Types and Definitions of Cognitive Biases

Cognitive Bias	Description
Aggregate	The belief that aggregated data, such as those used to develop CPGs, do not apply to the individual patient (especially their own). This leads to errors of commission (e.g. order CXR when not indicated)
Anchoring	The inclination to lock onto a diagnosis early on and failing to reconsider after receiving contradictory information
Ascertainment	Occurs when a physician's thinking is shaped by prior expectation; (e.g. stereotyping and gender bias)
Availability	The tendency to judge things as being more likely to occur due to recent exposure to similar situations. Conversely, if a disease has not been seen for a long time (is less available), it may be under diagnosed.
Base-rate neglect	The tendency to ignore the true prevalence of disease and therefore either inflating or reducing its base-rate; often practiced in the strategy of "ruling out the worst case scenario"
Commission	Results from the obligation toward beneficence, in that harm to the patient can only be prevented by active intervention. It is the tendency toward action rather than inaction. It is more likely in over-confident physicians. Commission bias is less common than omission bias.
Confirmation	The tendency to look for confirming evidence to support a diagnosis rather than look for disconfirming evidence to refute it, despite the latter often being more persuasive and definitive.
Context errors	The critical signal is distorted by the background against which it is perceived
Diagnosis momentum	Patients receive their diagnostic "label" and their diagnosis is carried on from person to person without being challenged
Feedback Sanction	A form of ignorance trap and time-delay trap. Making a diagnostic error may carry no immediate consequences, as considerable time may elapse before the error is discovered, if ever. Or poor system feedback processes prevent important information on decisions getting back to the decision maker.
Framing effect	How diagnosticians see things may be strongly influenced by the way in which the problem is framed, (e.g., physicians' perceptions of risk to the patient may be strongly influenced by whether the outcome is expressed in terms of the possibility that the patient might die or might live). In terms of diagnosis, physicians should be aware of how patients, nurses, and other physicians frame potential outcomes and contingencies of the clinical problem to them.
Fundamental attribution error	The tendency to be judgmental and blame patients for their illnesses (dispositional causes) rather than examine the circumstances (situational factors) that might have been responsible. In particular, psychiatric patients, minorities, and other marginalized groups tend to suffer from this error. Cultural differences exist in terms of the respective weights attributed to dispositional and situational factors.
Gambler's fallacy	Attributed to gamblers, this fallacy is the belief that if a coin is tossed ten times and is heads each time, the 11th toss has a greater chance of being tails (even though a fair coin has no memory) (e.g. a physician sees a series of patients with chest pain in clinic or the emergency

	department, diagnoses all of them with an acute coronary syndrome, and assumes the sequence will not continue). Thus, the pretest probability that a patient will have a particular diagnosis might be influenced by preceding but independent events.
Gender	The predisposition to believe that gender plays a role in the likelihood of diagnosis when no such trend exists
Heuristics	Mental shortcuts used in cognitive reasoning to solve problems with minimal effort, ie, “rules of thumb.” Based on previous knowledge and experiences but may lead to mistakes
Hindsight	Knowing the outcome may profoundly influence the perception of past events and prevent a realistic appraisal of what actually occurred. In the context of diagnostic error, it may compromise learning through either an underestimation (illusion of failure) or overestimation (illusion of control) of the decision maker’s abilities.
Omission	The tendency toward inaction and rooted in the principle of nonmaleficence. In hindsight, events that have occurred through the natural progression of a disease are more acceptable than those that may be attributed directly to the action of the physician. The bias may be sustained by the reinforcement often associated with not doing anything, but it may prove disastrous. Omission biases typically outnumber commission biases.
Order Effects	Information transfer is a U-function: we tend to remember the beginning part (primacy effect) or the end (recency effect). Primacy effect may be augmented by anchoring. In transitions of care, in which information transferred from patients, nurses, or other physicians is being evaluated, care should be taken to give due consideration to all information, regardless of the order in which it was presented.
Outcome	The predisposition to make diagnostic decisions that will lead to good outcomes; physicians lean toward making decisions targeted toward what they hope might happen rather than what they really believe might happen
Overconfidence bias	The tendency to believe we know more than we do, or that we are correct more frequently than we really are
Playing the odds	AKA: frequency gambling. Is the tendency in equivocal or ambiguous presentations to opt for a benign diagnosis on the basis that it is significantly more likely than a serious one. It may be compounded by the fact that the signs and symptoms of many common and benign diseases are mimicked by more serious and rare ones. The strategy may be unwitting or deliberate and is diametrically opposed to the rule out worst-case scenario strategy (see base-rate neglect).
Posterior probability error	Occurs when a physician’s estimate for the likelihood of disease is unduly influenced by what has gone on before for a particular patient. It is the opposite of the gambler’s fallacy in that the physician is gambling on the sequence continuing, (e.g., if a patient presents to the office five times with a headache that is correctly diagnosed as migraine on each visit, it is the tendency to diagnose migraine on the sixth visit). Common things for most patients continue to be common, and the potential for a nonbenign headache being diagnosed is lowered through posterior probability.
Premature closure	The tendency to accept a diagnosis before it has been fully confirmed

Representativeness restraint	The physician looks for prototypical manifestations of disease (pattern recognition) and fails to consider atypical variants
Search Satisficing	The tendency to call off the search when something is found (combination of satisfying and sufficient)
Sutton's slip	Comes from story of Willie Sutton a Brooklyn bank-robber. When asked by the Judge why he robbed banks, it is alleged that he replied: ''Because that's where the money is!'' The diagnostic strategy of going for the obvious is referred to as Sutton's law. The slip occurs when possibilities other than the obvious are not given sufficient consideration.
Sunk costs	The more clinicians invest in a particular diagnosis, the less likely they may be to release it and consider alternatives. This is an entrapment Form; associated with investment and financial considerations. However, for the diagnostician, the investment is time and mental energy and, for some, ego may be a precious investment. Confirmation bias may be a manifestation of such an unwillingness to let go of a failing diagnosis.
Triage cueing	The triage process occurs throughout the health care system, from the self-triage of patients to the selection of a specialist by the referring physician. In the emergency department, triage is a formal process that results in patients being sent in particular directions, which cues their subsequent management. Many errors are initiated at triage, leading to the maxim: ''Geography is destiny.''
Unpacking principle	The failure to elicit all relevant information in establishing a differential diagnosis
Vertical line failure	Routine, repetitive tasks often lead to thinking in silos—predictable, orthodox styles that emphasize economy, efficacy, and utility. Though often rewarded, the approach carries the inherent penalty of inflexibility. In contrast, lateral thinking styles create opportunities for diagnosing the unexpected, rare, or esoteric. An effective lateral thinking strategy is simply to pose the question: ''What else might this be?''
Visceral	The influence of affective sources of error on decision-making has been widely underestimated. Visceral arousal leads to poor decisions. Counter transference, both negative and positive feelings toward patients, may result in diagnoses being missed. Some attribution phenomena (fundamental attribution error) may have their origin in counter transference.
Yin-Yang out	When patients have been subjected to exhaustive and unavailing diagnostic investigations, they are said to have been worked up the "Yin-Yang". The Yin-Yang out is the tendency to believe that nothing further can be done to throw light on the dark place where, and if, any definitive diagnosis resides for the patient,(i.e., the physician is let out of further diagnostic effort). This may prove ultimately to be true, but to adopt the strategy at the outset is fraught with the chance of a variety of errors.