

Staying Out of Trouble: Guarding Against Cognitive Bias

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No conflicts of interest

Disclaimer



- Ambiguity Effect
- Anchoring or Focalism
- Anthropocentric Thinking
- Attention Bias
- Automation Bias
- Availability Heuristic
- Availability Cascade
- Backfire Effect
- Bandwagon Effect
- Base Rate Fallacy
- Belief Bias
- Ben Franklin Effect

Cognitive Biases



- Berkson's Paradox
- Bias Blind Spot
- Cheerleader Effect
- Choice-Supportive Bias
- Clustering Illusion
- Confirmation Bias
- Congruence Bias
- Conjunction Fallacy
- Conservatism (Belief Revision)
- Continued Influence Effect
- Contrast Effect
- Courtesy Bias

Cognitive Biases



- Curse of Knowledge
- Declinism
- Decoy Effect
- Denomination Effect
- Disposition Effect
- Distinction Bias
- Dunning-Kruger Effect
- Duration Neglect
- Empathy Gap
- Endowment Effect
- Exaggerated Expectation
- Experimenter's or Expectation Bias

Cognitive Biases



- Focusing Effect
- Forer Effect or Barnum Effect
- Framing Effect
- Frequency Illusion
- Functional Fixedness
- Gambler's Fallacy
- Hard-Easy Effect
- Hindsight Bias
- Hostile Attribution Bias
- Hot-Handed Fallacy
- Hyperbolic Discounting
- Identifiable Victim Effect

Cognitive Biases



- IKEA Effect
- Illusion of Control
- Illusion of Validity
- Illusory Correlation
- Illusory Truth Effect
- Impact Bias
- Information Bias
- Insensitivity to Sample Size
- Irrational Escalation
- Law of the Instrument
- Less-Is-Better Effect
- Look-Elsewhere Effect

Cognitive Biases



- Loss Aversion
- Mere Exposure Effect
- Money Illusion
- Moral Credential Effect
- Negativity Effect
- Neglect of Probability
- Normalcy Bias
- Not Invented Here
- Observer-Expectancy Effect
- Omission Bias
- Optimism Bias
- Ostrich Effect

Cognitive Biases



- Outcome Bias
- Overconfidence Effect
- Pareidolia
- Pessimism Bias
- Planning Fallacy
- Post-Purchase Rationalization
- Pro-Innovation Bias
- Projection Bias
- Pseudocertainty Effect
- Reactance
- Reactive Devaluation
- Recency Illusion

Cognitive Biases



- Regressive Bias
- Restraint Bias
- Rhyme As Reason Effect
- Risk Compensation / Peltzman Effect
- Selective Perception
- Semmelweis Reflex
- Sexual Overperception / Underperception Bias
- Social Comparison Bias
- Social Desirability Bias
- Status Quo Bias
- Stereotyping
- Subadditivity Effect

Cognitive Biases



- Subjective Validation
- Surrogation
- Survivorship Bias
- Time-Saving Bias
- Third-Person Effect
- Triviality/Parkinson's Law of
- Unit Bias
- Weber-Fechner Law
- Well Travelled Road Effect
- “Women Are Wonderful” Effect
- Zero-Risk Bias
- Zero-Sum Bias

Cognitive Biases



- OMG!!!
- Isn't it amazing that we survive at all?
- Or do we survive *because* of our biases (that allow us to get through each day)?
- But what about our **patients**?

A Lot of Work To Do!!!



How will **you** keep
your patients
safe???

A Lot of Work To Do!!!



- Reduction of biases in judgment and decision making through incentives, nudges, and training
 - Cognitive Bias Mitigation
 - Cognitive Bias Modification

DE-BIASING



- Stiegler MP, Neelankavil JP, Canales C, Dhillon A:
Cognitive errors detected in anaesthesiology: A literature review and pilot study. BJA 2012; 108(2):229-235.

Stiegler, et al.



- Deals with subject of cognitive errors and psychology of decision-making in anaesthesia
- Created anaesthesia-specific catalogue of cognitive errors using qualitative methodology
- Errors of key importance seen in >50% of simulated emergencies
- Provides deeper insight into error generation and potential prevention strategies

Key Points



- Cognitive errors = Thought-process errors (thinking mistakes) that lead to incorrect diagnoses, tx, or both
- Cognitive errors widely appreciated in other safety cultures (e.g. aviation) but little formal attention in anaesthesiology

Background



Two-part study

- First, cognitive error catalogue created specific to anaesthesiology practice through literature review, modified Delphi method c experts, survey of academic faculty
- Second, observation for cognitive errors during resident physician management of sim emergencies

Methods



- Of >30 cognitive errors, modified Delphi yielded 14 key items
- Survey responses narrowed to a ‘top ten’ catalogue

Results



- Anchoring
- Availability Bias
- Premature Closure
- Feedback Bias
- Framing Effect
- Confirmation Bias
- Omission Bias
- Commission Bias
- Overconfidence
- Sunk Costs

Top Ten



- Focusing on one issue at the expense of understanding the big picture
- *Example: troubleshooting an alarm on a pump and unaware of sudden surgical bleeding and hypotension*

1. Anchoring



- Choosing a dx in forefront of your mind due to an emotionally charged memory of a bad experience
- *Example: Dx a simple bronchospasm as anaphylaxis bc you had a case of anaphylaxis with a poor outcome*

2. Availability Bias



- Accepting a dx prematurely, while failing to consider reasonable differential dxs
- *Example: Missing a pneumo due to assuming the HOTTN in a trauma pt is a result of bleeding*

3. Premature Closure



- Misinterpretation of no feedback as ‘positive’ feedback
- *Example: Believing you never had a case of unintentional awareness since you have never received a complaint about such*

4. Feedback Bias



- Subsequent thinking swayed by leading aspects of initial presentation
- *Example: Your colleague tells you “this patient was extremely anxious preoperatively” and you attribute postop agitation to pt’s personality rather than low BS*

5. Framing Effect



- Seeking or acknowledging only information that confirms the desired or suspected dx
- *Example: Repeatedly cycling a NIBP cuff, or changing cuff sizes and locations, because you “do not believe” the low reading*

6. Confirmation Bias



- Hesitation to start emergency interventions for fear of being wrong or causing harm, tendency towards inaction
- *Example: Delay in calling for chest tube placement when suspecting a pneumo bc you may be wrong and will be responsible for that procedure*

7. Omission Bias



- Tendency toward action rather than inaction. Performing un-indicated interventions, deviating from protocol. Can be due to overconfidence, desperation, or pressure from others
- *Example: 'Better safe than sorry' insertion of additional unnecessary invasive monitors or access; potentially resulting in complications*

8. Commission Bias



- Inappropriate boldness, not recognizing the need for help, tendency to believe we are infallible
- *Example: Delay in calling for help when you have trouble intubating because you are certain you will eventually succeed*

9. Overconfidence



- Unwillingness to let go of a failing dx or decision, especially if much time/resources have already been allocated. Ego may play a role
- *Example: Having decided that a patient needs an awake fiberoptic intubation, refusing to consider alternative plans despite multiple unsuccessful attempts*

10. Sunk Costs



- Cognitive errors are thought to be a significant factor in medical mishaps
- *“Understanding the key types of cognitive errors specific to anaesthesiology is the first step towards training in metacognition and de-biasing strategies, which may improve patient safety.”*

Conclusions



- Stiegler MP, Tung A:
Cognitive processes in
anesthesiology decision
making. Anesthesiology
2014; 120:204-217.



CASE STUDY

Example: Factors at Work



- Park SP, Stojilkovic LS, Milicic B, Line B F, Dror IE: **Training induces cognitive bias: The case of a simulation-based emergency airway curriculum.** Society for Simulation in Healthcare 2014; 9(2):85-93.

Training-Induced Bias



- Simulation-based emergency airway curriculum
- Tested hypothesis that curriculum design can induce bias and affect decision making

Introduction



- 23 novice anesthesiology residents, randomized to 2 groups
- Primary outcome measure – initiation of SGA and cric techniques in sim CVCI scenario in 3 evaluation sessions
- Secondary outcome measure – response times for device initiation
- After baseline evaluation and didactic lecture, residents received initial practical training in either surgical cric (CRIC group) or supraglottic airway (SGA group). After midtest groups switched to receive alternate training

Methods



From baseline to midtest:

- SGA group increased initiation of SGA but not cricothyroidotomy
- CRIC group increased initiation of cricothyroidotomy but not SGA

Results



After completion of training (both techniques):

- SGA group increased initiation of both SGA and cricothyroidotomy
- CRIC group increased initiation of cricothyroidotomy but failed to change practice in SGA

Results



Final Test Response Times:

- CRIC group was slower to initiate supraglottic airway and faster to initiate cricothyroidotomy

Results



- Practical training in only 1 technique produced bias (both groups) despite preceding didactic lecture
- Chief finding: Asymmetrical effect of training sequence even after training in both techniques
- Initial training in cricothyroidotomy produced bias that did not correct despite subsequent SVG training.

Discussion



- “Educators must be alert to the risk of inducing cognitive bias when designing curricula.”

Conclusion



- We cannot escape human factors
- Must understand dangers of such
- De-bias your practice
- Guard against producing bias in trainees (...you are an educator too!)

Take Home Points



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Thank You...



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- Wikipedia. List of Cognitive Biases, retrieved from https://en.wikipedia.org/wiki/List_of_cognitive-biases on September 28, 2017.

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