The Idiom's Guide to Cognitive Bias in Diagnosis

	BIAS	DEFINITION	WHY IT HAPPENS	EXAMPLE	RELATED IDIOM	WHAT CAN HELP	COUNTER IDIOM
1	Affective Bias 	When emotions influence thinking, including positive or negative feelings towards a patient based on prior experiences.	Affective bias is influenced by psychological, social, cognitive, cultural, and biological factors. These factors drive our emotional responses to internal and external stimuli that in turn can skew our perception, attention, memory, decision-making and behaviour.	Finding a patient disagreeable and dismissing their shortness of breath as anxiety before considering a chest x-ray which would have revealed pleural effusions.	Leading with your heart and not your head	- Be aware of your unhelpful emotional reaction, and put it to the side - Identify the emotions you are prone to experiencing in particular scenarios - Channel an alternative emotion (e.g. compassion), to counteract your emotional response	Think before you act
2	Anchoring Bias 	Relying heavily on the first few features noted to support an initial diagnostic hypothesis and sticking with it despite new information that refutes this hypothesis.	Our brains commonly preference the first piece of information as a reference point for subsequent decisions and judgements, because it is perceived to be more salient, and this simplifies a complex process.	Attributing a patient's weight loss to the new diet and exercise routine they describe, without giving due consideration to their other recent symptoms of tremors, frequent bowel motions, and heat intolerance (that would suggest hyperthyroidism).	Digging your heels in	- Be thorough - Actively consider, rule in and rule out differentials - Ask about relevant negatives	Keep an open mind
3	Ascertainment Bias 	When decision-making is based on prior expectations (stereotyping, racial bias and gender bias are subsets of ascertainment bias).	We tend to categorise people into groups, and our expectations and inferences of those groups come from our experiences and everyday observations of the kinds of social roles they play.	Assuming that a patient found unconscious in the park next to an empty syringe has had an overdose, and missing the diagnosis of severe hypoglycaemia in a person with diabetes.	Judging a book by its cover	- Be mindful of stereotyping - Adopt an empathetic approach - Ask questions rather than make assumptions	Looks can be deceiving

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4	Authority Bias 	The tendency to assume that a more senior colleague is correct despite evidence to suggest otherwise.	Evolution and cultural norms program us to have respect for authority because strong hierarchical order can be beneficial to society. Trusting an expert generally saves us time and effort, however blind faith in an authoritative figure can impair the quality of a decision.	Reviewing a patient after surgery for drainage of a neck abscess and being concerned about their level of pain and difficulty breathing. Then accepting the surgeon's telephone advice that the symptoms are to be expected and missing the complication of an expanding haematoma.	Dancing to someone's else's tune	- Recognise that people can make mistakes despite decades of experience - Speak up if puzzled or concerned - Remember that good teams pool their knowledge and ideas	We're all cut from the same cloth
5	Availability Bias 	The tendency to think of diagnoses that come most easily to mind, usually because of recent, frequent, or vivid experiences.	The retrieval of facts or memories in our brain can occur spontaneously or through intentional effort. Events that occurred recently, or often, or that leave a lasting impression (perhaps because they are emotionally vivid) are more likely to be automatically recalled, so come to mind more easily.	Making a diagnosis of hay fever in a patient with cough and nasal congestion, on the basis that several patients have presented recently suffering hay fever with similar symptoms.	Front of mind	- Continue thinking beyond the initial diagnosis by generating alternatives - Consider if a recent experience is affecting your thinking - Recall the not-to-be missed diagnoses	Rack your brain
6	Base Rate Neglect 	The tendency to ignore statistical information about the base rate or true prevalence of a disease and give more weight to case-specific information (e.g. symptoms or test results).	We favour information that is specific to a person or event over objective, statistical data (the base rates) because our brains correlate specificity with relevance and consider statistical information as being more general and abstract, and therefore less relevant.	Overestimating the pre-test probability of pulmonary embolism in a very low-risk patient and ordering a complete work-up because of the seriousness of the condition, despite how statistically unlikely it is to be the diagnosis.	Hearing hooves and thinking zebras not horses	- Familiarise yourself with the prevalence rate of the disease - Use clinical decision support tools - Determine the likelihood ratios	Common things are common

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7	Commission Bias 	Results from a beneficent view that harm to the patient can only be prevented by active investigation or intervention. It is the tendency towards action rather than inaction; and believing that more is better.	We have a natural aversion to ambiguity or uncertainty and a desire for control, so taking action is a way of combatting those aversions and creating a sense of control. Doing something feels like we are being helpful. Doing nothing feels unhelpful.	Diagnosing bacterial tonsillitis and prescribing antibiotics in a patient with a sore throat 'just in case', even though the history and examination findings suggest viral pharyngitis.	Don't just stand there, do something	- Conduct a risk-benefit analysis of taking action - Follow protocols that outline criteria for action - Consider pros and cons of 'nil or minimal action' as a treatment option	Tincture of time
8	Confirmation Bias 	Assigning weight to information that supports your diagnosis and discounting information that does not (diagnostic momentum and anchoring bias are subsets of confirmation bias).	This is one way in which our brains sort through large amounts of information more efficiently. The self-selecting positive reinforcement reduces cognitive dissonance and builds a sense of confidence. It is common for people to form a quick opinion, and then find a way to justify it. This is called motivated reasoning.	Attributing a patient's back pain to a muscular sprain because the first thing you hear from the patient is that the pain occurred after lifting something awkwardly and eased with rest and simple analgesia (ignoring the history of severe osteoporosis and previous atraumatic fractures).	Hammers see nails	Use open questions and avoid leading questions - Ask yourself "what doesn't fit?" - Identify disconfirming evidence by asking "what evidence would show me I'm wrong?"	Take the blinkers* off *'Blinders' (American English)
9	Diagnostic Momentum 	The tendency for a diagnosis to be accepted and passed on without consideration or critical analysis of the available information (where the diagnostic label becomes attached to the patient). The initial label can come from the patient, their carers or healthcare staff.	This occurs more commonly when there are pressures to make a quick diagnosis, and an early hypothesis is transformed into an accepted truth. Confirmation bias, anchoring bias, and authority bias can all reinforce diagnostic momentum.	A patient arrives in the ED with a handover from ambulance officers that the patient has abdominal pain and is constipated. Their abdominal pain continues to be treated as constipation to the exclusion of investigations and other possible differential diagnoses.	Written in stone	- Be vigilant at handovers of care - Have a low threshold to verify information when you are the clinician responsible for care - Reassess the diagnosis when new information comes to light	Take it with a grain of salt

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10	Framing Effect 	Favouring certain diagnoses according to how the problem is described.	We focus on certain aspects of a problem, leaving others in the shadows, because of the way information is represented. Our prior knowledge and training also influence which aspects of a problem we attend to.	An older patient experiencing shortness of breath is worked up for cardiac failure because the medical handover emphasises a history of aortic stenosis. However, the handover did not relay the history of a recent fall onto their upper back with bruising over their scapula, so a traumatic cause for the patient's breathlessness is overlooked.	Missing the elephant while studying its tail	- Purposefully reframe the information - Ask "What information is missing"? - Consult with clinicians/ others who might have a different perspective	Step back to see the big picture
11	Fundamental Attribution Error 	The tendency to attribute a patient's behaviour to their personality, rather than their circumstances when formulating a diagnosis.	We are hard-wired to make quick judgements about people and over-attribute behaviour to personality. We readily see a person's behaviour but may be blind to the situational constraints or conditions that are driving that behaviour.	A patient behaving aggressively with slurred speech, difficulty walking, and a known history of schizophrenia and alcohol use disorder requires sedation for his behaviour. He is diagnosed with intoxication, but it is later discovered that his blood alcohol reading is zero and he has a small cerebrovascular haemorrhage.	Seeing the actor without the stage	- Be curious and ask questions about their behaviour - Recognise that our attributions are usually guesses, and we can easily be wrong - Imagine the situation from their perspective	Walk a mile in their shoes
12	Gambler's Fallacy 	A belief that if a particular event occurred more frequently than average in the past it is less likely to happen in the future – even though the probability of the event occurring in the future is independent of what happened in the past.	This stems from our tendency to want to make sense of random events, and an attempt to rationalise those events to make them seem more predictable. We also see patterns in randomness.	A clinician sees a number of patients in clinic with inflamed joints that prove to be septic arthritis. The clinician presumes that the sequence of the diagnosis in question would not continue in the next patient and starts thinking of alternative diagnoses even if the presentation is highly suggestive of septic arthritis.	Playing the odds	- Remember the principles of probability and randomness - Evaluate the problem as an independent event and actively exclude consideration of past occurrence - Test the logic of the diagnosis	Clear the ledger

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13	Hindsight Bias 	The tendency to over-estimate the prior predictability of a diagnosis after it is known. This can manifest in the belief that a correct diagnosis or treatment path should have been apparent to the clinicians at the time, without realizing that it only seems obvious in retrospect.	How we interpret past events is affected by how we reconstruct memories and make sense of the world around us. We tend to exaggerate our ability to predict events and revise the probability or knowledge of a diagnosis after the fact. Events make more sense in retrospect, when all of the relevant information is in.	Reviewing a case of a missed presentation of sepsis and assuming that the correct diagnosis should have been easy to make (thereby failing to appreciate the systemic or complex patient factors that led to the missed diagnosis, and limiting the ability to learn from the case).	Hindsight is 20/20	- Consider the time course of the events - Evaluate the constraints, uncertainties, data and assumptions that were present when the diagnosis was made - Think about why incorrect diagnoses might have appeared to be correct	You can't see around corners
14	Group Think 	Accepting the consensus of a group and individuals and failing to undertake or voice clinical reasoning of their own; a type of premature closure on a group level.	This is more likely to occur when the dynamics of the group are influenced by hierarchical powers, decision-making stress, pressure for conformity, and homogeneity amongst the group members. People can also assume others know better than them, or they may assume that because no one is voicing a counter opinion, this means everyone else agrees. However, it could be that everyone has the same concerns that a diagnosis is incorrect, and no one is speaking up.	A patient with confusion and leg ulcers is admitted to hospital with a diagnosis of delirium. They are treated with antibiotics and fentanyl patches, but their confusion worsens over a number of weeks. Several members of the medical team discuss the patient, with the lead clinician attributing the symptoms to the ulcers. Others on the team are concerned about opiate toxicity but each assumes that because no one mentions this, they must be wrong. The team increases the medication dose, and the patient becomes unconscious as a result of missed opiate toxicity.	Running with the pack	- Create an environment of psychological safety so that people feel comfortable to share a range of viewpoints - Include raising alternative hypotheses and questioning assumptions as part of the group discussion - Admit uncertainty	Go against the tide

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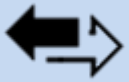
15	Omission Bias 	The tendency towards inaction stemming from a non-maleficence view and making a diagnosis that does not require an action or requires a simpler action. Avoiding something that is more difficult to do and believing that less is better.	This arises from a desire to simplify decision-making and alleviate feelings of guilt through the notion that actions that lead to negative consequences create more guilt than inaction that results in a negative outcome.	Diagnosing a patient complaining of a headache with a tension headache and failing to consider meningitis as a differential diagnosis because it would be difficult and painful to perform a lumbar puncture on the patient.	Letting sleeping dogs lie	- Reflect on the immediate consequences of both action and inaction - Reflect on the more distant consequences of action and inaction - Consider moral obligations, ethical principles, and duty of care	Nothing ventured, nothing gained
16	Outcome Bias (in the prospective sense) 	The tendency to favour a less severe diagnosis in decision-making for what one hopes will happen rather than what one really believes might happen. This may result in serious diagnoses being minimised.	This occurs when we de-emphasise the events that precede the outcome and over-emphasize the outcome (or weight the outcome more heavily than other pieces of information).	Diagnosing a young woman with lethargy, heavy menstruation, and easy bruising as being iron deficient and missing the diagnosis of a haematological malignancy.	Wishful thinking	- Focus on the quality of the process in making the diagnosis - Promote an evidence-based approach using empirical evidence and clinical guidelines - Seek a second opinion	Get to the heart of the matter
	Outcome bias (in the retrospective sense) 	The tendency to judge the quality of a decision on the basis of the outcome, rather than how that decision was made with the available information at the time. This is similar but distinguishable from hindsight bias, which is the tendency for people with knowledge of the actual outcome of an event to believe falsely that they would have predicted the outcome.	We tend to attribute blame more readily in scenarios where the outcome is poor and serious. This stems from a belief that the quality of a decision is the sole determinant of a good or bad result, rather than looking at the factors that impacted on the decision-making process. Sometimes a good outcome can happen despite a poor clinical decision, and vice versa.	Reviewing a case where a child presented with a fever and mild cough but appeared well with normal vital signs and no respiratory distress. The clinician considers the need for a chest X-ray and antibiotics but based on their clinical examination and guidelines for managing febrile children, diagnoses a viral infection and recommends anti-pyrexial medication and early review. The child deteriorates the next day and requires an intensive care unit admission for a week. The case is later reviewed by two paediatricians. The first is not aware of the outcome and supports the clinical decision-making. The second is aware of the outcome and criticises the decision not to obtain imaging or commence antibiotics in the first instance.	No harm no foul	- Review the quality of the diagnostic process independent of the outcome - Learn from near misses - Consider the context within which the decision was made	It's not whether you win or lose, but how you play the game

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17	Premature Closure 	Failing to seek additional information or consider reasonable alternatives after an initial diagnosis is made.	We are hard wired to spot patterns to make sense of things, which is usually very helpful. Once we think we understand something, we are not inclined to look for an alternate pattern or explanation as we are used to our initial impressions being correct.	Diagnosing an open ankle fracture in a man who has fallen off a ladder but failing to check for other injuries and missing a subdural bleed.	Jumping to conclusions	- Be thorough with the history and examination - Use a systematic approach for patient assessment - Consider a differential diagnosis	Look before you leap
18	Representativeness Bias 	The tendency to judge the likelihood of a diagnosis based on a typical prototype of the diagnosis, regardless of the actual probability of the diagnosis (while atypical presentations are more likely to be missed).	We often determine the likelihood of a diagnosis by assessing how similar it is to known or past experiences that we think should be representative of an outcome.	Missing the diagnosis of a thoracic aortic dissection because the presentation did not include a description of searing chest pain radiating through to the back.	Sticking to the script	- Incorporate a consideration of prevalence into your thinking - Seek collateral information - Understand the range of presentations for any given condition	Not everything is textbook
19	Status Quo Bias 	The tendency to prefer the current state of affairs, with a preference for familiarity in diagnosis. It is more likely to occur when there is choice overload or high uncertainty.	We prefer to stick to the norm because we are risk averse, and change can invoke a sense of uncertainty and loss, and choice can create a feeling of being overwhelmed.	Attributing pain and numbness in the foot to peripheral neuropathy and referring the patient to a podiatrist. When the patient re-presents several times with similar symptoms, they are re-referred to the podiatrist without examination, until they eventually return with a pulseless leg. The possible diagnoses were broad and included vascular, neurological, and musculoskeletal, which may have paradoxically increased the preference for the initial diagnosis of peripheral neuropathy.	If it ain't broke, don't fix it	- Ask yourself why the current diagnosis is preferred - Assess the risks and limitations of the current diagnosis - Deliberately analyse the likelihood of an alternate diagnosis	Out with the old and in with the new

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20	Sunk Cost Fallacy 	When a diagnosis is held even when it is not supported by the findings, because of the time, mental energy and resources that have already been put into it (an unwillingness to let go of a failing diagnosis).	We are sensitive to losses and avoid the perceived loss with abandoning a diagnosis that we have invested so much into already (cognitively, financially, emotionally, temporally). It is always difficult to admit failure or that an initial decision/investment was wrong.	A patient has an abnormal brain MRI showing multiple lesions and is diagnosed with multiple sclerosis and treated with immunotherapy. This management is continued at subsequent reviews even though the treatment has had little effect. Years later the patient is re-evaluated by a different team and determined to have cerebral small vessel disease and not multiple sclerosis.	Throwing good money after bad	- Set the pre-existing investments aside and focus on the future costs and benefits of an alternate diagnosis - Establish clear criteria to guide decision-making about a diagnosis - Seek input from impartial peers	Cut your losses
21	Triage Cueing 	When a specific discipline tends to look at the patient only through their perspective, and the disposition of a patient cues their diagnosis.	We have a natural inclination to utilise information that is most familiar to us when we are evaluating potential diagnoses and outcomes. This is closely related to framing bias and availability bias and arises from our own contextual experiences and the patient's location.	A patient with peptic ulcer disease admitted under the gastroenterology team for investigation of anaemia develops chest pain and is treated with antacids and a proton pump inhibitor. The patient deteriorates several hours later, and an electrocardiograph reveals an acute myocardial infarction.	Geography is destiny	- Focus on symptoms and signs rather than labels - Independently obtain information from the patient - Think beyond the patient's location and ask yourself whether they are in the right place	Look through a different lens