

Note: Page references in *italics* refer to Figures; those in **bold** refer to Tables and Boxes

- abductive reasoning 18, **18**
- absolute risk 42, **42**
- active consciousness 33
- adverse event 27–8, **28**
- affective biases 4
- alcohol, performance and 30
- algorithms 42
- Alvarado score **16**
- analytical decision-making 3
- anchoring **21**, 23, 24, **25**, 35
- APGAR score 35–6, **35**
- ascertainment bias **25**
- attribution error **25**
- Augenblick* diagnoses 34
- availability bias 24, **25**

- base rate neglect **25**
- Bayes' theorem 14, **14**, 19
- belief biases 24
- bias
 - affective 4
 - ascertainment **25**
 - availability 24, **25**
 - belief 24
 - blind-spot 36
 - commission 24, **25**
 - confirmation **21**, 22, 23, **25**, 33, 37
 - decision making 24
 - memory 24
 - outcome **21**
 - overconfidence 24
 - social 24
 - status quo 36
 - see also* cognitive biases
- blind-spot bias 36
- body position, effect of, on test results 13
- british automatism 33, 34

- CAGE Questionnaire 42
- causal and rule-based (categorical) reasoning 19
- categorical reasoning 19
- caveats 35, 36
- checklists 35, **35**
- chest pain history 6, **8**
- chunking of knowledge 45, **46**
- clinical assessment 39
- clinical errors **28**
 - see also* errors
- clinical guidelines 39, **40**
 - inappropriate use of 41–2, **41**
 - pitfalls of using 40–1, **41**
 - in practice 42–3
 - risk 42–4
- clinical judgement 39
- clinical prediction rules **35**
- clinical reasoning
 - definition of 1–2, **2**
 - history and examination 2–3, 3
 - importance of 2, 4
- coaching 5
- cognitive biases 3, 19, 22–6, 45
 - case history 22–3
 - expert intuition and 24–6, 26
 - types of 24, **24**, **25**
- cognitive debiasing 34–8
 - challenges of 36–7, **37**
 - characteristics of **37**
 - newly evolving strategies 36
 - situations 36

cognitive psychology 1–2
 cognitive psychometric testing 30
 cognitive skills, failures in 27
 cognitive traps 3, 22
 cohort studies 39
 commission bias 24, 25
 communication skills 1, 42
 failures in 27
 within teams 30–1
 computed tomography (CT) 13
 CT angiography 3
 CT head 16
 concept maps (trees) 46, 47
 confirmation bias 21, 22, 23, 25, 33, 37
 confirmation of hypothesis 19
 controlled trials 39
 critical thinking 45

D-dimer test 16, 40
 debiasing strategies 45
 debriefings 48
 decision aids 39–40, 45
 pitfalls of using 40–1
 decision fatigue 22
 decision making biases 24
 deductive reasoning 17, 18, 18
 deliberate practice 5, 47
 diagnostic error 2, 20–1, 44
 causes of 2
 economic waste 4
 diagnostic grand rounds 48
 diagnostic momentum 23, 23, 25
 diagnostic tests 1, 12–16, 45
 disease prevalence in population 14–15, 15
 distribution of result 12–13, 13
 influences on results 12–13
 misinterpretation of 20, 21
 normal values 12
 operating characteristics 13
 probability and 3
 sensitivity and specificity 13–14, 13
 thresholds 15–16, 16
 Diagnostic Thinking Inventory (DTI) 48
 differential diagnosis 19, 35, 35
 disconfirmation of hypothesis 19
 discrimination between hypotheses 19
 dual process theory 3, 17, 19–20, 21, 24, 26, 33, 34, 34, 39, 45

echocardiography 13
 electroencephalography (EEG) 13
 ergonomics *see* human factors
 error chain 28
 errors
 attribution 25
 clinical 28
 cognitive 20, 21, 21 33, 44
 in decision-making 3–4
 diagnostic 2, 2, 4, 20–1, 44
 in healthcare 27–9

knowledge gaps 20, 21
 misinterpretation of diagnostic tests 20, 21
 no fault 20, 21
 posterior probability 21
 system 20, 21, 21
 types of 17
 evidence-based history and examination 2–3, 3, 6–11, 34, 35, 45
 combining clinical findings 11
 coronary artery disease diagnosis example 10–11, 10
 diagnosis from 6
 evidence-based history 6–7
 key symptoms 6, 7, 7
 limitations of 9–10, 9
 natural history and context 7–8
 evidence-based medicine 1, 35, 35, 41, 41
 examination *see* evidence-based history and examination
 executive override 34
 experience 24
 expert intuition 24–6, 26
 experts vs novices, reasoning of 21

false positives and negatives 12, 13
 fatigue, adverse effects on performance 29, 30
 feedback 5
 fire safety training 31
 forcing functions 36
 forward thinking 46, 47

guidelines 45

Hawthorne effect 17
 Heinrich ratio 28
 heuristics 21, 24, 24, 33
 human factors 27–32
 human factors engineering 28, 28
 human factors training 30, 31–2
 hierarchy of 32, 32
 hypothesis generation 19, 20
 hypothesis modification 19, 20
 hypothesis refinement 19
 hypothetico-deductive reasoning 17–18, 19

I-PASS mnemonic 36
 illness, adverse effects on performance 29
 illness scripts 44, 45, 48
 imaging stress test 15, 15
 incidentalomas 13
 inductive reasoning 18, 18
 Integrated case learning 48
 INTERHEART study 8
 intuitive decision-making 3
 iterative diagnosis 19

knowledge gaps 19, 20, 21

latent conditions 28
 learning by osmosis 21
 likelihood ratio (LR) 7, 8–9, 8, 9, 9, 10, 11
 limitations of human performance 29–39

- management plan formulation 45
- medicalising of patients' problems 4, 4
- memory biases 34
- metacognition 3, 4, 24, 33–8, 37, 48
- mind maps 46–7
- mindware 36–7, 37
- mnemonics 35–6, 35
- MUDPILES mnemonic 36, 36
- natural history of disease 7–8
- neglect of probability 22
- New York Heart Association's Functional Classification of Heart Failure 8, 8
- night work, adverse effects on decision making 29
- nudging strategies 36
- One Minute Preceptor 48
- optical illusions 29
- Ottawa Ankle Rule 35, 40, 40
- outcome bias 21
- overconfidence bias 24
- overdiagnosis 4, 4
- passive consciousness 33
- Patient Decision Aids (PDAs) 43, 43
- pattern recognition 24, 46
- pitfalls 35, 36, 40–1
- posterior probability error 21
- predictive values 15, 15
- pregnancy, effect of, on test results 13
- premature closure 21, 35
- probabilistic reasoning 19, 45
- probability 3, 3, 24
 - conditional 13
 - pre-test (clinical) 13, 14, 16
- problem representation 45, 46
- problem-solving clinical seminars 48
- problem spaces 2, 2
- prolongation of life 42, 42
- reasoning, types of 18
- red flags 31, 31, 35, 36
- 'reflection-in-action' 48–9, 48, 49
- 'reflection-on-action' 48
- Rome II criteria for irritable bowel syndrome 40, 40
- root causes 28
- ROWS 35, 36
- rule-based/categorical/deterministic reasoning 18, 18
- rules out the worst case scenario (ROWS) 35, 36
- SBAR (situation, background, assessment, recommendation) system
 - of communication 31, 31
- scores 39–40, 45
 - pitfalls of using 40–1
- search satisficing 21, 23, 35
- semantic competence 45, 46
- semantic qualifiers 46
- shared decision-making 1, 42–3, 45
- simulation 48
- situation awareness 29, 29
- sleep deprivation 30
- social biases 24
- spiral curriculum 44, 45, 46
- spirometry testing 3
- spot diagnoses 34
- STARD criteria 11
- status quo bias 36
- stereotyping 24
- 'Stop and Think' framework 49, 49
- stress, adverse effects on performance 29
- sunk cost fallacy 22
- Swiss cheese model of accident causation 28, 28
- systematic review 39
- tacit knowledge 26
- teaching/training in clinical reasoning 44–50
 - case-based interventions 48
 - educational theories 45–7, 47
 - illness scripts 44, 45, 48
 - metacognition strategies 48
 - problem list 44
 - reflection in clinical reasoning 48–9
 - spiral curriculum 44, 45, 46
 - syllabus 45
 - teaching techniques 47–8
- therapeutic threshold 15
- time outs 48
- two feet principle 41, 41
- two minds hypothesis *see* dual process theory
- type 1 thinking 19–20, 21, 22, 23, 24, 26, 30, 33, 34
- type 2 thinking 19–20, 21, 22, 24, 26, 30, 33, 34
- ultrasound 13
- Universal Model of Diagnostic reasoning (Croskerry) 20, 20
- unpacking principle 34
- values-based practice 41, 41
- virtual learning patients 48
- Wells' criteria for pulmonary embolus 35
- WHO safe surgery checklist 31
- working diagnosis 20
- workload, excessive, adverse effects on performance 29