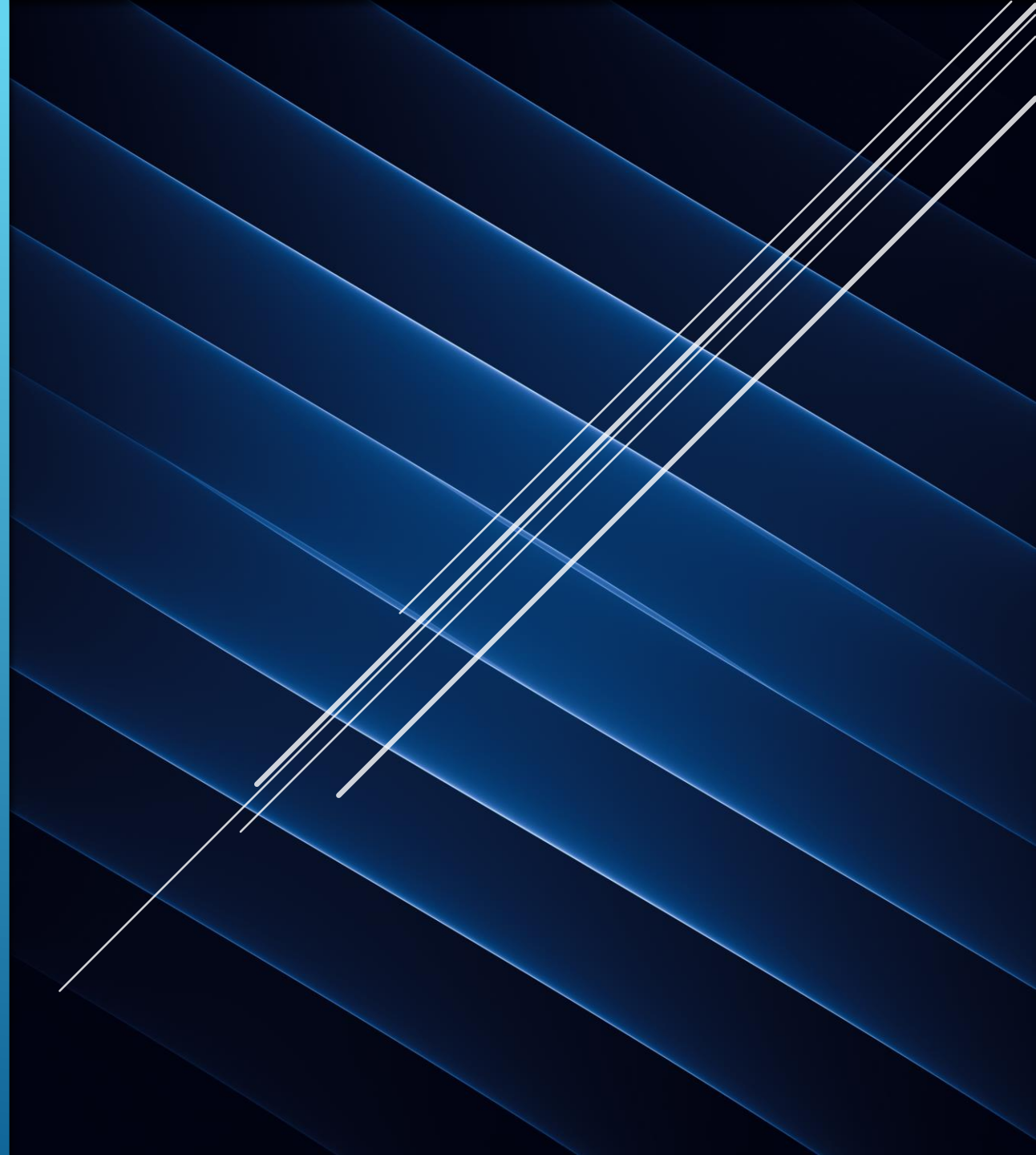


BIAS IN CLINICAL DECISION- MAKING

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DISCLOSURES

Dr. Herr does not have relevant financial relationships with any commercial interests.

EDUCATIONAL OBJECTIVES

Examine the dual process model for decision-making and the role that bias plays

Describe and give examples of several clinically important types of cognitive bias

Identify strategies to help reduce the impact of biases in clinical decision-making

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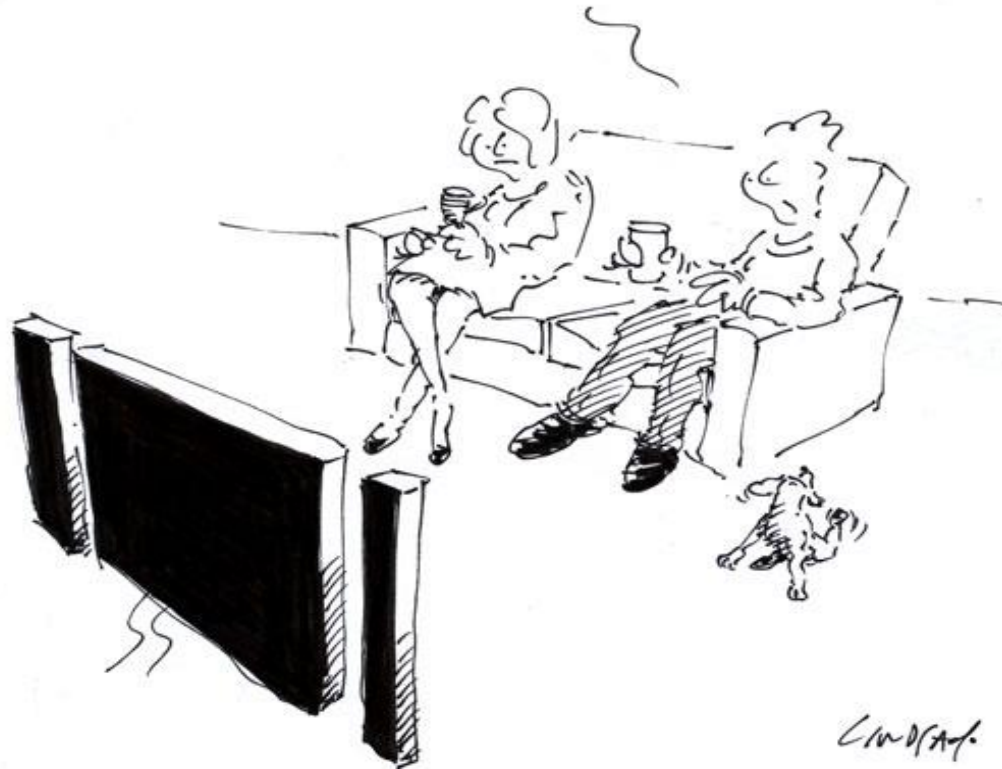
EVERYTHING YOU LOOK FOR AND ALL THAT
YOU PERCEIVE HAS A WAY OF PROVING
WHATEVER YOU BELIEVE.

”

-ANONYMOUS

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FUNNY HOW IT'S ONLY THE PEOPLE
I DISAGREE WITH WHO ARE BIASED



.....AND WRONG!

The Dual-Process Model of Reasoning

SYSTEM 1 (HEURISTIC): INTUITIVE, **FAST, EASY**

- BASED ON PERSONAL BELIEFS, JUDGEMENTS, PREFERENCES
- ACCURATE FOR MANY DECISIONS, BUT VULNERABLE TO VARIOUS **COGNITIVE BIASES**

SYSTEM 2: (ANALYTIC), SLOW, TAKES EFFORT

- BASED ON SCIENCE, RATIONAL

(HUMANS PREFER SYSTEM 1 PROCESSING WHENEVER POSSIBLE)

FROM "THINKING, FAST AND SLOW" BY DANIEL KAHNEMAN

What is Hueristic?

HUERISTIC (ADJ): FROM THE GREEK LANGUAGE,
MEANING TO FIND OUT OR DISCOVER

HUMAN BEINGS PROCESS CHUNKS OF EXTERNAL
INFORMATION AND MAKE COUNTLESS CHOICES
WITHIN A *FINITE AMOUNT OF TIME*.

BUT WHEN INFORMATION IS MISSING AND
MAKING AN URGENT DECISION IS ABSOLUTELY
NECESSARY, **HEURISTICS** PLAY A ROLE AS THE
FAMOUS '**RULES OF THUMB**'. THIS ENSURES YOU
MAKE *GOOD-ENOUGH CHOICES WITHIN A
LIMITED TIME FRAME*.

*FROM HARAPPA.EDUCATION WEBSITE

System 1 (Hueristic) Processing

NOT NECESSARILY BAD AND OFTEN NECESSARY
(EXAMPLES: *WHEN? WHERE?*)

SUSCEPTIBLE TO COGNITIVE BIAS WITH RESULTANT
DECISION AND DIAGNOSTIC ERRORS.

**FROM "THINKING, FAST AND SLOW" BY DANIEL KAHNEMAN*

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A CONFLICT OF THE TWO SYSTEMS

A BASEBALL BAT AND A BALL COST \$1.10. THE BAT COSTS \$1 MORE THAN THE BALL. **HOW MUCH DOES THE BALL COST?**

*FROM "THINKING, FAST AND SLOW" BY DANIEL KAHNEMAN

HASTY DECISIONS CAN SOMETIMES BE WRONG

IF YOUR INSTANT ANSWER IS \$0.10, I'M SORRY TO TELL YOU THAT SYSTEM 1 JUST TRICKED YOU.

THE BALL COSTS \$0.05.

WHEN SYSTEM 1 FACES A TOUGH PROBLEM IT CAN'T SOLVE, IT'LL CALL SYSTEM 2 INTO ACTION. SOMETIMES, HOWEVER, YOUR BRAIN PERCEIVES PROBLEMS SIMPLER THAN THEY ACTUALLY ARE. **SYSTEM 1 THINKS IT CAN HANDLE IT, EVEN THOUGH IT ACTUALLY CAN'T, AND YOU END UP MAKING A MISTAKE.**

**FROM "THINKING, FAST AND SLOW" BY DANIEL KAHNEMAN*

SYSTEM I AND BIAS



What is (Medical) Bias?

A BIAS IN EVIDENCE-BASED MEDICINE IS
***ANY FACTOR THAT LEADS TO CONCLUSIONS
THAT ARE SYSTEMATICALLY DIFFERENT
FROM THE TRUTH.***

JUSTIN MORGENSTERN, FIRST 10EM, [JULY 2, 2018](#)

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Clinicians are subject to the same errors in thinking that affect virtually all people. In particular, practitioners must be wary of (a) the misuse of certain heuristics (e.g., availability, representativeness) and (b) cognitive biases (e.g., confirmation bias, hindsight bias) in their everyday work.

(The Encyclopedia of Clinical Psychology, First Edition. Edited by Robin L. Cautin and Scott O. Lilienfeld. © 2015 John Wiley & Sons, Inc.)

*...WE USE READILY AVAILABLE STORED INFORMATION IN OUR
BRAINS WITH THEIR ASSOCIATED CONNECTIONS AND BIASES
TO MAKE DECISIONS EVERY DAY.*

IMPLICIT VS COGNITIVE BIAS



IMPLICIT BIAS (STEREOTYPING)

Implicit biases are present in all individuals, even those who do not exhibit overt discrimination. Implicit biases are a product of the society in which we grow up and affect not only how we perceive patients but also how we perceive colleagues.

A person may believe they treat everyone equally, however, the person's implicit bias may cause unconscious negative or positive associations toward certain groups of people.




GENDER BIAS: AN EXAMPLE OF IMPLICIT BIAS

COGNITIVE BIAS

Cognitive biases are psychological tendencies that can cause the human brain to draw incorrect conclusions.

Cognitive bias is a mistake in reasoning, evaluating, remembering, or other cognitive process, often occurring as a result of holding onto one's preferences and beliefs regardless of contrary information.

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Cognitive bias is not an illness. It's not something that is bad or people should be judged as bad for having," says **Geri Amori**, PhD, vice president of academic affairs at Coverys.


”

It is a normal thought process in all human beings. It's inherent in everything that each of us does daily.



BIAS: COGNITIVE VS IMPLICIT

Cognitive biases generally apply to how we use clinical data, while implicit biases color how we use that data through the lens of an individual patient's personal characteristics, such as age, race, gender, and socioeconomic status.

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Mr. W, age 50, black male

Booked December 26

Charges: Domestic Violence

Died in custody 8 days after booking

3 Previous bookings: Drug possession, DV

(What biases affected the decisions in his care?)

IMPORTANCE OF COGNITIVE BIAS

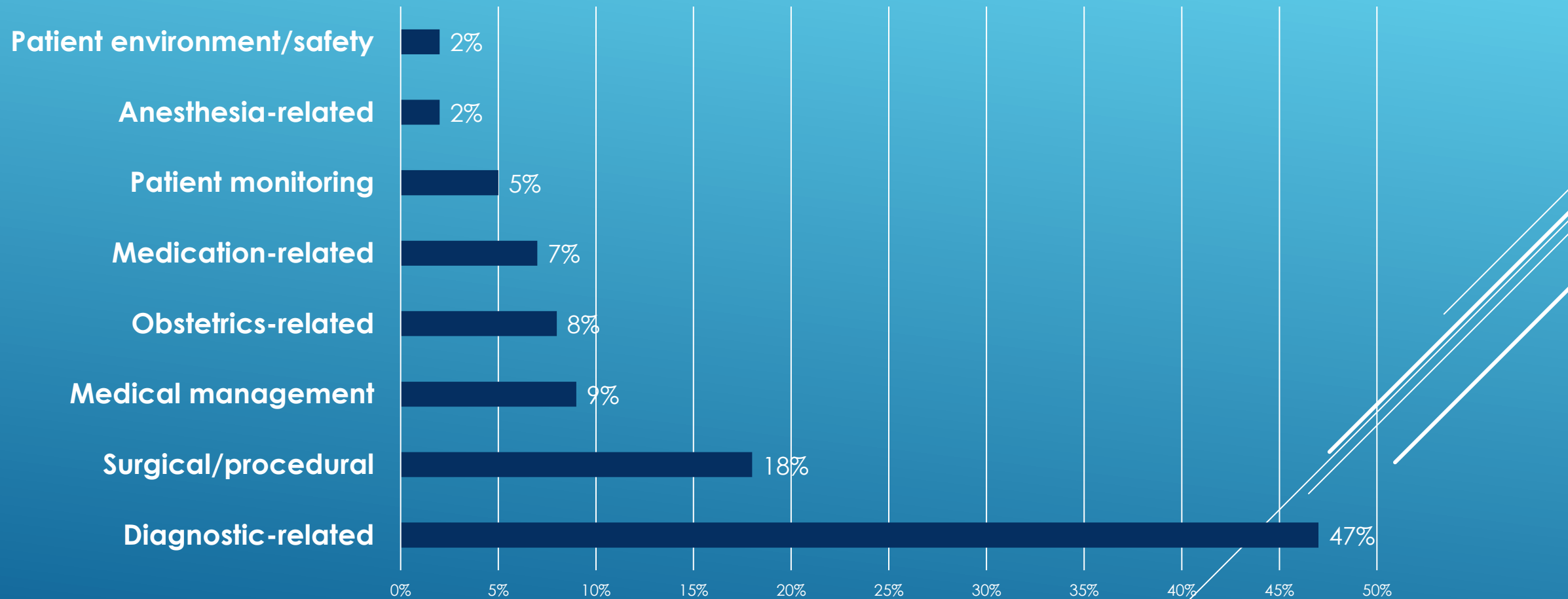
The National Academy of Medicine recently reported that most people will receive an incorrect or late diagnosis at least once in their lives. In one estimate, **12 million people** or 5% of adults who seek outpatient care are misdiagnosed annually.

Various issues affect diagnostics errors, including failure to make timely referrals, misinterpretation of clinical exam and test findings, narrow diagnostic focus and inadequate testing.

Diagnostic-related failures are cited as the single-largest root cause of claims.

Cognitive biases, often in conjunction with provider personality traits (aversion to risk or ambiguity), ***can ultimately lead to missed or inaccurate diagnoses.***

LEADING CAUSES OF MEDICO-LEGAL CLAIMS



Source: Convery, "Diagnostic Accuracy: Room for Improvement"

A FEW COMMON COGNITIVE BIASES

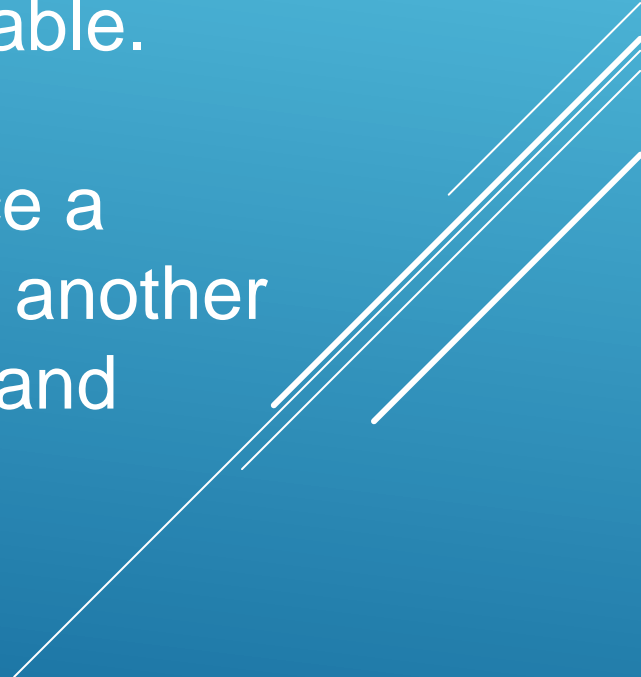
Table. Definitions of Selected Cognitive Biases

Cognitive Bias	Definition/Description
Affective bias ^{1,7}	This occurs when emotions about a patient or situation interfere with objective reasoning and decision making.
Anchoring ^{1,2,4,5}	This occurs when aspects of the initial information obtained about a patient lead to a premature conclusion before sufficient information is available to permit a logical conclusion.
Availability bias ^{1,2,5,6}	This occurs when a diagnosis is based on what readily comes to mind, either because the latter is common or was recently encountered.
Confirmation bias ^{1,4-6}	The tendency to seek and consider only information that confirms one's beliefs. This creates resistance to reconsidering a diagnosis even when more compelling evidence of another diagnosis is available.
Diagnosis momentum ^{1,4}	A tendency to reinforce a diagnosis that may or may not be well supported. This can lead to the perpetuation of a diagnosis even if the evidence for it is unreliable.
Overconfidence bias ^{1,4}	The tendency to believe that one knows more than one does, which can lead to confidence in a diagnosis that is unsupported by the clinical data in a particular case.
Sutton's slip ¹	The tendency to evaluate an obvious problem and address it immediately without a thorough examination for other helpful information or additional possible diagnoses. This is named after the bank robber Willie Sutton.
Satisfaction of search ^{1,5}	The tendency to end a search after it has led to a clinical finding, despite the lack of a thorough examination of the facts in a particular case or instance. This can take the form of physically concluding a search or paying less attention to all of the possibly relevant findings in an examination after something significant has been identified.
Yin-Yang out bias ^{1,4}	The feeling that one is unlikely to make a diagnosis on a patient with a complaint that has already led to an extensive workup.
Zebra retreat ¹	The hesitation with which one considers a rare diagnosis (zebra) even though it may be the most likely diagnosis.

ANCHORING BIAS AND DIAGNOSIS MOMENTUM

Anchoring bias: Prematurely settling on a diagnosis based on a few important features of the initial presentation and failing to adjust as new information becomes available.


Diagnosis momentum: *Similar to anchoring.* Once a diagnostic label has been assigned to a patient by another individual, it is very hard to remove that diagnosis and interpret their findings with 'fresh eyes'.

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AGGREGATE BIAS

The belief that aggregate data, such as the data involved in the validation of clinical decision instruments, does not apply to the patient in front of you.


Example: Ordering of ankle xray and ignoring Ottawa Ankle Rules.

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CONFIRMATION BIAS

Once you have formed an opinion, you have a tendency to only notice the evidence that supports you and ignore contrary evidence.

Example: A patient might present with throbbing unilateral headache and photophobia; patient notes family history of migraines; you unconsciously discount the fact that patient gave history of acute, thunderclap onset.

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WHEN FAMILIAR LABELS ARE APPLIED,
SUPPORTING EVIDENCE BECOMES FAR
MORE VISIBLE THAN COUNTER-EVIDENCE ”
IN A PSYCHOLOGICAL PROCESS KNOWN
AS **CONFIRMATION BIAS.**

-Christopher Ryan

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OVERCONFIDENCE BIAS

Overestimation in one's own ability to know more than they actually do, also known as the *Dunning–Kruger Effect*, placing more emphasis on judgement rather than objective markers.

Example: You diagnose a patient presenting with left sided pleuritic chest pain after blunt trauma as having soft tissue injury as they have a normal respiratory examination rather than making a provisional diagnosis of pneumothorax and sending the patient for chest X-ray.

Mr. K, age 55, black male

Booked July 14, after clearance in ER with d/c
diagnosis of Asthma; wt 200 lbs


Charges: Attempted murder

Died in custody Aug 31, wt 164 lbs

Previous bookings: unknown

(What biases affected the decisions in his care?)

FACTORS AFFECTING OUR THINKING

1. Cognitive overload
 2. Interruptions or distractions
 3. Sleep deprivation
 4. Fatigue
 5. Emotional perturbations
- 
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HOW CAN WE, AS CLINICIANS, BEGIN TO
OVERCOME BIAS IN OUR DECISION-
MAKING?




FACTORS AFFECTING OUR THINKING

1. Cognitive overload
2. Interruptions or distractions
3. Sleep deprivation
4. Fatigue
5. Emotional perturbations

How can we minimize these factors?



Some Strategies for overcoming bias

1. Pay attention to your inner voice; take an extra moment to consider other options when faced with a difficult diagnosis or when the outcome of a decision is critical.
 2. Avoid making important clinical decisions when tired, hungry, or angry.
 3. Engage others prior to making a diagnosis for their thoughts on the case.
 4. Consider your first impression as possibly wrong and what evidence suggests other diagnoses.
 5. Reflect on the past and when you had a similar patient.
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“ BEING DEEPLY KNOWLEDGEABLE ON ONE SUBJECT
NARROWS ONE'S FOCUS AND INCREASES
CONFIDENCE, BUT IT ALSO BLURS DISSENTING
VIEWS UNTIL THEY ARE NO LONGER VISIBLE,
THEREBY TRANSFORMING DATA COLLECTION INTO
BIAS CONFIRMATION AND MORPHING SELF-
DECEPTION INTO SELF-ASSURANCE. ”

- Michael Shermer

THANK YOU.

Questions?