality influences clinical reasoning and decision making
(Croskerry and Musson, 2009)

- Arrogance → clinician overconfidence, personality trait identified as source of diagnostic error

- Openness to experiences & agreeableness could improve decision making in some if it increases openness to divergent views and feedback.

- (Berner and Graber, 2008; Croskerry and Norman, 2008).
• Diagnostic errors can lead to patient harm but have received inadequate exploration relative to other patient safety concerns. **Physician overconfidence is thought to be one of many contributing factors to diagnostic error** and occurs when the relationship between accuracy and confidence is miscalibrated or misaligned such that **confidence is higher than it should be.**
Yerkes-Dodson law on task performance

- Psychologists Robert M. Yerkes and John Dillingham Dodson in 1908.
- “...performance increases with physiological or mental arousal, but only up to a point.”
Fine Line between Confidence -- Overconfidence

- Maybe should expand:
  Level of Complacency

  Degree of
  - Comfort
  - Attention
  - Concern
  - Conscientiousness

- Level of Speed/Efficiency
- Level of Stress
Yerkes-Dodson law on task performance

- Optimal arousal
- Optimal performance

Termed “Productive Anxiety”
Impaired performance because of strong anxiety

Increasing attention and interest

Arousal

Performance

Strong

Weak

Low

High

https://images.search.yahoo.com/yhs/search;_ylt=A0LEViPKCr1WKbsAJHlIlQ;_ylu=X3oDMTEyZG12NHM5BGNvbGQyMgMzNlc3NhZ3Rd?p=Yerkes+Dodson+Curve&fr=yhs-mozilla-003&hspart=mozilla&hsimp=yhs-003
“Misdiagnosis”

• Different than “Mistake”
• Window into medical mind
  - Reveals:
    ▪ Why doctors fail to question assumptions
    ▪ Why thinking sometimes closed or skewed
    ▪ Why they overlook gaps in their knowledge

» Groopman, How Doctors Think
Misdiagnosis

Association of Dermatology Consultation With Accuracy of Cutaneous Disorder Diagnoses in Hospitalized Patients: A Multicenter Analysis
JAMA Dermatol 2016 Jan 13; D Kroshinsky, J Cotliar, LC Hughey, K Shinkai, LP Fox

- Retrospective, Multi-institutional cohort study
- 4 Dermatology Consult Teams
- Dermatology Consultation Changed Final Diagnosis in 71% of Consultation requests
So, To Reiterate: Cognitive errors

- Consensus is that most errors cognitive & result from one or more cognitive biases - “Cascade” often seen
  - Biased reasoning usually associated with ‘System 1’ (non-analytic, pattern recognition) thinking.

Observations and Deductions---
- Our Perceptions and Judgments lead us to BIASED thinking

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Cognitive Errors -- Most Common Biases

- Anchoring
- Attribution
- Availability
- Diagnosis Momentum
- Confirmation Bias

Groopman: How Doctors Think
Anchoring

- **Shortcut** in thinking (System 1)
- Person does **not** consider multiple possibilities
- Quickly and **firmly** latches onto a single one
- **Confirmation Bias**
  - See only the landmarks you expect to see and neglect those that contradict what you don’t
Attribution Error

- Attribute signs & symptoms to wrong cause
- Thinking guided by prototype
- Affected by emotional factors (Patient’s personal history, appearance, or actions)
- Fail to consider possibilities that contradict prototype
- Form of jumping to conclusion
Availability Error

- The tendency to judge the likelihood of an event by the ease with which relevant examples come to mind
Errors

• Diagnosis Momentum
  - One diagnosis fixed in Doctor’s mind passed to peers and subordinates
  - Accepted when seen at Tertiary Care Center
  - Make undefined condition conform to a well-defined prototype
First Question: **What else could it be?**
- This allows us to unhinge if we have anchored, to move away from a dramatic memory in the setting of availability, and to reduce the impact of stereotype in the setting of attribution error.

Second Question: **Does anything not fit?**
- This is a safeguard against confirmation bias. Review a contradictory or discrepant finding rather just dismiss it as an outlier and irrelevant.

And last: **Could there be more than one process at work?**
- This contradicts Ockham's razor. Always consider whether there may be more than one illness contributing what we see so we are not too quickly satisfied in our search.

Each of these questions helps us to keep an open mind.
It’s not over ‘til it’s over.

Yogi Berra

Thank you for your attention
And enjoy helping people