Confirmation bias in medical decision-making

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Clinical reasoning has been suggested to occur in 2 stages: an initial advancing of diagnostic hypotheses followed by a slower stage where hypotheses are tested and eliminated or confirmed.[1] Confirmation bias is the tendency to give greater weight to data that support a preliminary diagnosis while failing to seek or dismissing contradictory evidence. This source of error is important in both research and everyday patient care. Examples include failure to entertain a new diagnosis in the face of an established diagnosis and dismissal of laboratory results as spurious when they fail to support the favored diagnosis.

Clinical simulation studies of cognitive errors among physicians in their first postgraduate year suggest that confirmation bias (bias toward existing beliefs) and anchoring bias (bias on the basis of initial data) are common causes of premature closure on an incorrect diagnosis.[2] Other key forms of cognitive bias in medical decision-making include availability bias (the tendency to think that diagnoses that come readily to mind are more likely), premature closure (falling in love with a diagnosis), response bias (inaccurate responses from participants), framing effect (semantics that favor a given response), omission bias (tendency to favor acts of omission over commission), overconfidence (subjective confidence in one's judgment out of proportion to data), and sunk cost bias (decision to stick with a concept because of all that has been invested in it).

Data suggest that confirmation bias is related to brain maturation and is a more powerful force and source of error in adults than in children or adolescents.[3] Although these data suggest we are hard wired for confirmation bias, techniques are available that can help us counterbalance our natural tendencies. One method is to attempt to disprove the favored diagnosis or at least perform balanced testing rather than strictly confirmatory testing. In a study of psychiatrists, participants conducting a confirmatory information search were more likely to make an incorrect diagnosis compared with those searching in a disconfirmatory or balanced way.[4] Other authors have shown that although reviewing a patient's clinical history can improve diagnostic accuracy, this practice also introduces confirmation bias.[5] Likewise, taking disease prevalence and patient characteristics into account can increase the odds of a correct diagnosis but might also introduce confirmation bias. To paraphrase a book that was popular when I was in medical school: When you hear hoofbeats, think of horses but don't forget to consider zebras… and always keep in mind that your favored diagnosis could be wrong.

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