

COGNITIVE BIAS IN MEDICINE

MGR. BARBORA KÓŠA

DEPARTMENT OF PSYCHOLOGY AND PSYCHOSOMATICS

FACULTY OF MEDICINE

MASARYK UNIVERSITY

Begin early to make a threefold category—clear cases, doubtful cases, mistakes. And learn to play the game fair, no self-deception, no shrinking from the truth; mercy and consideration for the other man, but none for yourself, upon whom you have to keep an incessant watch.

-Sir William Osler MD

Osler W. The student life. A farewell address to Canadian and American medical students. *The Medical News* 1905(September 30);87(14):625–633.

Let's begin with a case.

Case

- **Chief Complaint:** “Get away from me”
- **History of Present Illness:** 18 year old Hispanic male presented by his Sergeant (SGT) for bizarre behavior. According to the SGT, the patient has been a mediocre soldier since the first day of boot camp and a “slacker who can’t hack it.”
- He has been acting strangely for 2 days and making a lot of sexual comments.
- According to one trainee, “he’s been looking for attention to get kicked out” and has “refused to train”. They feel 2 days ago he tried to hit his head while getting out of a 5 ton truck to try to avoid training.

Case Continued

- **Exam:** Vital signs are normal
- **Neuro:** Non-focal
- **Mental Status Examination:** “Beautiful” mood, sexual comments, later found by staff masturbating in the evaluation room
- **Skin:** Small hematoma on right anterior scalp region

- **Labs:**
- Complete blood count, complete metabolic panel, thyroid stimulating hormone, toxicology screen, urine drug screen are within normal limits

Case: Questions to think about

- How do I as a physician diagnostically and clinically approach this case?
- What are two significant thinking biases at risk in this particular case?
- How would I prevent myself from making cognitive/thought errors in order to reach an accurate diagnosis?

MAIN AIMS

- Recognize and describe thinking (cognitive) biases that may lead to diagnostic errors
- Recall typical cognitive steps involved in diagnostic reasoning

Quick Question

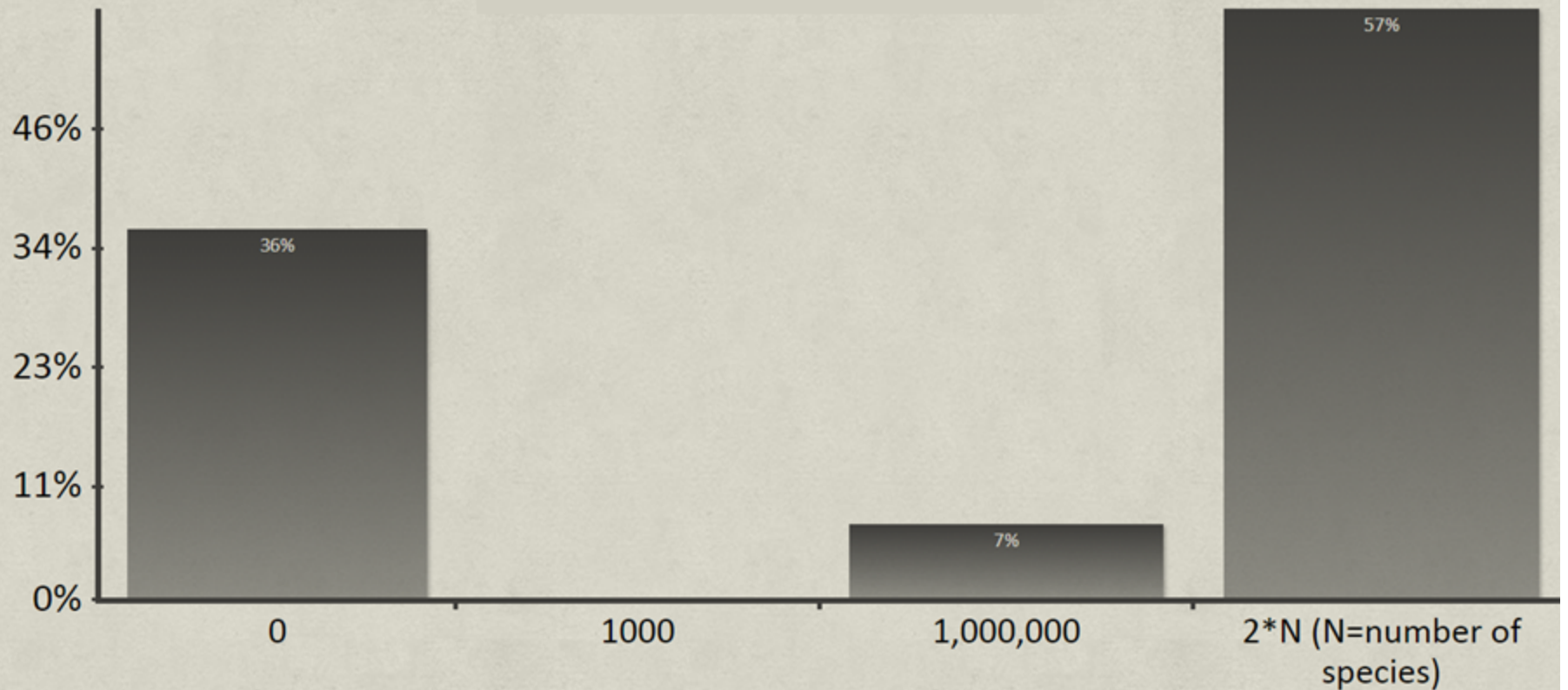
- On the next slide, you will be asked to answer one question.
- Answer it quickly and do not overthink it.
- Answer on your own without eliciting or giving help to your peers.
- NOTE: If you are pulling out a calculator, you are overthinking it!

Test Your Religious Knowledge

- How many animals did Moses place in the arc?
 - A: 0
 - B: 100,000
 - C: unable to determine
 - D: $N(2)$ (where N = number of species)

American Psychiatric Association Annual Meeting 2014 results, N=14

How many animals did Moses place in the arc?



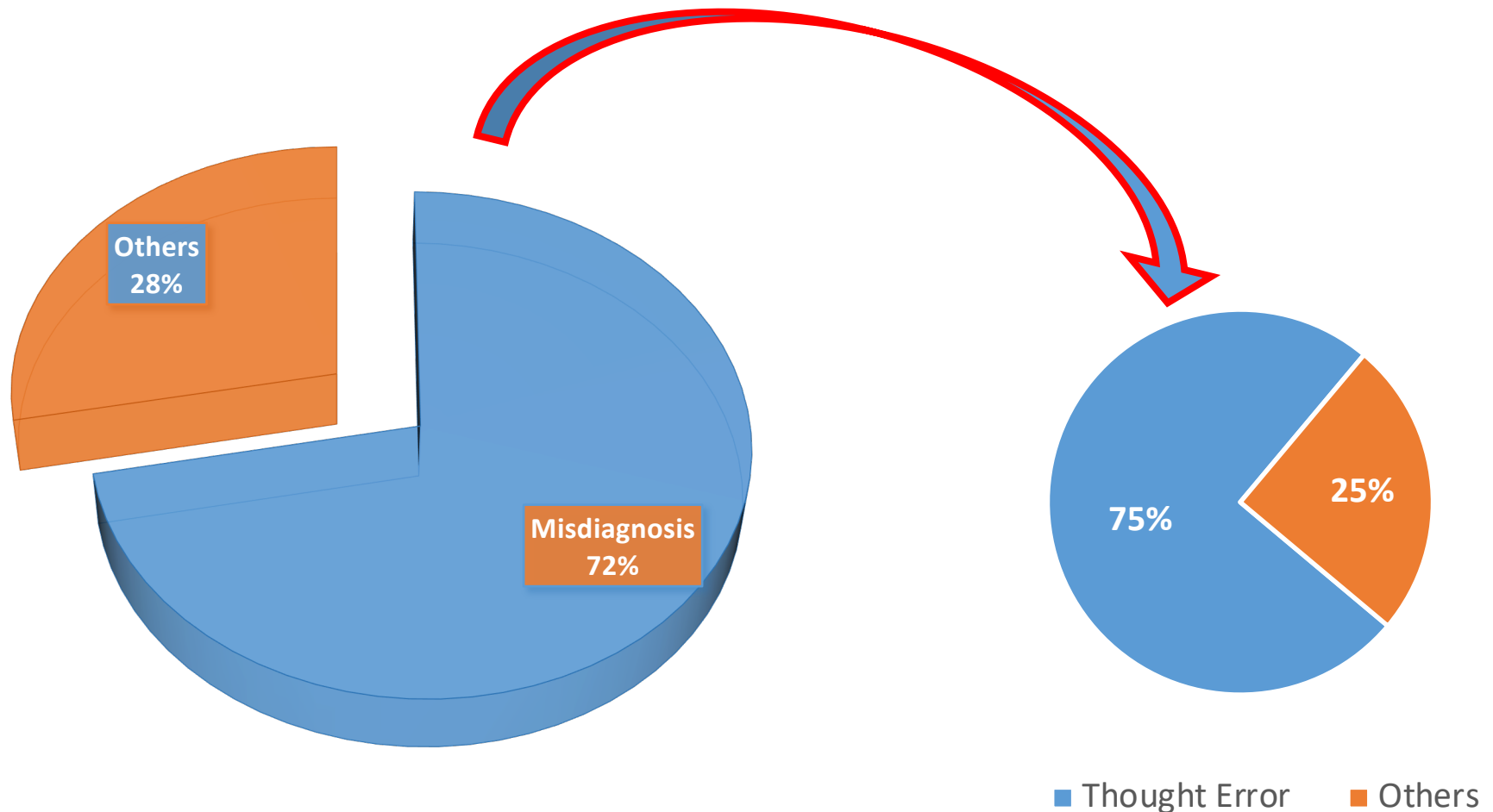
Why Should I Care?

- IMPROVED DIAGNOSTIC CLARITY
 - Primary Care: Depression identified in only 47.3% of cases
- DECREASED MORTALITY/MORBIDITY
 - 44,000 – 98,000 deaths per year
 - 5.07% of psychiatric patients experience a medication error.

Arch Intern Med. 2005;165(13):1493-1499

JAMA Intern Med. 2013 Dec 9-23;173(22):2063-8

MISDIAGNOSIS: Most Common Reason for Lawsuits



Arch Intern Med. 2005;165(13):1493-1499

JAMA Intern Med. 2013 Dec 9-23;173(22):2063-8

Other types of error

- **Diagnostic**

Error or delay in diagnosis; failure to employ indicated tests; use of outmoded tests or therapy; failure to act on results of monitoring or testing

- **Treatment**

Error in the performance of an operation, procedure, or test; error in administering the treatment; error in the dose or method of using a drug; avoidable delay in treatment or in responding to an abnormal test; inappropriate (not indicated) care

- **Preventive**

Failure to provide prophylactic treatment; inadequate monitoring or followup of treatment

- **Other**

Failure of communication; equipment failure; other system failure

HOW WE AS CLINICIANS THINK...

Clinical Decision Making Process

Definitions:

Illness Scripts: Physician's image of diseases/ presentations that are used to match problem representations.

Problem Representation (Summary): Physician's restatement of the patient specific problem list.

Clinical Decision Making Process

1. Clinical Assessment: The patient presents with a set of signs, symptoms, and clinical information that the physician assesses.
2. Problem List: The physician creates a list of problems for the patient presentation.
3. Problem Representation: The physician summarizes the clinical presentation as a problem representation (clinical summary)

Clinical Decision Making Process

4. Illness Scripts: The physician utilizes their repertoire of illness scripts (all past clinical experience and knowledge) and compares that mentally against the current problem presentation.
5. Differential Diagnosis: The physician generates a differential diagnosis for the problem presentation.
6. Diagnosis: The physician then selects a particular diagnosis if able, or obtains further diagnostic testing to rule something in or out.

Problem representation

- <https://www.youtube.com/watch?v=8YhoREXzKLc>

Let's apply these 6 steps to our earlier case...

- What is my problem representation in this case?
- What are two significant cognitive biases at risk in this particular case?
- How would I prevent myself from making cognitive/thought errors in order to reach an accurate diagnosis?

Case

- **CC:** “get away from me”
- **HPI:** 18 yo Hispanic male presented by his Sergeant (SGT) for bizarre behavior. According to the SGT, the patient has been a mediocre soldier since the first day of boot camp and a “slacker who can’t hack it.”
- He has been acting strangely for 2 days.
- According to one trainee, “he’s been looking for attention to get kicked out” and has “refused to train”. They feel 2 days ago he tried to hit his head while getting out of 5 ton truck to try to get out of training where he now has a bruise.
- He has also been making a lot of sexual comments.

Case Continued

- **Exam:** Vital signs are normal
- **Neuro:** non-focal
- **MSE:** “beautiful” mood, sexual comments, later found by staff masturbating in the evaluation room
- **Skin:** small hematoma on right anterior scalp region

- **Labs:**
- Complete blood count, complete metabolic panel, urinalysis, thyroid stimulating hormone, toxicology screen, urine drug screen are within normal limits

Clinical Decision Making Process

1. Clinical Assessment: History, Physical, Additional Diagnostic Tests

2. Problem List: The physician creates a list of problems for the patient presentation.

3. Problem Representation: The physician summarizes the clinical presentation as a problem representation (clinical summary)


1. History, Physical, Additional Diagnostic Tests

2. *(Subjective)* Bizarre behavior, subpar performance, head injury, strange; *(Objective)* hypersexual, disinhibited, scalp hematoma

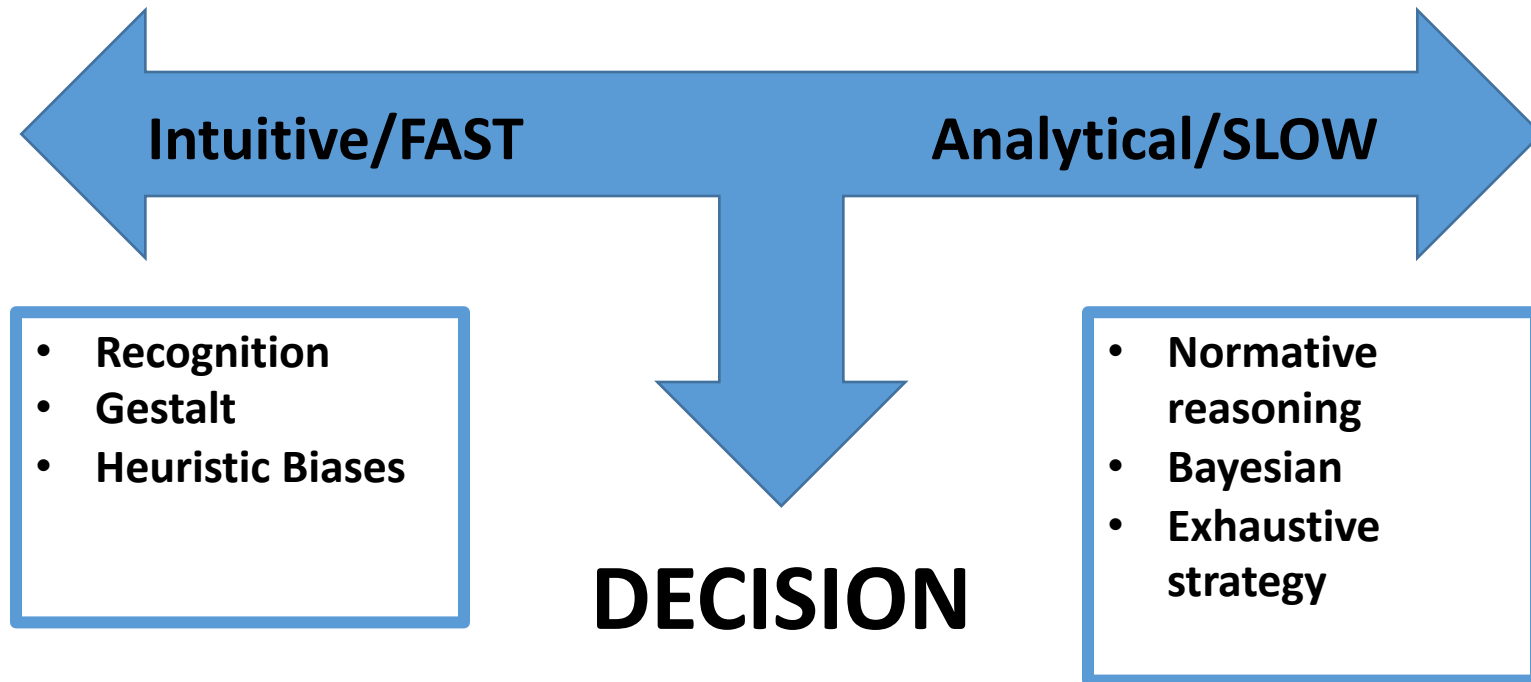
3. 18 year old Hispanic male Soldier with 2 days of disinhibition, hyper sexuality following mild head trauma.

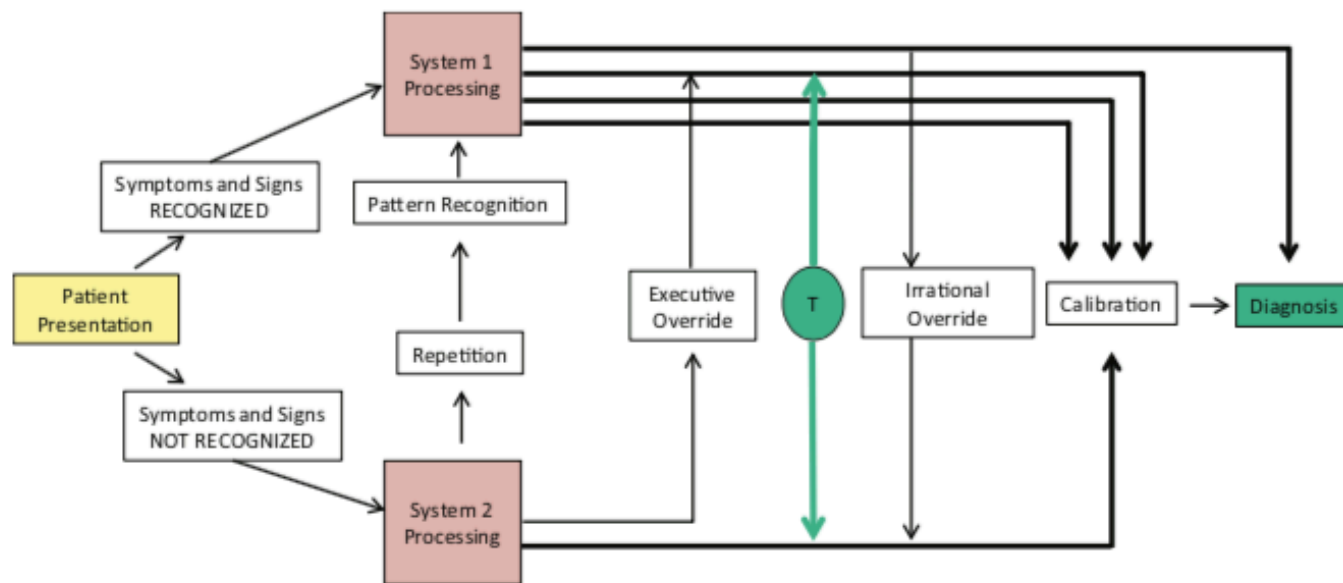
Clinical Decision Making Process

1. History, Physical, Additional Diagnostic Tests
2. *(Subjective)* bizarre behavior, subpar performance, head injury, strange; *(Objective)* hypersexual, disinhibited, scalp hematoma
3. 18 year old Hispanic male Soldier with 2 days of disinhibition, hypersexuality following mild head trauma.

4. Illness Scripts: What would explain disinhibition and hypersexuality following mild head trauma?
 5. Differential Diagnosis: Trauma, Seizure, Malingering
 6. Diagnosis: Needs head imaging to rule out trauma/bleed
- 

Dual Process Theory





Factors influencing which system is employed

- Task complexity
 - S1 – typical signs and symptoms
 - S2 – atypical symptoms, complex cases
- Expertise
 - S2 – novices, students
- accuracy of systems 2 thinking depends on knowledge base, expertise..

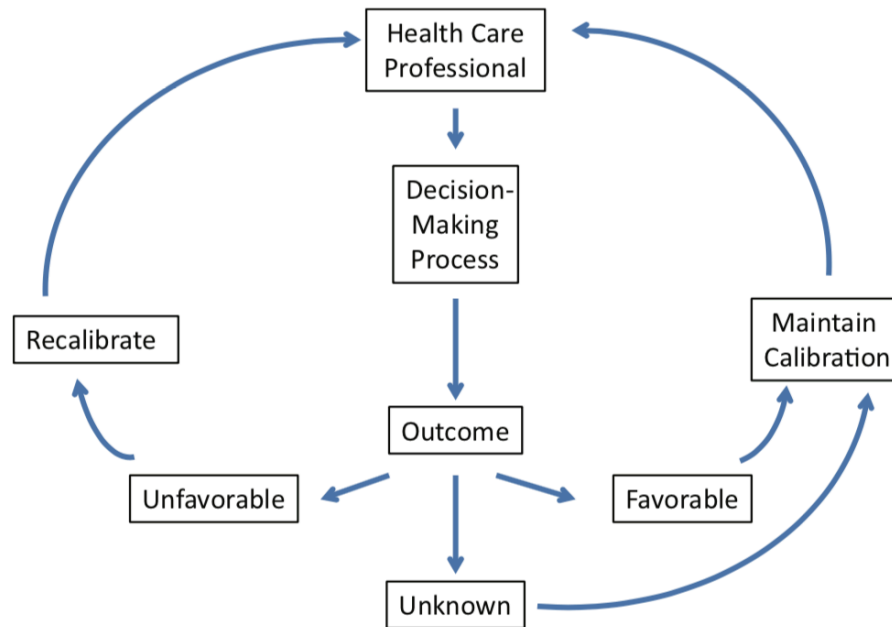


FIGURE 2-3 Calibration in the diagnostic process. Favorable or unfavorable information about a clinician’s diagnostic performance provides good feedback and improves clinician calibration. When a patient’s diagnostic outcome is unknown, it will be treated as favorable and lead to poor calibration.

SOURCE: Adapted with permission from The feedback sanction. P. Croskerry. *Academic Emergency Medicine* 7(11):1232–1238, 2000.

The diagnostic evidence base and clinical practice

- 13 000 conditions in *International Classification of Diseases, 9th Edition* (2015)
- primary care physicians 627.5 h/month of reading to keep up to date (Alper et al., 2004)

-> acknowledge clinical teams, follow systematic reviews and clinical practice guidelines

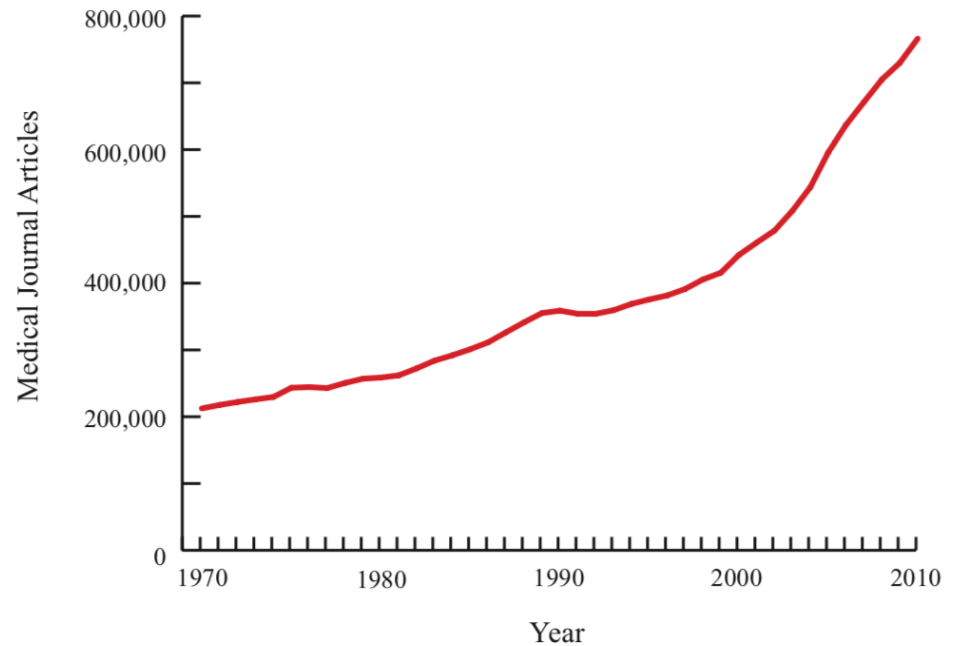


FIGURE 2-4 Number of journal articles published on health care topics per year from 1970 to 2010. Publications have increased steadily over 40 years.
SOURCE: IOM, 2013a.

More Definitions:

Heuristics:

- Cognitive shortcuts that permit clinicians to use a “FAST” thinking approach via the use of pattern recognition.
 - For example, seeing a patient with grandiose delusions and pressured speech leading to a rapid differential with the most-likely diagnosis being bipolar disorder.
- Advantage
 - Reduce time and effort to make reasonably good judgments and decisions.
- Disadvantage:
 - Potential to lead to systematic cognitive errors called biases.

Cognitive Biases

- Use of Heuristics, with its intent on speed, can lead to biased reasoning and misdiagnosis
- Numerous patterns of erroneous thinking have been identified and are now labeled
- Next several slides show common cognitive biases

- IMAGINE a basketball player

- IMAGINE a math competition winner

- IMAGINE a person diagnosed with anorexia

- IMAGINE a heart attack

Representativeness bias

- Only saying these words can create an image of prototypical patient based on a clinician's experience and the textbook descriptions of these cases.
- Clinicians spend large amounts of time on data collection to make precise diagnoses possible. In most cases, lung cancer patient is going to be an older smoker.
- Beware of exceptions to stereotypical descriptions. Some lung cancer patients are going to be young who never smoked before.

Representativeness bias

- *“how likely is it that this patient has a particular disease?”* by assessing how typical the patient’s symptoms are for that disease
- tendency to make decisions based on a **typical case**, „textbook disease example“
- highly typical symptoms (e.g., fever and nausea after contact with an individual from West Africa with Ebola virus), then it is likely the patient will be diagnosed as having that condition (e.g., Ebola virus infection).

Representativeness bias

- errors can also occur when there is an over-reliance on a patient's demographic factors or behaviors, as opposed to their clinical presentation.
- atypical presentations are not protected from the disease!

Representativeness bias study

- The potential of stereotypes to mislead clinicians was demonstrated in a study by Triplet. Subjects were provided with a patient with **vague symptoms**, such as fatigue and recurrent infections.
- Participants were given descriptions of five diseases: influenza, leukemia, AIDS, meningitis, and appendicitis, which were chosen in part because their symptoms often overlap.
- determine the most likely diagnosis.
- When told that a female patient was a **homosexual**, subjects rated her as being more likely to have AIDS than a **heterosexual woman** with identical symptoms.
- Although lesbians are in fact less likely to contract AIDS than heterosexual women, because they were broadly categorized in the higher risk group of "*homosexuals*," they were inappropriately judged to be at higher risk than heterosexual women

Imagine you examine a patient with symptoms of **mild depression**. In the last 3 months he was observing changes in his sleeping patterns, his negative thoughts are more frequent and persistent, he describes himself as being anxious, irritable and has lost his appetite.

No major life changes or stressors preceded this health condition.

After careful consideration, you are assured, that no contraindication regarding medication are present.

Half of students (those of you closer to the window)

CLOSE YOUR EYES

Is the probability estimate for markedly remission from depressive symptoms lower or higher than 25%?

Please write down your probability estimate of remission from depressive symptoms as a result of treatment with this medication.

OPEN YOUR EYES

Second half of students (those of you closer to the door)

CLOSE YOUR EYES

Is the probability estimate for markedly remission from depressive symptoms lower or higher than 75%?

Please write down your probability estimate of remission from depressive symptoms as a result of treatment with this medication.

OPEN YOUR EYES

WHAT NUMBERS DID YOU WRITE?

Anchoring bias

- Initial number created an anchor, starting point for your reasoning
 - all future negotiations, arguments, estimates, etc. are discussed in relation to the anchor
- When we decide, sometimes we rely on first information we encounter
- Our reasoning can be affected by very unlikely values or data

In an experiment by Strack and Mussweiler (1999), respondents were asked whether Mahatma Gandhi died before or after age 9, or before or after age 140 (groups guessed average age of 50 vs. average age of 67)
- Example: You see a T-shirt for 1200 USD, then you see one for 100 USD → you're prone to see the second shirt as cheap. Whereas, if you'd merely seen the second shirt, priced at \$100, you'd probably not view it as cheap
- Often used in negotiations

Anchoring Bias in medicine

- Focus on features in the patient's initial presentation too early in the diagnostic process without adjusting the outcome when further information are available.

A patient is admitted from the emergency department with a diagnosis of heart failure. The hospitalists who are taking care of the patient do not pay adequate attention to new findings that suggest another diagnosis.

~ **Premature closure, Confirmation bias**

Acad. Med. 2003;78:775–780.

Acad Med. 2011 Mar;86(3):307-13.

Framing bias

- Would you rather choose MEDICATION A with „cure rate 95%“ or MEDICATION B with „failure rate“ 2,5 %?
- **Loss aversion** - losses and gains are perceived differently and people make choices based more on perceived gains than perceived losses. If a person has to choose between two equal options, they are more likely to choose the one that is framed as a gain over one that is framed as a loss
- Beware of how information about treatment is presented !

Framing bias example

To see how framing might affect a clinician's judgment, imagine you are in the middle of an epidemic and have to choose one of two treatment options

In the following scenario, choose A or B:

- A. 80% chance to save 1,000 people, 20% chance to save 0.
- B. Save 700 for sure.

This choice is a high chance of significant gains. Most people **will favor a risk adverse strategy** and choose B, even though the expected value of A is higher.

In the following scenario, choose A or B:

- A. 80% chance to kill 1,000 people, 20% chance to kill 0.
- B. Kill 700 for sure.

This is framed in terms high risk of significant loss. Most people will **favor a risk seeking strategy and choose A**, even though the expected value of B is higher.

Emotional Bias

- Negative or positive feelings towards patient influences diagnosis (counter-transference)
 - Obese patients, non-adherent patients, chronic pain, “borderline”
 - Famous patients, important patients, attractive patients
- **outcome bias** – physician favors tests/treatments which won’t mean significant consequences for patient
 - Tendency to opt for treatments with previous positive outcomes, rather than the evidence supporting the treatment at the time of diagnosis

Acad. Med. 2003;78:775–780.

Acad Med. 2011 Mar;86(3):307-13.

Availability Bias

- Recall of diagnostic or other information because it happens to be a recent experiences
- Can be induced by media exposure, previous case...
- For example: A day after confirming diagnosis of temporal lobe seizures causing auditory hallucinations, your next patient is thoroughly reviewed by your for temporal lobe seizures because it's a “fresh” and “available” entity in your mind.

Acad. Med. 2003;78:775–780.

Acad Med. 2011 Mar;86(3):307-13.

Unpacking Bias

- Failure to elicit all pertinent information to make diagnosis.

Example: failing to obtain collateral of Spice abuse resulting in misdiagnosis of primary psychosis.

Acad. Med. 2003;78:775–780.

Acad Med. 2011 Mar;86(3):307-13.

Diagnosis Momentum

- Once diagnostic labels are attached to patients, they tend to become stickier and stickier. What might have started as a possibility gathers increasing momentum until it becomes definite, and all other possibilities are excluded.

Example: DEEEFFFINTELY A BORDERLINE!!

Acad. Med. 2003;78:775–780.

Acad Med. 2011 Mar;86(3):307-13.

Confirmation Bias

- Notice and consider only those signs and symptoms that favor our hypothesis and ignore aspects inconsistent with it.

Acad. Med. 2003;78:775–780.

Acad Med. 2011 Mar;86(3):307-13.

Base rate neglect

- This occurs in medicine when the underlying incident rates of conditions, or population based knowledge are ignored as if they do not apply to the patient in question.

Psychologists are looking for *trauma* and *dissociation*, because these are „exotic“, but often don't realize its prevalence in population

Overconfidence bias

- Universal tendency to believe that we know more than we do.
 - This bias encourages individuals to diagnose a disease based on incomplete information; too much faith is placed in one's opinion rather than on carefully gathering evidence. This bias is especially likely to develop if clinicians do not have feedback on their diagnostic performance.

Blind Obedience

- Showing undue deference to authority or technology
 - “Neurological etiologies ruled-out by the neurology consultant.”
 - “The ED has medically cleared the patient.”

Cognitive Errors and Diagnostic Mistakes

A Case-Based Guide to
Critical Thinking in Medicine

Jonathan Howard

 Springer

“Entertaining, illuminating and – when you recognize yourself
in the stories it tells – mortifying.” – *Wall Street Journal*

MISTAKES WERE MADE

(but not by *me*)

**WHY WE JUSTIFY FOOLISH BELIEFS,
BAD DECISIONS, AND HURTFUL ACTS**

Carol Tavris *and* Elliot Aronson

THE NEW YORK TIMES BESTSELLER

THINKING,
FAST AND SLOW



DANIEL
KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

"[A] masterpiece . . . This is one of the greatest and most engaging collections of insights into the human mind I have read." —WILLIAM EASTERLY, *Financial Times*

Back to the Case...

- What is my problem representation in this case?
- What are two significant cognitive biases at risk in this particular case?
- How would I prevent myself from making cognitive/thought errors in order to reach an accurate diagnosis?

Example of Cognitive Biases from the Case

- **Emotional (also known as visceral) bias:**

- Everyone is pointing at the Soldier to be a “slacker” and a “failure”. You feel like “this guy is trying to manipulate me to get out of the Army.” It makes you dislike the patient and “know for sure” he’s just a malingerer.
- Alternatively, you “hate to see kids getting bullied.” You promise yourself that “I have to advocate for this guy and protect him from the Army.” You end up missing malingering and expose the soldier to unwanted additional testing.
 - NOTE: emotional biases can be negative or positive. It’s a problem when that undesirable dislike or over-identification with the patient leads to erroneous reasoning.

- **Blind obedience:**

- The Emergency Room physician calls you and tells you that “I’ve got a good one for you.” You are told the patient is medically cleared and needs to be hospitalized. You take this information at face value. Subsequent head imaging shows patient had a head bleed.
- The high ranking Sergeant for the Soldier tells you “exactly what’s going on with the Soldier. He’s just been a pain since Day 1 and is just malingering.” You again decide to go with the Sergeant’s word and miss a head bleed.

So What Do We Do About It?

Cognitive Forcing Strategies

- Activate known cardinal rules or caveats
- Look back at problem representation
- Deciding when to switch from “Fast” thinking to “Slow” thinking analytical mode
- Decreasing the processing ease of an argument reduced confirmation bias effects (graphical inconsistency of information – mind maps, fonts..)

Disfluency

- Confirmation bias is reduced when information is presented in a disfluent format
 - Less confirmation bias when evaluating capital punishment arguments
 - Jurors give less confirmatory verdicts after reading a disfluent summary of a crime (written in italics...)
 - Confirmation biases were observed more often under cognitive load (**time pressure**)

(Hernandez, Preston, 2013)

Metacognition

- Monitoring decision making - deliberative examination of one's own reasoning
- Expert practice requires reflection for growth
- **Routine expert** (appropriately uses preexisting knowledge to quickly solve routine, familiar or uncomplicated problems) / **adaptive expert** (able to employ a deep conceptual understanding and engage in reflection to create novel solutions for complicated or unfamiliar problems...)
- Healthy **scepticism** about own thought processes

(Royce et al., 2019)

Techniques for metacognition

- **Create alternative hypothesis** „*What else could this be?*“
- **Consider-the-opposite** – create argument list, why your primary diagnosis might not be correct -> lowers hindsight bias, overconfidence, anchoring (Mussweiler, 2000)
- **Estimate your own accuracy with given diagnosis** – lowers overconfidence bias
- **Diagnostic time-out** (explicit pause to reflect on the thinking process leading to the diagnosis) especially at patient handoff / when confronted with complex case
- Keep a journal/patient log for further learning or self-reflection

Checklists and related tools

- SPECIFIC: Diagnostic accuracy can be improved by using checklists with typical „**not-to-miss**“ symptoms or diagnoses / GENERAL: “Again try to reevaluate your decision.”
- Specific checklists with symptoms were shown to be more effective
- Catheter infections were significantly reduced in Michigan Keystone ICU project (2006) with implementation of 5 steps checklist (*wash your hands, old catheter disposal...*)
- Only 8% of physicians were willing to use checklists...(Saposnik et al., 2016)
- **Perspective change** : prospective hindsight, **think like an outsider**

Get help from other people/use decision tools

- Reach out for help - ask for **feedback** and enhance communication with multidisciplinary team
 - Get **second opinions**
 - *get intensive, detailed, specific* feedback
 - Learn from errors
 - Use specialist consultants & second opinions; improve team-based decisions, for example, by having a devil's advocate
 - routine meetings, supervision, mentoring

Reduce reliance on memory

- Use of guidelines, clinical algorithms, linear models and mnemonics
- Improve medical records
- Improve data display through graphics
- Use decision support tools

Acknowledge your limits...

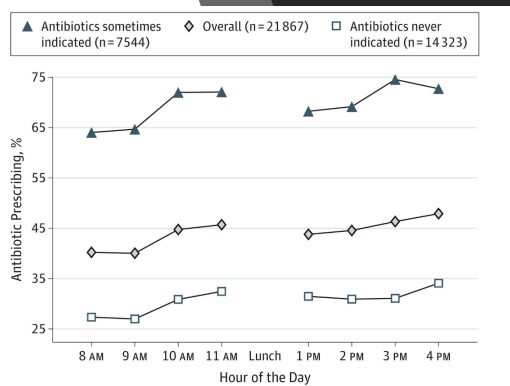


Figure. Antibiotic Prescribing by Hour of the Day

Diagnoses for which antibiotics are sometimes indicated were otitis media, sinusitis, pneumonia, and streptococcal pharyngitis. Diagnoses for which antibiotics are never indicated were acute bronchitis, nonspecific upper respiratory infection, influenza, and nonstreptococcal pharyngitis. Linear trend in session hours (combining 8 AM with 1 PM, 9 AM with 2 PM, 10 AM with 3 PM, and 11 AM with 4 PM): $P < .001$ for antibiotics sometimes indicated; $P < .001$ for all acute respiratory infection visits; and $P < .002$ for antibiotics never indicated. During clinic sessions, the proportion of acute respiratory infection visits for which antibiotics were sometimes indicated did not vary significantly from hour to hour ($P = .64$).

- **Decision fatigue** - worsened ability to decide and overcome easy solutions as a result of multiple previous decisions
- decision fatigue and antibiotic prescription
- N= 204 physicians
- Odds ratio of antibiotic prescription raised with hours spent in service (the chance of prescribing antibiotics was highest before lunch – “easy choice”)
- REMEDIES
- Support tools for decision making according time of the day
- Regular breaks and snacks

(Linder et al., 2014)

- Create solid knowledge base
- Search for objective data
- Understand statistical prediction rules
- Rule-out the worst-case scenario

Practical Steps

1. Take a step back: Think about thinking.

- Am I confident in the diagnosis?

- If yes, question yourself

- Thorough Self Appraisal of Perspective, Previous Mistakes, Diagnostic Ambiguity, and Evaluation of Potential Cognitive Bias

- If no, go to step 2

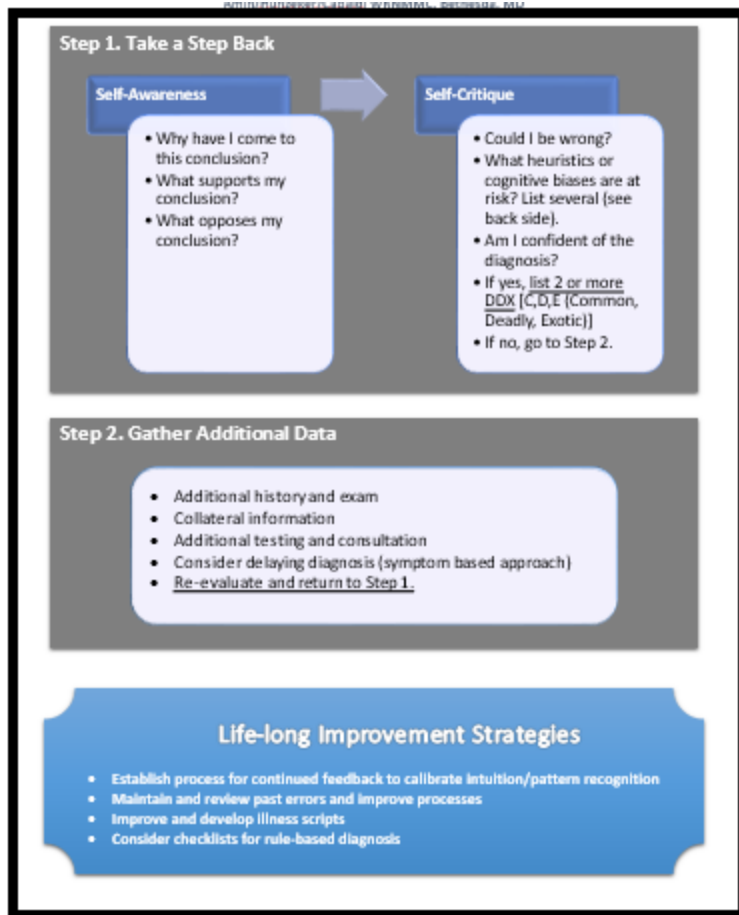
Practical Steps (continued)

2. Gather additional data.

- Additional history and exam
- Collateral information
- Additional testing and consultation
- Consider delaying diagnosis (symptom based approach)

3. Re-evaluate and return to Step 1.

Diagnostic Card



Cognitive Bias	Definition
Anchoring Bias (Premature Closure)	Focus on features in the patient's initial presentation too early in the diagnostic process without adjusting the outcome when further information is available.
Emotional Bias (Ψ)	Negative or positive feelings towards patient influences diagnosis (counter-transference). Examples: Obese patients, non-adherent patients, chronic pain, "borderline"
Availability Bias	Evaluating something as more probable just because you know it and it readily comes to mind
Confirmation Bias	Tendencies to look for confirming evidence that supports your diagnosis and ignoring refuting evidence.
Diagnostic Momentum (Ψ)	Failure to consider diagnostic evaluation due to prior diagnostic "labels" attached.
Blind Obedience (Ψ)	Showing undue deference to authority or technology. Example: ED has "medically cleared" the patient. Not considering false positive or false negative rates of a test.
Unpacking (Ψ)	Failure to elicit all pertinent information to make diagnosis. Example: failing to obtain collateral of Spice abuse resulting in misdiagnosis of Psychosis NEC.
Framing Effect	The source of the information and how it is framed influencing diagnosis based on <i>Problem Representation</i> .
Base rate neglect (Ψ)	The tendency to ignore true prevalence of a disease either inflating or reducing its baseline rate. Example: Resident worrying about "missing something" in someone with classic mania and pursuing seizure disorder as a cause.
Fundamental attribution error (Ψ)	Tendency to blame the patient for their symptoms. Example: Paranoid schizophrenia patient refusing to take his medication is taken as an act of defiance rather than a symptom of underlying disorder by the ED staff.
Ascertainment Bias (Ψ)	Tendency to have thinking shaped by prior expectations of the physician such as a stereotype, racial or gender bias. Example: ignoring chest pain on inpatient psychiatric ward in a patient with somatization disorder subsequently found to be a pulmonary embolism.

(Ψ)= Authors opine these are likely more prevalent in psychiatric practices.

Pair-Group Discussion

- One of you start with presenting the case on your sheet to your partner
- Partner receiving presentation will be asked questions at the end by the presenting partner
 - 10 minutes
- After the first case, we will take a break for large group discussion
 - 5 minutes
- Partners switch and repeat the above for the second case

Case 1 Distribution

- 10 minutes pair discussion
- 5 minutes large group discussion

Case 2 Distribution

- 10 minutes pair discussion
- 5 minutes large group discussion

Conclusions

- Thought errors are a leading cause of morbidity, mortality in medicine and entail medico-legal implications.
- Understanding how we think and make decisions highlight our tendencies to commit cognitive errors.
- Insight into our unique tendencies and biases may help reduce our diagnostic errors.
- Meta-cognition (thinking about our thinking) is the first step in helping us assess our confidence level when dealing with diagnostic data.
- Use of the provided checklist on the card and familiarity with common cognitive biases in your daily practice may help in your clinical maturation process.

How would you feel after making diagnostic mistake?

<https://www.youtube.com/watch?v=GxGe8HMbJOg>

EMOTIONAL CONSEQUENCES OF MISTAKES

- 80s' – personal stories of feeling inadequate, incompetent, guilty after medical error...
- doctor seen as a **second victim**
- PTSD-like symptoms after error (Wolf)
- Image of perfection in healthcare -> not prepared to confront error

Second victims are healthcare providers who are involved in an unanticipated adverse patient event, in a medical error and/or a patient related injury and become victimized in the sense that the provider is traumatized by the event. Frequently, these individuals feel personally responsible for the patient outcome. Many feel as though they have failed the patient, second guessing their clinical skills and knowledge base

- *“No matter how much you fool yourself you are over something, and maybe even though I hadn’t thought of it for months, I had that woman’s name seared into my memory and as soon as I saw that name, my chest was up in my throat. I still think about it. Just randomly you forget and then something will happen and it just pops into your head. You go over it again, what could I have done differently, what could I have said, what should I have done?”*
- *“I remember feeling horribly sad that I couldn’t do more for this child. This hit me harder than most of them. For some reason I really related with this family—I guess one reason is that the child was the age of my oldest daughter and I guess that I felt that this could have been my family. They were a nice family and didn’t deserve to have this outcome. I cried a lot over this case and I guess I still cry when I think about her. “*

How would you feel after taking part in medical error?

PHYSICAL SYMPTOMS

- Extreme fatigue
- Sleep disturbances
- Rapid heart rate
- Increased blood pressure
- Muscle tension
- Rapid breathing

• PSYCHOSOCIAL SYMPTOMS

- Frustration
- Decreased job satisfaction
- Anger
- Extreme sadness
- Difficulty concentrating
- Flashbacks
- Loss of confidence
- Grief
- Remorse
- Depression
- Repetitive/intrusive memories
- Self-doubt
- Return to work anxiety
- Second guessing career
- Fear of reputation damage
- Excessive excitability
- Avoidance of patient care area

Table 5 Research team consensus for trajectory of recovery

	Stage characteristics	Common questions
Stage 1 Chaos and accident response	Error realized/event recognized Tell someone → get help Stabilize/treat patient May not be able to continue care of patient Distracted	How did that happen? Why did that happen?
Stage 2 Intrusive reflections	Re-evaluate scenario Self isolate Haunted re-enactments of event Feelings of internal inadequacy	What did I miss? Could this have been prevented?
Stage 3 Restoring personal integrity	Acceptance among work/social structure Managing gossip/grapevine Fear is prevalent	What will others think? Will I ever be trusted again? How much trouble am I in? How come I can't concentrate?
Stage 4 enduring the inquisition	Realization of level of seriousness Reiterate case scenario Respond to multiple "why's" about the event Interact with many different "event" responders Understanding event disclosure to patient/family Physical and psychosocial symptoms	How do I document? What happens next? Who can I talk to? Will I lose my job/license? How much trouble am I in?
Stage 5 Obtaining emotional first aid	Seek personal/professional support Getting/receiving help/support Litigation concerns emerge	Why did I respond in this manner? What is wrong with me? Do I need help? Where can I turn for help?
Stage 6 Moving on (one of three trajectories chosen)	<u>Dropping out</u> Transfer to a different unit or facility Consider quitting Feelings of inadequacy <u>Surviving</u> Coping, but still have intrusive thoughts Persistent sadness, trying to learn from event <u>Thriving</u> Maintain life/work balance Gain insight/perspective Does not base practice/work on one event Advocates for patient safety initiatives	Is this the profession I should be in? Can I handle this kind of work? How could I have prevented this from happening? Why do I still feel so badly/guilty? What can I do to improve our patient safety? What can I learn from this? What can I do to make it better?

STAGES OF RECOVERY

- **CHAOS** *Right after the event and during the code, I was having trouble concentrating. It was nice to have people take over, that knew what they were doing, that I trusted. I was in so much shock. I don't think I was as useful as I usually am during a code situation.*
- **INTRUSIVE REFLECTIONS** *„I started to doubt myself. This shouldn't have happened. It was all hindsight but I kind of kept thinking over and over again. There were some things that I thought maybe if I'd have done it this way, it wouldn't have happened or been avoided. Everything was clearer looking at things in retrospect. I lost my confidence for some time.“*
- **SUPPORT SEEKING** *“Do they think of me everyday as this loser who doesn't know what is going on?”, I thought, “These people are never going to trust me again”.*
 - Depends on organisational culture, overlooking mistake or gossip frustrates
- **ENDURING THE INQUISITION** – *„What are the consequences going to be? How is it going to influence my career?“*
- **EMOTIONAL FIRST AID** *Nobody wanted to talk about it. I am not a touchy, feely person but I at least needed someone to make sure I was doing okay and I never felt like that. I felt like, “Well, this happens and you should be better about it and that's it.”*
- **MOVING ON** - dropping out, surviving or thriving

- medical error creates **cognitive dissonance**

COGNITIVE DISSONANCE

- Not a bias itself but leads to many biases
- mental discomfort (psychological stress/uncomfortable feeling) that we get when
 - Two beliefs (values/ideas) that we hold are inconsistent with each other
 - Our beliefs are inconsistent with our behaviour
- Triggered by a situation in which a person's belief clashes with new evidence perceived by the person
- Example
 - Treatment is not effective

This leads to

- Self-justification – mental gymnastics that allow us to maintain the view that we are competent and correct
- Confirmatory bias – we search for information that tells us we are right
- Blaming others...

REDUCTION OF COGNITIVE DISSONANCE

- motivation to lessen mental stress by actions that reduce the magnitude of the dissonance
 - **Change the behavior or the cognition** ("I'll eat no more of this doughnut.")
 - **Justify the behavior or the cognition**, by changing the conflicting cognition ("I'm allowed to cheat my diet every once in a while.")
 - **Justify the behavior** or the cognition by adding new behaviors or cognitions ("I'll spend thirty extra minutes at the gym to work off the doughnut.")
 - **Ignore or deny information that conflicts with existing beliefs** ("This doughnut is not a high-sugar food.")

Remedies for your own dissonance

- Recognise that reducing dissonance is a strong drive
 - Be aware of the distortions that arise from dissonance
 - Be vigilant for the feeling of discomfort due to dissonance and be vigilant about being open to new information
- Be open to the possibility of error
- Dissonance is human, be willing to experience it
- Prevent bad decision after bad decision in self-justification !

Klein (2019)

- especially for young doctors – perfectionism,
„good doctor does not make mistakes“...

WHAT ARE POSSIBLE CONSEQUENCES OF THAT STATEMENT?

‘A good doctor learns from mistakes. It’s not that a good doctor never makes mistakes.’

I have not been successful in dealing with a paradox: I am a healer, yet I sometimes do more harm than good. Obviously, we physicians must do everything we can to keep mistakes to a minimum. But if we are unable to deal openly with those that do occur, we will find neurotic ways to protect ourselves from the pain we feel. Little wonder that physicians are accused of playing God. Little wonder that we are defensive about our judgments, that we blame the patient or the previous physician when things go wrong, that we yell at nurses for their mistakes, that we have such high rates of alcoholism, drug addiction, and suicide. At some point we must all bring medical mistakes out of the closet. This will be difficult as long as both the profession and society continue to project their desires for perfection onto the doctor. Physicians need permission to admit errors. They need permission to share them with their patients. The practice of medicine is difficult enough without having to bear the yoke of perfection.

(Howard, 2019)

RECOMMENDED READING

- Croskerry, P. (2003). The importance of cognitive errors in diagnosis and strategies to minimize them. *Academic medicine*, 78(8), 775-780.
- Croskerry, P. (2002). Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Academic Emergency Medicine*, 9(11), 1184-1204.
- Howard, J. (2019). *Cognitive Errors and Diagnostic Mistakes*. Springer International Publishing.

- MORE ON CRITICAL THINKING

Neil Thompson & Jan Pascal (2012) Developing critically reflective practice, *Reflective Practice*, 13:2, 311-325, DOI: 10.1080/14623943.2012.657795