

COMPREHENSIVE MOCK EXAM 8

Supplemental to: Pain Medicine Board Review 2026-2027

Travis L. Bricker

*American Board of Anesthesiology (ABA) Pain Medicine Certification Examination --
200 questions, single-best-answer (3-option A-C), domain-weighted per official ABA
blueprint*

Board-Review Questions

1. A researcher applies a series of identical, repeated noxious stimuli at a constant intensity to a volunteer's skin and finds that the perceived pain intensity progressively increases with each successive stimulus, even though the stimulus itself never changes. What phenomenon does this describe?

- A. Habituation, a progressive decrease in perceptual response to a repeated identical stimulus over time
- B. Allodynia, a pain sensation triggered by a stimulus that is not normally considered painful at all
- C. Temporal summation, an increase in perceived pain intensity from repeated identical noxious stimuli

2. A physiology lecture explains a foundational model in which activity in large-diameter, non-nociceptive afferent fibers can inhibit the transmission of nociceptive signals at the spinal dorsal horn, providing the theoretical basis for treatments such as rubbing an injured area to reduce pain. What theory is being described?

- A. The neuromatrix theory, a broader distributed brain network model of pain perception
- B. Gate control theory, in which large-fiber input inhibits nociceptive transmission at the dorsal horn
- C. The biopsychosocial model, spanning biological, psychological, and social contributing factors

3. A researcher proposes that chronic pain develops when a person with an underlying biological or psychological vulnerability (such as a genetic predisposition or maladaptive coping style) is exposed to a significant stressor (such as an injury or major life event), with neither factor alone being sufficient to produce the outcome. What model does this represent?

- A. The gate control theory of pain signal transmission at the level of the spinal cord
- B. The diathesis-stress model, combining an underlying vulnerability with a significant stressor
- C. The WHO analgesic ladder, a stepwise pharmacologic treatment escalation framework

4. A retrospective study finds that patients who sought care at a specialized pain clinic had better outcomes than those treated in general practice, but the researchers note that patients who seek out specialized clinics may differ systematically from those who do not (for example, having more resources

or motivation), which could account for some of the observed difference. What type of bias does this represent?

- A.** Selection bias, from systematic differences between patients who chose one setting over another
- B.** Recall bias, from differences in how patients remember and report past exposures
- C.** Publication bias, from selective publication of studies with positive results

5. In a randomized controlled trial of a new analgesic, the study team ensures that the person enrolling participants and assigning them to treatment groups has no way of knowing or influencing which group an upcoming participant will be assigned to, using a centralized, independent randomization system. What methodological safeguard does this represent?

- A.** Double-blinding of both the study participants and the outcome assessors throughout the trial
- B.** Intention-to-treat analysis applied to the trial's final collected outcome results
- C.** Allocation concealment, preventing foreknowledge of upcoming group assignment during enrollment

6. A pain physician respects a competent patient's decision to decline a recommended interventional procedure after a thorough discussion of risks, benefits, and alternatives, even though the physician believes the procedure would likely help. Which core ethical principle is most directly being honored in this scenario?

- A.** Beneficence, the physician's obligation to act for the patient's overall benefit
- B.** Non-maleficence, the obligation to avoid causing the patient unnecessary harm
- C.** Autonomy, the patient's right to accept or decline recommended treatment after discussion

7. A hospital pain program with limited interventional procedure appointment slots develops a transparent, criteria-based system for prioritizing which patients receive the next available slots, rather than a first-come-first-served or informal approach, aiming for a fair distribution of this limited resource across the patient population. Which core ethical principle does this system primarily reflect?

- A.** Justice, the fair and equitable distribution of limited healthcare resources
- B.** Fidelity, the obligation to keep commitments made to patients
- C.** Veracity, the obligation to be truthful with patients

8. A pain physician who receives consulting fees from a pharmaceutical company is invited to give a lecture recommending that company's medication, and discloses this financial relationship to the audience at the start of the talk, as required by the conference's policy. What practice does this represent?

- A.** HIPAA-mandated disclosure of the patient's own protected health information to a third party
- B.** Conflict of interest disclosure, informing the audience of a financial relationship that could influence recommendations
- C.** Informed consent obtained specifically for a proposed medical procedure or intervention itself

9. A pain clinic hires an advanced practice clinician who has completed a graduate nursing program with additional certification, and who can independently evaluate patients, diagnose conditions, and prescribe certain medications within limits that vary depending on the specific state's regulations. What type of provider is being described?

- A.** A licensed physician assistant, whose scope is defined identically in every state
- B.** A nurse practitioner, whose independent practice authority and prescribing scope varies by state regulation
- C.** A licensed clinical psychologist, who cannot prescribe medication in any state

10. A pain clinic requires patients on long-term opioid therapy to sign a document outlining expectations such as using a single designated pharmacy, submitting to periodic urine drug testing, and safe medication storage, with the terms clearly explained and agreed upon before therapy begins. What is this document called?

- A.** An advance directive addressing end-of-life care decisions and proxy designation
- B.** A HIPAA authorization form for release of the patient's medical records
- C.** An opioid treatment agreement outlining expectations for long-term opioid therapy

11. A patient is asked to mark a point on a 10-centimeter unmarked horizontal line, with one end labeled "no pain" and the other labeled "worst pain imaginable," and the distance from the "no pain" end is measured to quantify pain intensity. What tool is being used?

- A.** The Visual Analog Scale (VAS), using a marked distance along an unmarked line
- B.** The Numeric Rating Scale, using a selected whole number

C. The Wong-Baker FACES scale, using facial expression images

12. A pediatric nurse assessing pain in a 5-year-old shows the child a row of six cartoon faces ranging from a smiling face to a crying face and asks the child to point to the face that best matches how much pain they are feeling right now. What tool is this?

A. The Wong-Baker FACES pain rating scale

B. The Numeric Rating Scale

C. The Brief Pain Inventory

13. A primary care physician uses a brief 3-item tool asking a patient to rate their average Pain, how much pain has interfered with their Enjoyment of life, and how much pain has interfered with General activity, each on a 0-10 scale, as a quick way to monitor a chronic pain patient at each visit. What tool is this?

A. The full Brief Pain Inventory, a longer multi-item tool

B. The PEG scale (Pain, Enjoyment, General activity), a brief 3-item monitoring tool

C. The Oswestry Disability Index, a back-specific functional tool

14. A physical therapist evaluating a patient with low back pain administers a 24-item yes/no questionnaire asking about specific activities affected by back pain, such as staying at home most of the time or having trouble putting on socks, to quantify back-pain-related disability. What tool is this?

A. The Roland-Morris Disability Questionnaire, a 24-item yes/no back-pain disability tool

B. The Oswestry Disability Index, a percentage-based back-pain disability tool

C. The Pain Catastrophizing Scale, a cognitive-affective tool

15. A researcher applies a series of thin, flexible nylon filaments of increasing stiffness to a patient's skin, one at a time, to determine the minimum force at which the patient can detect a mechanical touch sensation, in order to quantify a mechanical detection threshold. What tool is being used?

A. Von Frey filaments, used to determine mechanical detection thresholds

B. A pressure algometer, used to determine the pressure pain threshold

C. An electromyography needle, used to assess muscle electrical activity

16. A clinician evaluating a patient with chronic low back pain and suspected nerve involvement administers a validated self-report questionnaire assessing pain quality descriptors (such as burning and tingling), pain course over time, and radiation pattern, along with a numeric pain intensity rating, specifically designed to help estimate the likelihood of a neuropathic pain component. Which tool is this?

A. The Oswestry Disability Index, a back-pain-specific functional disability tool

B. The Roland-Morris Disability Questionnaire, a yes/no back-pain disability tool

C. The PainDETECT questionnaire, estimating the likelihood of a neuropathic pain component

17. A clinician evaluating a patient for possible neuropathic pain uses a validated tool that combines a structured pain history interview (assessing descriptors like pricking and electric shocks) with a brief bedside sensory examination (assessing allodynia and altered pinprick threshold), producing a score that helps distinguish neuropathic from nociceptive pain mechanisms. Which tool is this?

A. The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS), combining history and bedside sensory exam findings

B. The Central Sensitization Inventory, a 25-item self-report symptom questionnaire

C. The STarT Back screening tool, stratifying risk of chronic disabling back pain

18. A spine surgeon evaluating a patient with chronic low back pain before a planned procedure notes several findings on physical exam -- pain with light axial loading on the skull, pain with simulated rotation of the trunk and pelvis together, and overreaction to a routine exam maneuver -- that are recognized as inconsistent with a purely structural or organic source of pain. What are these findings collectively called?

A. Straight leg raise findings, indicating lumbar nerve root tension

B. Waddell signs, a set of physical exam findings suggesting a non-organic component to reported pain

C. Spurling test findings, indicating cervical nerve root compression

19. A researcher studying a patient's chronic pain has them wear a small wrist-worn device continuously for two weeks that objectively records movement patterns and sleep-wake cycles, providing objective data on activity level and sleep quality to complement the patient's subjective pain reports. What technology is being used?

- A.** Quantitative sensory testing, measuring sensory thresholds
- B.** Pressure algometry, measuring pressure pain thresholds
- C.** Actigraphy, a wrist-worn device objectively recording movement and sleep-wake patterns

20. A researcher classifies patients with chronic pain into grades ranging from low-intensity/low-disability through high-intensity/severely-limiting, based on a combination of reported pain intensity and pain-related disability scores, to characterize overall chronic pain severity for research and clinical purposes. What classification system is being described?

- A.** The WHO analgesic ladder, a stepwise pharmacologic treatment escalation framework
- B.** The ACR 2016 fibromyalgia diagnostic criteria, a symptom-based diagnostic tool
- C.** The Graded Chronic Pain Scale, classifying severity by combined intensity and disability

21. A patient with significant chronic kidney disease requires opioid analgesia, and the physician selects hydromorphone in preference to morphine, citing hydromorphone's more favorable metabolite profile in renal impairment. What is the pharmacologic rationale for this preference?

- A.** Hydromorphone's active metabolite is present in smaller amounts and is thought to be less clinically significant than morphine's active metabolite, which can accumulate in renal impairment
- B.** Hydromorphone is entirely metabolized by the kidney itself and therefore requires no dose adjustment whatsoever in kidney disease
- C.** Hydromorphone has no analgesic potency advantage over morphine and is selected purely due to lower cost in this population

22. A patient with refractory neuropathic cancer pain is switched to levorphanol, an older opioid with a long half-life that a hospice physician notes has an additional mechanism beyond mu-opioid receptor agonism that may make it particularly useful for pain with a significant neuropathic component. What is this additional mechanism?

- A.** Selective peripheral kappa-opioid receptor agonism, unrelated to any NMDA activity

B. Direct inhibition of cyclooxygenase enzymes, similar to an NSAID

C. NMDA receptor antagonist activity, in addition to mu-opioid receptor agonism, similar conceptually to methadone

23. A hospice pharmacist converting a patient from oral morphine to a different opioid uses a standardized reference table of relative potency ratios between opioids, then applies a dose reduction for incomplete cross-tolerance, to calculate a safe and effective starting dose of the new medication. What principle underlies this calculation process?

A. All opioids are exactly equipotent milligram-for-milligram, so no conversion calculation is ever actually necessary

B. Equianalgesic dosing, using relative potency ratios between opioids combined with a cross-tolerance safety reduction to calculate a starting dose

C. The new opioid should always be started at the identical numeric milligram dose as the prior opioid, regardless of potency differences

24. A pharmacology lecture explains that certain opioid receptor agonists, once they occupy enough receptors, produce no additional analgesic (or respiratory depressant) effect even with further dose increases, unlike full agonists whose effect continues to increase with dose. What pharmacologic class exhibits this property?

A. Full mu-opioid receptor agonists, such as morphine or fentanyl, at increasing doses

B. Peripherally acting mu-opioid receptor antagonists, used for opioid-induced constipation

C. Partial agonists, which exhibit a ceiling effect on maximal response with further dose increases

25. A postoperative nursing unit uses a standardized scale to assess a patient's level of sedation at regular intervals after opioid administration, with specific numeric levels corresponding to descriptions from fully awake through difficult to arouse, used to trigger a nursing response before respiratory depression develops. What is this monitoring tool called?

A. The Glasgow Coma Scale, assessing level of consciousness after brain injury

B. The Pasero Opioid-Induced Sedation Scale (POSS), assessing sedation level to preempt opioid-related respiratory depression

C. The Ramsay Sedation Scale, used specifically for ICU ventilator sedation titration

26. A combination sublingual product contains both buprenorphine and naloxone, with the naloxone included specifically because it has poor sublingual bioavailability but would precipitate withdrawal if the product were dissolved and injected intravenously instead. What is the purpose of including naloxone in this formulation?

- A.** To deter intravenous misuse of the product, since injected naloxone would precipitate opioid withdrawal while sublingual naloxone remains largely inactive
- B.** To provide additional analgesic effect beyond buprenorphine alone, through an entirely separate receptor mechanism
- C.** To prevent buprenorphine from being absorbed sublingually at all, ensuring the product has no clinical effect unless injected

27. A researcher studying long-term high-dose opioid therapy notes emerging evidence that chronic opioid exposure may alter natural killer cell activity and other immune parameters, an effect distinct from opioids' analgesic, sedative, or gastrointestinal effects. What opioid-related effect does this describe?

- A.** Opioid-induced hyperalgesia, a paradoxical increase in pain sensitivity
- B.** Opioid-induced androgen deficiency, from hypothalamic-pituitary-gonadal suppression
- C.** Opioid-induced immunosuppression, from altered immune cell activity with chronic opioid exposure

28. A patient using a transdermal fentanyl patch develops a high fever and separately uses a heating pad directly over the patch site to relieve unrelated muscle soreness. The pharmacist warns that this combination could be dangerous. What is the mechanism of this specific safety concern?

- A.** Heat exposure increases blood flow to the skin and can significantly increase the rate of fentanyl release and absorption from the patch, risking overdose
- B.** Heat exposure has no effect on transdermal fentanyl absorption or release rate under any circumstances
- C.** Heat exposure destroys the fentanyl within the patch, rendering it completely inactive and risking undertreated pain

29. A patient started on indomethacin for an inflammatory arthritis flare reports significant headache, dizziness, and difficulty concentrating shortly after starting the medication, side effects that are

recognized as more prominent with this particular NSAID than with many other agents in its class. What distinguishes indomethacin's side-effect profile?

- A.** Indomethacin is uniquely free of any gastrointestinal side effects compared to all other NSAIDs
- B.** Indomethacin is recognized for a relatively higher rate of central nervous system side effects, including headache and dizziness, compared to many other NSAIDs
- C.** Indomethacin has no central nervous system penetration whatsoever and cannot cause any neurologic side effects

30. A cardiologist reviewing NSAID options for a patient with known coronary artery disease notes that oral diclofenac has been associated with a cardiovascular risk profile similar to or potentially exceeding that of some COX-2-selective agents, despite diclofenac being classified as a nonselective NSAID. What does this observation illustrate?

- A.** All nonselective NSAIDs have an identical, low cardiovascular risk profile with no meaningful variation between agents
- B.** Diclofenac's cardiovascular risk profile has never been meaningfully studied and remains essentially unknown
- C.** Diclofenac exhibits greater COX-2 selectivity than its nonselective classification suggests, giving a cardiovascular risk profile more similar to some COX-2-selective agents

31. A pharmacology lecture explains that COX-1 is constitutively expressed in tissues such as the gastric mucosa and platelets under normal physiologic conditions, while COX-2 is primarily induced at sites of inflammation, though COX-2 does have some constitutive expression in tissues like the kidney and vasculature. What does this distinction help explain?

- A.** Why all NSAIDs, regardless of selectivity, have completely identical side-effect profiles
- B.** Why COX-1 inhibition links more to GI and platelet effects, while COX-2 inhibition drives the anti-inflammatory effect
- C.** Why NSAIDs have no meaningful effect on either gastric mucosal integrity or platelet function

32. An elderly patient who is dehydrated from a gastrointestinal illness takes a routine dose of ibuprofen for a headache and subsequently develops an acute decline in kidney function. What physiologic mechanism explains this increased NSAID nephrotoxicity risk specifically in the setting of volume depletion?

- A.** In volume-depleted states, renal blood flow becomes more dependent on prostaglandin-mediated vasodilation, which NSAIDs block, precipitating acute kidney injury
- B.** Dehydration has no bearing whatsoever on NSAID-related kidney injury risk, and this represents an unrelated coincidental finding
- C.** NSAIDs cause kidney injury exclusively through direct crystal deposition in the renal tubules, unrelated to blood flow or hydration status

33. A cardiologist advises a patient taking daily low-dose aspirin for cardioprotection to take their as-needed ibuprofen dose several hours after, rather than immediately before, the aspirin dose, citing a specific pharmacologic interaction between the two drugs at the platelet level. What is this interaction?

- A.** Ibuprofen has no interaction whatsoever with aspirin's antiplatelet effect at the platelet cyclooxygenase level
- B.** Ibuprofen can competitively block aspirin's access to the platelet COX-1 binding site, potentially interfering with aspirin's irreversible antiplatelet effect if timed incorrectly
- C.** Ibuprofen permanently and irreversibly destroys all circulating platelets, requiring a two-week washout period before aspirin can be restarted

34. A patient with mild chronic kidney disease taking a routine NSAID for arthritis pain is found on follow-up labs to have a mildly elevated serum potassium level, without any change in diet or other medications. What mechanism explains this NSAID-related electrolyte effect?

- A.** NSAIDs directly increase dietary potassium absorption in the gastrointestinal tract, unrelated to any renal effect
- B.** NSAID-related reduction in renal prostaglandin synthesis can reduce renin and aldosterone release, impairing renal potassium excretion and raising serum potassium
- C.** NSAIDs have no plausible mechanism for affecting serum potassium levels under any circumstances

35. A pediatrician cautions a parent against giving aspirin to their child during a viral illness such as influenza or chickenpox, explaining a rare but serious risk specifically associated with aspirin use in children during viral infections. What condition is this warning intended to prevent?

- A.** NSAID-induced acute kidney injury, a general risk not specific to viral illness in children

B. Salicylate-induced tinnitus, a reversible side effect seen with high-dose therapy

C. Reye syndrome, a rare but serious hepatic and neurologic condition tied to aspirin use in children during viral illness

36. A patient with chronic pain and comorbid depression, who is particularly bothered by sedation and weight gain from prior antidepressant trials, is started on bupropion, a medication that works through a distinct monoamine mechanism from typical first-line pain-related antidepressants. What is bupropion's mechanism of action?

A. Norepinephrine-dopamine reuptake inhibition, distinct from the serotonergic mechanisms of SNRIs and TCAs used for pain

B. Selective serotonin reuptake inhibition, identical in mechanism to a typical SSRI antidepressant

C. Direct GABA-B receptor agonism, a mechanism similar to baclofen

37. A patient with chronic pain, significant insomnia, and poor appetite related to advanced illness is started on low-dose mirtazapine, an atypical antidepressant, partly because of two specific secondary effects beyond its antidepressant action that are particularly useful in this clinical scenario. What are these two secondary effects?

A. Stimulant-like alertness and appetite suppression, both of which would worsen this patient's symptoms

B. A diuretic effect and blood pressure lowering, unrelated to sleep or appetite

C. Sedation, useful for insomnia, and appetite stimulation, useful for poor appetite, both recognized secondary effects at lower doses

38. A pain physician explains to a patient why an SSRI (selective serotonin reuptake inhibitor) is generally considered less effective for chronic neuropathic pain than an SNRI (serotonin-norepinephrine reuptake inhibitor), despite both classes affecting serotonin. What is the pharmacologic basis for this difference?

A. Descending inhibitory pathways rely on both serotonergic and noradrenergic transmission, so SNRIs engage a more complete pain-modulating mechanism than SSRIs

B. SSRIs have no effect whatsoever on any neurotransmitter system relevant to pain modulation

C. SNRIs and SSRIs are pharmacologically identical classes, with no meaningful efficacy difference between them

39. A patient with painful diabetic peripheral neuropathy who has not tolerated gabapentin due to sedation is started on lacosamide, a newer anticonvulsant. Through which distinct mechanism does lacosamide act?

A. Alpha-2-delta calcium channel subunit binding, a mechanism identical to gabapentin and pregabalin

B. GABA-A receptor potentiation, a mechanism similar to a benzodiazepine

C. Selective enhancement of slow sodium channel inactivation, a mechanism distinct from gabapentinoids

40. A patient with neuropathic pain is started on zonisamide, an anticonvulsant with multiple proposed mechanisms of action, as an alternative when first-line agents have failed or caused intolerable side effects. Which of the following describes zonisamide's proposed mechanism?

A. Multiple proposed mechanisms including sodium channel blockade, T-type calcium channel blockade, and carbonic anhydrase inhibition

B. A single, precisely defined mechanism of pure alpha-2-delta calcium channel subunit binding only

C. Selective peripheral TRPV1 receptor antagonism as its sole mechanism of action

41. A patient with neuropathic pain asks about trying levetiracetam, having heard it is an anticonvulsant, hoping it might help with their nerve pain. The physician explains that despite being an effective anticonvulsant for seizures, levetiracetam has not shown strong, consistent evidence for treating neuropathic pain in clinical trials. What does this illustrate?

A. All anticonvulsants, without exception, are equally effective for neuropathic pain regardless of their specific evidence base

B. Anticonvulsant efficacy for seizures does not automatically translate to efficacy for neuropathic pain; each agent's specific evidence base for pain must be evaluated independently

C. Levetiracetam is the single most effective anticonvulsant available for neuropathic pain treatment, more so than gabapentin or pregabalin

42. A medical history lecture notes that phenytoin, now used almost exclusively as an antiepileptic, was historically one of the earliest anticonvulsants used off-label for trigeminal neuralgia and other neuropathic pain conditions before newer agents largely replaced it in this role. What is phenytoin's primary mechanism relevant to this historical pain application?

- A.** Voltage-gated sodium channel blockade, stabilizing neuronal membranes and reducing repetitive high-frequency firing
- B.** Selective serotonin reuptake inhibition, identical to an SSRI antidepressant
- C.** Direct mu-opioid receptor agonism, similar to a weak opioid analgesic

43. A patient with refractory central neuropathic pain is started on low-dose memantine, a medication more commonly used for Alzheimer disease, chosen specifically for its receptor mechanism rather than any cognitive indication in this patient. Through which mechanism does memantine act?

- A.** Selective serotonin-norepinephrine reuptake inhibition, a mechanism similar to duloxetine
- B.** Alpha-2-delta calcium channel subunit binding, a mechanism similar to gabapentin
- C.** NMDA receptor antagonism, a mechanism shared with ketamine but via an oral agent

44. A patient undergoing rapid outpatient opioid taper develops autonomic withdrawal symptoms including sweating, anxiety, and elevated blood pressure, and the physician adds low-dose oral clonidine specifically to blunt these autonomic symptoms during the taper. Through what mechanism does clonidine reduce these withdrawal symptoms?

- A.** Direct mu-opioid receptor agonism, simply replacing the tapered opioid's own effect
- B.** Central alpha-2 adrenergic agonism, reducing the noradrenergic surge behind autonomic withdrawal symptoms
- C.** Selective serotonin reuptake inhibition, unrelated to the noradrenergic withdrawal mechanism

45. A patient with frequent migraines and coexisting hypertension is started on propranolol specifically for migraine prevention, allowing the physician to address two conditions with one medication. Through which mechanism is propranolol thought to provide migraine prophylaxis?

- A.** Beta-adrenergic receptor blockade, thought to stabilize cerebral vascular tone and cortical excitability
- B.** Direct serotonin 5-HT_{1B/1D} receptor agonism, identical in mechanism to a triptan

C. Selective peripheral CGRP receptor antagonism, identical to a modern preventive antibody

46. A patient with frequent migraines who prefers to avoid prescription medication asks about nutraceutical options for migraine prevention, and the physician mentions specific supplements that have shown some evidence for reducing migraine frequency. Which of the following is among the nutraceutical options with some supporting evidence for migraine prevention?

- A. Vitamin K supplementation, with no recognized role in migraine prevention
- B. Iron supplementation, with no recognized role in migraine prevention specifically
- C. High-dose riboflavin, magnesium, and coenzyme Q10, with some evidence for migraine-preventive benefit

47. A patient with frequent, disabling migraines who has failed multiple oral preventive medications is started on a monthly subcutaneous injection of a monoclonal antibody that specifically targets a neuropeptide implicated in migraine pathophysiology, representing a newer, migraine-specific preventive mechanism distinct from repurposed drugs like beta-blockers or anticonvulsants. What is the target of this newer class of migraine preventives?

- A. Direct blockade of voltage-gated sodium channels throughout the peripheral nervous system
- B. Calcitonin gene-related peptide (CGRP) or its receptor, a neuropeptide implicated in migraine pathophysiology
- C. Direct blockade of postsynaptic dopamine D2 receptors, similar to an antiemetic

48. A patient having an acute migraine attack is given a medication that acts as an agonist at specific serotonin receptor subtypes on cranial blood vessels and trigeminal nerve terminals, producing vasoconstriction and inhibiting the release of inflammatory neuropeptides, providing acute abortive relief. What class of medication is this, and what is its mechanism?

- A. A beta-blocker, acting through beta-adrenergic receptor blockade for acute abortive relief
- B. An anticonvulsant, acting through voltage-gated sodium channel blockade for acute abortive relief
- C. A triptan, acting as an agonist at 5-HT_{1B/1D} serotonin receptors, producing cranial vasoconstriction and inhibiting inflammatory neuropeptide release

49. During a peripheral nerve block procedure, a large volume of local anesthetic is inadvertently injected directly into a blood vessel, and the patient rapidly develops perioral numbness, tinnitus, and then a seizure followed by cardiac arrhythmia. What is this complication called, and what is the specific antidote used in resuscitation?

- A.** Anaphylaxis, treated with intramuscular epinephrine as the primary antidote
- B.** Local anesthetic systemic toxicity, treated with intravenous lipid emulsion alongside standard resuscitation
- C.** Malignant hyperthermia, treated with dantrolene as its specific antidote

50. A surgeon uses a specialized formulation of bupivacaine, encapsulated in multivesicular lipid particles, infiltrated into a surgical site to provide extended local anesthetic analgesia lasting up to several days, rather than the several hours typical of standard bupivacaine. What formulation is this?

- A.** Standard unencapsulated bupivacaine, with an identical duration of action to any other local anesthetic formulation
- B.** A topical bupivacaine patch, applied to intact skin rather than infiltrated into tissue
- C.** Liposomal bupivacaine, an extended-release formulation using multivesicular lipid particles to prolong local anesthetic duration to several days

51. A patient with CRPS affecting the lower extremity undergoes a diagnostic injection targeting the sympathetic chain anterior to the vertebral bodies at the L2-L4 level, distinct from a similar procedure used for upper extremity sympathetic pain. Which block is this?

- A.** Lumbar sympathetic block, targeting the sympathetic chain for lower extremity sympathetically maintained pain
- B.** Stellate ganglion block, targeting cervical sympathetic innervation to the upper extremity
- C.** Celiac plexus block, targeting abdominal visceral sympathetic innervation

52. A patient with chronic coccydynia (tailbone pain) refractory to conservative therapy undergoes a fluoroscopically guided injection targeting a small sympathetic ganglion located anterior to the sacrococcygeal junction, providing relief of perineal and coccygeal pain. Which structure is targeted?

- A.** The stellate ganglion, located in the anterior neck
- B.** The ganglion impar, a sympathetic structure at the sacrococcygeal junction

C. The celiac plexus, located in the upper abdomen

53. A patient with severe pain from a single displaced rib fracture, not amenable to a paravertebral or epidural approach, undergoes a targeted injection of local anesthetic just below the inferior border of the affected rib, where the neurovascular bundle travels. Which block is this?

- A.** Thoracic paravertebral block, targeting the paravertebral space at multiple levels
- B.** Intercostal nerve block, targeting the neurovascular bundle at the inferior border of a specific rib
- C.** Serratus anterior plane block, targeting a fascial plane over the chest wall

54. A patient with piriformis syndrome not adequately controlled with physical therapy undergoes an ultrasound-guided injection of corticosteroid and local anesthetic directly into the piriformis muscle belly, distinct from a botulinum toxin approach, aiming to reduce inflammation and provide diagnostic confirmation. What is the purpose of this injection technique?

- A.** Combined diagnostic confirmation and anti-inflammatory relief, using a corticosteroid/local anesthetic mixture in the muscle
- B.** Permanent chemical destruction of the piriformis muscle, an irreversible neurolytic technique
- C.** Delivery of an antibiotic into the piriformis muscle to treat an underlying infection

55. A patient with hip pain of uncertain source (joint versus surrounding soft tissue) undergoes a fluoroscopically or ultrasound-guided injection of local anesthetic and contrast directly into the hip joint capsule, with relief of pain supporting the joint itself as the pain generator. What is this procedure called?

- A.** Trochanteric bursa injection, targeting a structure outside the joint capsule
- B.** Hip joint intra-articular injection, targeting the joint capsule itself for diagnostic and therapeutic purposes
- C.** Lumbar sympathetic block, targeting the sympathetic chain rather than the joint

56. A patient with shoulder pain and suspected glenohumeral joint arthritis undergoes an ultrasound-guided injection of corticosteroid directly into the glenohumeral joint space, distinct from a subacromial injection targeting the space above the rotator cuff. What is the purpose of targeting the joint space specifically in this case?

- A.** Treating suspected intra-articular pathology like osteoarthritis, distinct from extra-articular structures like the bursa
- B.** Treating a suspected rotator cuff tear, located within the joint space itself
- C.** To provide systemic anti-inflammatory effect throughout the entire body via joint absorption

57. A patient with moderate knee osteoarthritis and a joint effusion undergoes an ultrasound-guided injection of corticosteroid directly into the knee joint space, both to reduce inflammation and to allow drainage of excess joint fluid at the same visit. What does this combined approach illustrate?

- A.** Corticosteroid injections are never combined with joint aspiration in the same clinical encounter under any circumstances
- B.** Joint aspiration and corticosteroid injection can be combined in the same procedure, providing both diagnostic fluid analysis potential and therapeutic anti-inflammatory relief
- C.** Aspirating joint fluid before injection always worsens the therapeutic effect of the subsequent corticosteroid

58. A patient with lateral hip pain, tenderness over the greater trochanter, and pain with lying on the affected side undergoes an ultrasound-guided injection of corticosteroid and local anesthetic into the space between the greater trochanter and the overlying iliotibial band. What structure is being targeted?

- A.** The trochanteric bursa, targeted for greater trochanteric pain syndrome
- B.** The hip joint capsule itself, targeted for suspected intra-articular pathology
- C.** The piriformis muscle, targeted for suspected piriformis syndrome

59. A patient with mild-to-moderate carpal tunnel syndrome who wants to avoid surgery undergoes an ultrasound-guided injection of corticosteroid into the carpal tunnel, adjacent to but not directly into the median nerve, to reduce inflammation around the nerve. What is the goal of this injection?

- A.** Permanent chemical destruction of the median nerve to eliminate all sensation in the hand
- B.** Direct intraneural injection into the median nerve itself, which is actually the specifically intended and desired injection target
- C.** Reducing local inflammation and swelling within the carpal tunnel to relieve compression on the adjacent median nerve, without injecting directly into the nerve itself

60. A patient with radial-sided wrist pain and a positive Finkelstein test, consistent with De Quervain tenosynovitis, undergoes an ultrasound-guided injection of corticosteroid into the first dorsal compartment tendon sheath. What is the rationale for targeting this specific location?

- A.** The first dorsal compartment has no relationship to De Quervain tenosynovitis at all
- B.** Injection into the wrist joint capsule itself is the standard target for this condition
- C.** De Quervain tenosynovitis involves inflammation of tendons in the first dorsal compartment, the appropriate injection target

61. A patient with chronic plantar fasciitis refractory to stretching, orthotics, and oral NSAIDs undergoes an ultrasound-guided injection of corticosteroid into the origin of the plantar fascia at the calcaneal tuberosity, with the physician counseling about a specific risk associated with this particular injection location. What risk is the physician most likely counseling about?

- A.** Risk of permanent hearing loss occurring as a direct result of the injection
- B.** Risk of plantar fascia rupture or heel fat pad atrophy with repeated injections at this site
- C.** Risk of a new deformity developing in the opposite, uninjected foot

62. A patient with suspected facet-mediated low back pain undergoes a diagnostic injection of a small volume of local anesthetic and contrast directly into the facet joint capsule itself, distinct from a medial branch block which targets the nerve supplying the joint rather than the joint itself. What is this procedure called?

- A.** Facet joint intra-articular injection, targeting the joint capsule directly rather than its nerve supply
- B.** Medial branch radiofrequency ablation, targeting the nerve supply for thermal lesioning
- C.** Epidural steroid injection, targeting the epidural space rather than the facet joint

63. During a vertebroplasty procedure, injected bone cement enters the vertebral venous plexus and travels through the venous system to the lungs, where it lodges in a pulmonary vessel, producing acute shortness of breath and chest pain shortly after the procedure. What complication does this represent?

- A.** Cement pulmonary embolism, from cement entering the venous system and embolizing to the pulmonary vasculature
- B.** Post-dural puncture headache, an unrelated complication from a different type of needle puncture

C. Local anesthetic systemic toxicity, from an unrelated medication overdose

64. A patient considering spinal cord stimulation is offered a choice between a paddle-type lead, which requires a small laminotomy for placement but offers more stable positioning and potentially better coverage, and a percutaneous lead, which can be placed through a needle without surgical laminotomy but may be more prone to migration. What does this comparison illustrate?

- A. Paddle leads and percutaneous leads are functionally and procedurally identical in every respect, with no meaningful tradeoffs
- B. Percutaneous leads always provide superior long-term outcomes compared to paddle leads in every patient
- C. Genuine tradeoffs exist: paddle leads trade more invasive placement for stability, while percutaneous leads trade less invasiveness for a migration risk

65. A patient with painful diabetic peripheral neuropathy refractory to pharmacologic management is referred for spinal cord stimulation, and the physician notes this represents a specific FDA-approved indication for SCS beyond its more traditional use for failed back surgery syndrome or CRPS. What does this illustrate about spinal cord stimulation's clinical applications?

- A. Spinal cord stimulation has only ever been approved for a single indication and cannot be used for any condition beyond failed back surgery syndrome
- B. Spinal cord stimulation's approved indications have expanded over time to include painful diabetic peripheral neuropathy, beyond its traditional use for failed back surgery syndrome or CRPS
- C. Painful diabetic peripheral neuropathy has never been studied as a potential indication for spinal cord stimulation

66. A patient with treatment-resistant depression and comorbid chronic pain undergoes a series of outpatient sessions in which a magnetic coil is placed against the scalp to deliver repeated magnetic pulses that induce electrical currents in targeted brain regions, without any needle, incision, or general anesthesia required. What is this non-invasive neuromodulation technique called?

- A. Spinal cord stimulation, an implanted device requiring a surgically placed epidural lead
- B. Repetitive transcranial magnetic stimulation, a non-invasive scalp-based technique using magnetic pulses
- C. Deep brain stimulation, an implanted device requiring stereotactic electrode placement

67. A patient with chronic myofascial pain undergoes a series of sessions in which fine needle electrodes are inserted percutaneously near a peripheral nerve and electrical current is delivered through the needles themselves, rather than through surface skin electrodes as with a more common device. What technique is this, and how does it differ from a common transcutaneous device?

- A.** Percutaneous electrical nerve stimulation, delivering current through inserted needle electrodes rather than surface pads
- B.** Standard TENS, which also uses needle electrodes inserted through the skin rather than surface pads
- C.** Spinal cord stimulation, requiring a permanently implanted epidural electrode array

68. A patient with moderate lumbar spinal stenosis and neurogenic claudication, who wants to avoid open decompression surgery, undergoes a minimally invasive procedure in which a small device is implanted between two adjacent spinous processes to maintain a flexed position and indirectly decompress the spinal canal. What is this device called?

- A.** A spinal cord stimulator paddle lead, an entirely different type of implanted device
- B.** An intrathecal drug delivery pump, an entirely different type of implanted device
- C.** An interspinous process spacer device, implanted to maintain spinal flexion and indirectly decompress the canal

69. A patient with lumbar spinal stenosis and neurogenic claudication undergoes a minimally invasive percutaneous procedure in which small pieces of thickened ligamentum flavum are removed through a small tubular instrument, without removing any bone, to indirectly decompress the spinal canal. What is this procedure called?

- A.** Open laminectomy, a more invasive surgical decompression involving removal of bone
- B.** Minimally invasive lumbar decompression (MILD procedure), removing ligamentum flavum tissue through a small percutaneous tubular instrument
- C.** Percutaneous discectomy, targeting disc material itself rather than the ligamentum flavum tissue

70. A patient with cervical radicular pain from a small contained disc herniation, refractory to conservative therapy, undergoes a minimally invasive percutaneous procedure in which a portion of nucleus pulposus material is removed or ablated through a small needle, decompressing the disc without open surgery. What is this procedure called?

A. Percutaneous cervical discectomy/nucleoplasty, decompressing a contained cervical disc herniation through a small needle

B. Cervical medial branch radiofrequency ablation, targeting facet joint innervation rather than the disc

C. Cervical epidural steroid injection, delivering medication into the epidural space rather than the disc

71. A patient with severe, refractory pain from chronic pancreatitis undergoes a radiofrequency or chemical neurolytic procedure targeting specific nerves that run along the anterolateral aspect of the vertebral bodies at the T11-T12 level, distinct from the celiac plexus itself, providing an alternative approach for pain of pancreatic origin. What structures are targeted?

A. The lumbar sympathetic chain, located at the L2 through L4 vertebral level

B. The stellate ganglion, located in the anterior cervical region

C. The splanchnic nerves, at the T11-T12 level, an alternative or adjunct target to the celiac plexus

72. A patient with chronic low back pain localized to the iliac crest region, radiating into the buttock but not below the knee, is found to have tenderness over small sensory nerves that cross the posterior iliac crest, and undergoes a diagnostic block targeting these specific nerves. Which nerves are targeted?

A. The superior cluneal nerves, crossing the posterior iliac crest to supply the upper buttock

B. The pudendal nerves, supplying sensation to the perineal region

C. The ilioinguinal nerves, supplying sensation to the groin region

73. A patient with buttock pain distinct from the distribution described for the superior cluneal nerves is found to have tenderness over a different set of sensory nerves crossing the posterior iliac crest at a more inferior and medial location near the sacroiliac joint. Which nerves are these?

A. The superior cluneal nerves, crossing more superiorly along the iliac crest

B. The middle cluneal nerves, crossing more inferiorly and medially near the posterior sacroiliac region

C. The inferior cluneal nerves, supplying the lower buttock and originating from the posterior femoral cutaneous nerve

74. Following a major abdominal surgery, a small catheter is left in place within the surgical wound, connected to a pump that continuously infuses local anesthetic directly into the incision site over several days, reducing postoperative pain and opioid requirements. What is this technique called?

- A.** An epidural catheter, placed in the epidural space rather than the surgical wound itself
- B.** A peripheral nerve catheter, placed near a specific named nerve rather than the wound itself
- C.** A continuous wound infiltration catheter, providing ongoing local anesthetic delivery directly into the surgical incision

75. A patient with suspected entrapment of a cutaneous nerve within scar tissue undergoes an ultrasound-guided injection of fluid (such as saline or local anesthetic) specifically intended to mechanically separate the nerve from the surrounding adherent scar tissue or fascia, rather than to provide an anti-inflammatory or neurolytic effect. What technique is this?

- A.** Hydrodissection, using injected fluid to mechanically free an entrapped nerve from adherent tissue
- B.** Chemical neurolysis, using phenol or alcohol to permanently destroy the nerve
- C.** Radiofrequency ablation, using thermal energy to lesion the nerve

76. A patient with carpal tunnel syndrome who wants to avoid open or endoscopic surgical release undergoes an ultrasound-guided procedure in which a specialized needle device is used to divide the transverse carpal ligament percutaneously, without an open surgical incision. What is this procedure called?

- A.** Standard open carpal tunnel release, requiring a formal surgical incision
- B.** Carpal tunnel corticosteroid injection, providing relief without dividing the ligament
- C.** Percutaneous carpal tunnel release, dividing the ligament through a needle-based approach without incision

77. A patient with chronic low back pain and significant identifiable myofascial trigger points and muscle spasm, refractory to other treatments, undergoes a series of injections of botulinum toxin into the affected paraspinal muscles, distinct from its use for migraine or piriformis syndrome. What is the rationale for this application?

- A.** Botulinum toxin has no plausible mechanism for treating muscle-related low back pain and is never used for this indication
- B.** Botulinum toxin's chemodenervation can reduce spasm and hyperactivity in paraspinal muscles, potentially relieving muscle-mediated back pain
- C.** Botulinum toxin is injected into the epidural space for this indication, rather than into the muscle itself

78. A patient with an implanted intrathecal drug delivery pump for chronic pain develops fever and redness overlying the subcutaneous pump reservoir, along with worsening pain control, and imaging raises concern for a break in the catheter connecting the pump to the intrathecal space. What two distinct complications does this scenario illustrate?

- A.** Cement pulmonary embolism and post-dural puncture headache, both unrelated to an implanted pump system
- B.** Opioid-induced hyperalgesia and constipation, both unrelated to a device complication
- C.** Pump pocket infection, suggested by fever and redness, and catheter fracture, suggested by imaging and worsening pain control

79. A patient undergoing hand surgery receives an ultrasound-guided regional block targeting the brachial plexus terminal branches surrounding the axillary artery in the axilla, chosen specifically because it avoids the risk of phrenic nerve involvement associated with a more proximal approach. Which block is this?

- A.** Interscalene brachial plexus block, performed at the level of the scalene muscles
- B.** Axillary brachial plexus block, targeting terminal branches around the axillary artery, avoiding phrenic involvement
- C.** Adductor canal block, targeting the thigh rather than the upper extremity

80. A patient undergoing forearm surgery receives an ultrasound-guided regional block targeting the brachial plexus cords as they travel beneath the clavicle and pectoralis minor muscle, providing reliable anesthesia to the forearm and hand at a level between the interscalene and axillary approaches. Which block is this?

- A.** Interscalene brachial plexus block, performed at the level of the scalene muscles proximally

B. Infraclavicular brachial plexus block, targeting the cords beneath the clavicle and pectoralis minor

C. Axillary brachial plexus block, targeting the terminal branches in the axilla distally

81. A patient with chronic pain and significant muscle tension is taught a structured technique in which they systematically tense and then release specific muscle groups throughout the body, one at a time, in a defined sequence, learning to recognize and release physical tension. What technique is this?

A. Diaphragmatic breathing, focused specifically on controlled abdominal breath work

B. Guided imagery, using structured, verbally guided mental visualization

C. Progressive muscle relaxation, systematically tensing and releasing muscle groups in sequence

82. A patient with chronic pain is taught a self-relaxation technique involving silently repeating standardized phrases (such as "my right arm is heavy and warm") while focusing attention on specific body sensations, aiming to induce a physiological relaxation response through self-suggestion rather than active muscle tensing. What technique is this?

A. Autogenic training, using self-suggestion phrases focused on body sensations to induce relaxation

B. Progressive muscle relaxation, involving active tensing and releasing of muscle groups

C. Cognitive restructuring, targeting distorted thought patterns rather than body sensations

83. A patient with chronic pain undergoes a series of sessions in which electrodes placed on the scalp measure their brainwave activity in real time, displayed on a screen, and the patient learns through trial and feedback to voluntarily shift their brainwave patterns toward a target pattern associated with reduced pain and improved relaxation. What technique is this?

A. Neurofeedback, using real-time EEG brainwave monitoring to train voluntary self-regulation

B. Standard biofeedback using surface electromyography of muscle tension

C. Transcutaneous electrical nerve stimulation, delivering electrical current through skin electrodes

84. A patient undergoing a painful wound dressing change is given a headset displaying an immersive, interactive computer-generated environment to engage their attention during the procedure, with studies

showing this can meaningfully reduce reported pain intensity during the procedure itself. What technique is this?

- A.** Standard guided imagery, using verbally guided mental visualization without any device
- B.** Clinical hypnosis, using a trained clinician's verbal suggestions to alter pain perception
- C.** Virtual reality distraction therapy, using an immersive headset-based environment to engage attention during a painful procedure

85. A patient with chronic pain asks about using essential oils, diffused into the air or applied topically, as a complementary approach to help with relaxation and pain-related anxiety. The physician explains that while pleasant for some patients, the evidence base for a direct analgesic effect remains limited. What therapy is being discussed?

- A.** Acupuncture, with a defined meridian-based theoretical framework
- B.** Aromatherapy, using essential oils with a limited evidence base for direct analgesic effect
- C.** Osteopathic manipulative treatment, a hands-on manual therapy system

86. A patient with chronic headaches is referred to a practitioner who uses very light touch to the skull and sacrum, claiming to detect and correct subtle rhythmic movements of the cerebrospinal fluid and cranial bones, a technique the physician notes has a proposed mechanism that lacks strong scientific support. What therapy is being described?

- A.** Osteopathic manipulative treatment, with an established biomedical rationale for soft tissue techniques
- B.** Dry needling, targeting myofascial trigger points with a defined neuromuscular rationale
- C.** Craniosacral therapy, using light touch with a proposed mechanism that lacks strong scientific support

87. A patient with chronic pain and habitual movement patterns undergoes sessions with a practitioner who guides them through slow, gentle, exploratory movements designed to increase awareness of habitual movement patterns and develop more efficient, less effortful ways of moving, rather than targeting strength or flexibility directly. What method is this?

- A.** Standard core stabilization exercise, targeting deep trunk muscle strength directly
- B.** Aquatic therapy, performed in a warm water pool environment

C. The Feldenkrais method, using slow exploratory movement to build more efficient movement patterns

88. A patient with chronic neck pain related to poor postural habits undergoes sessions with a practitioner who provides gentle hands-on guidance and verbal cues to help the patient recognize and release unnecessary muscular tension during everyday movements like sitting, standing, and walking, emphasizing postural re-education over exercise per se. What technique is this?

A. Standard physical therapy strengthening exercise, targeting specific muscle groups directly

B. The Alexander technique, using postural re-education to reduce unnecessary tension during movement

C. Trigger point dry needling, targeting myofascial taut bands directly

89. A patient with chronic low back pain begins a structured exercise program emphasizing core strength, controlled breathing, precise movement, and body alignment, performed on a specialized mat or using resistance equipment with springs, developed originally as a rehabilitation and conditioning system distinct from general strength training. What exercise method is this?

A. Pilates, an exercise method emphasizing core strength, controlled breathing, and precise movement

B. Standard aquatic therapy, performed in a pool environment

C. Tai chi, a slow-movement mind-body practice from Chinese martial arts tradition

90. A patient with chronic hip osteoarthritis is prescribed a structured walking program using poles held in each hand to engage the upper body and distribute load away from the lower extremities, distinct from standard unassisted walking. What is this exercise program called?

A. Nordic walking, using poles to engage the upper body and offload the lower extremities

B. Standard aquatic therapy, performed in a pool rather than on land

C. McKenzie method exercise, using directional preference movement testing

91. A patient with chronic pain and associated anxiety asks about a technique in which the patient taps with their fingertips on specific acupressure-like points on the face and body while verbally acknowledging the distressing feeling, claimed by proponents to reduce emotional distress. The

physician notes this technique lacks strong, rigorous supporting evidence. What technique is being described?

- A.** Clinical hypnosis, using a trained clinician's induced relaxed state and suggestion
- B.** Cognitive behavioral therapy, using structured cognitive and behavioral techniques
- C.** Emotional freedom technique (EFT tapping), using fingertip tapping on specific points with limited rigorous supporting evidence

92. A patient with chronic pain participates in a structured program in which they create visual artwork (drawing, painting, or sculpture) under the guidance of a trained therapist, using the creative process as a means of expressing and processing difficult emotions related to their pain experience, rather than to develop artistic skill. What therapy is this?

- A.** Music therapy, using structured musical engagement rather than visual art
- B.** Art therapy, using guided visual artistic expression to process emotions related to the pain experience
- C.** Guided imagery, using verbally guided mental visualization without any physical creative activity

93. A patient with chronic pain is asked to write for 15-20 minutes on several consecutive days about their deepest thoughts and feelings regarding a stressful or traumatic experience, a structured intervention studied for its potential benefit on both physical and psychological outcomes in chronic illness populations. What intervention is this?

- A.** Cognitive restructuring, targeting specific distorted thought patterns through therapist-guided dialogue
- B.** Expressive writing (journaling) intervention, structured writing about deep thoughts and feelings related to a stressful experience
- C.** Motivational interviewing, a patient-centered communication technique exploring ambivalence about behavior change

94. A therapist working with a patient with chronic pain and associated low mood focuses primarily on identifying the patient's existing strengths, exceptions to the problem (times when the pain was less distressing), and concrete, achievable goals for the near future, rather than extensively exploring the origins or history of the patient's difficulties. What therapeutic approach is this?

- A.** Solution-focused brief therapy, emphasizing strengths, exceptions, and concrete future goals over extensive exploration of problem history
- B.** Psychodynamic psychotherapy, extensively exploring unconscious conflicts and past experiences
- C.** Dialectical behavior therapy, focused specifically on distress tolerance and emotion regulation skills

95. A patient with chronic pain and clinically significant depression, whose depression appears closely tied to grief over role changes and strained relationships resulting from their pain condition, is referred for a time-limited psychotherapy specifically focused on improving interpersonal functioning and relationships as a pathway to improving mood. What therapy is this?

- A.** Cognitive behavioral therapy, focused primarily on restructuring distorted thoughts
- B.** Interpersonal therapy (IPT), a time-limited therapy focused on improving relationships and social functioning to address depression
- C.** Acceptance and commitment therapy, focused on psychological flexibility and values-based action

96. A pediatric pain program uses a structured system in which a child earns tokens or privileges for engaging in healthy coping behaviors (such as using relaxation strategies) and completing school attendance goals, with the rewards specifically structured to reinforce these target behaviors over time. What behavioral principle is being applied?

- A.** Contingency management, using structured rewards to reinforce specific target behaviors
- B.** Systematic desensitization, using graded exposure to reduce a specific fear response
- C.** Cognitive restructuring, targeting distorted thoughts rather than reinforcing behaviors directly

97. A physical therapist applies a specialized device that rubs ice directly over a localized area of acute muscle soreness for several minutes as an adjunct to other treatment, distinct from a static ice pack application, aiming for both a cooling and light massage effect. What technique is this?

- A.** Standard TENS application, using electrical stimulation rather than a cold modality
- B.** Diathermy, using deep heating through electromagnetic energy
- C.** Ice massage (cryotherapy with a massaging technique), combining a cooling effect with light mechanical massage

98. A physical therapist applies strips of elastic, adhesive tape in specific patterns over a patient's shoulder muscles, claiming the tape lifts the skin slightly to improve circulation and reduce pain, though rigorous evidence for a mechanism beyond a possible placebo or proprioceptive effect remains limited. What technique is this?

- A.** Standard rigid athletic taping, restricting joint range of motion for injury protection
- B.** Osteopathic manipulative treatment, using hands-on manual soft tissue techniques
- C.** Kinesiology taping, using elastic adhesive tape with a proposed but not rigorously established mechanism

99. A pain physician spends part of a visit explaining to a patient, using accessible language and diagrams, how pain signals are processed by the nervous system and how chronic pain can persist even after tissue has healed, with the specific goal of reducing the patient's fear and catastrophizing about their condition by improving their understanding of pain biology itself. What is this educational approach called?

- A.** Pain neuroscience education, explaining pain biology to reduce fear and catastrophizing and support engagement in active treatment
- B.** Standard informed consent discussion, focused specifically on procedural risks and benefits
- C.** Motivational interviewing, focused on exploring ambivalence about a specific behavior change

100. A patient with chronic pain and significant anxiety, living in a rural area far from mental health specialty care, receives structured cognitive behavioral therapy sessions with a psychologist conducted entirely through secure live video conferencing rather than in-person visits. What does this delivery model illustrate?

- A.** Telehealth-delivered psychotherapy can extend access to structured, evidence-based psychological treatment for chronic pain patients facing geographic or access barriers to in-person mental health care
- B.** Psychotherapy delivered via video conferencing has been shown to be entirely ineffective compared to in-person delivery in all circumstances
- C.** Telehealth psychotherapy delivery is restricted exclusively to supportive counseling and cannot include structured, evidence-based approaches like CBT

101. A patient with cancer pain who is otherwise well-controlled on a stable around-the-clock opioid regimen experiences a sudden, transient flare of severe pain that breaks through the baseline control, distinct from the patient's usual persistent background pain level. What is this type of pain called?

- A.** Nociplastic pain, arising from altered nociception without clear tissue damage
- B.** Chronic primary pain, a persistent pain condition in its own right
- C.** Breakthrough pain, a transient flare of pain that exceeds otherwise well-controlled baseline pain

102. A patient with longstanding chronic low back pain experiences a new, superimposed acute flare after lifting a heavy object, with pain now significantly worse than their usual baseline, prompting evaluation for a possible new acute injury layered on top of their preexisting chronic condition. What concept does this scenario illustrate?

- A.** Nociplastic pain, arising from altered central nociceptive processing without any tissue injury
- B.** Acute-on-chronic pain, a new acute pain process superimposed on a preexisting chronic pain condition
- C.** Breakthrough pain, a transient flare in an otherwise opioid-controlled baseline

103. A researcher describes the original 1990 American College of Rheumatology fibromyalgia diagnostic criteria, which required widespread pain plus tenderness on digital palpation at a specific number of designated anatomic tender point sites, a criteria set later revised in 2010 and again in 2016 to remove the physical tender point count requirement. What does this history illustrate?

- A.** Fibromyalgia diagnostic criteria have never changed since they were first established and remain identical to the original 1990 version
- B.** Fibromyalgia diagnostic criteria have evolved over time, moving away from a physical tender point count toward symptom-based criteria incorporating widespread pain index and symptom severity scores
- C.** The 2016 criteria reintroduced an even more extensive physical tender point examination requirement than the original 1990 version

104. A physician explains to a patient newly diagnosed with fibromyalgia that treatment typically emphasizes a multimodal approach including exercise, cognitive behavioral therapy, and specific non-opioid medications, while opioids are generally not recommended as a primary treatment strategy for

this condition. What is the rationale for this treatment approach, given fibromyalgia's underlying pathophysiology?

- A.** Fibromyalgia has no established pathophysiologic basis at all, making any specific treatment rationale impossible to formulate
- B.** Opioids are specifically the most effective treatment for fibromyalgia and should be used as first-line therapy in nearly all cases
- C.** Given fibromyalgia's basis in central sensitization/nociplastic mechanisms rather than ongoing tissue damage, opioids provide limited benefit and disproportionate risk, favoring a non-opioid approach

105. An emergency medical services crew treating a trauma patient with an obviously deformed, painful limb fracture at the scene administers intranasal fentanyl or intramuscular ketamine before transport, rather than waiting until hospital arrival to provide any analgesia. What does this practice reflect?

- A.** Prehospital analgesia is both feasible and appropriate for significant traumatic pain, improving comfort before hospital arrival
- B.** A now-abandoned outdated practice that current EMS protocols specifically prohibit under all circumstances
- C.** A practice reserved exclusively for pediatric trauma, never used in adult trauma care

106. A burn patient with background pain reasonably controlled by scheduled analgesics experiences a distinctly higher level of pain specifically during daily wound dressing changes, requiring additional, separately timed analgesic dosing administered shortly before each dressing change procedure. What does this illustrate about burn pain management?

- A.** Background burn pain and procedural dressing-change pain are identical in character and require no separate management approach
- B.** Only background burn pain requires analgesic management; procedural pain during dressing changes is expected to be tolerated without additional medication
- C.** Burn pain has distinct background and procedural components, and effective management requires separately timed analgesic dosing specifically to cover the more intense procedural pain of dressing changes

107. A child with a closed, displaced forearm fracture requiring reduction in the emergency department receives an injection of local anesthetic directly into the fracture site itself, into the accumulated blood clot around the fracture, providing analgesia for the reduction procedure without systemic sedation. What technique is this?

- A.** A standard peripheral nerve block, targeting a specific named nerve proximal to the fracture
- B.** A hematoma block, injecting local anesthetic directly into the fracture hematoma itself
- C.** Procedural sedation with intravenous ketamine, providing systemic dissociative anesthesia

108. A young child needs an MRI to evaluate a musculoskeletal injury, but the physician is concerned the child will be unable to remain still and calm for the duration of the scan in the enclosed scanner environment. The child is given a sedative medication specifically to ensure motion-free imaging and reduce distress from the enclosed space, distinct from sedation given for a painful procedure itself. What is the primary purpose of this sedation?

- A.** To provide analgesia for an inherently painful imaging procedure, since MRI itself causes significant physical pain
- B.** To ensure the child remains motionless for adequate image quality and to reduce distress from the enclosed scanner environment, rather than to treat procedural pain
- C.** To permanently alter the child's underlying anxiety disorder through a single sedation session

109. A postoperative care team implements a multimodal approach specifically targeting postoperative nausea and vomiting, including risk stratification, prophylactic antiemetic medication, and minimizing opioid use where possible (since opioids themselves contribute to nausea), recognizing that unmanaged nausea can itself worsen a patient's overall postoperative experience and complicate pain assessment. What does this approach illustrate?

- A.** Postoperative nausea has no relationship whatsoever to opioid use or overall recovery
- B.** Antiemetic prophylaxis is never indicated before surgery and should only follow established nausea
- C.** PONV management is an important part of recovery, with opioid-sparing analgesia serving a dual role in pain and nausea reduction

110. A patient undergoing a peripheral nerve block for surgical anesthesia has an incomplete or "patchy" block that fails to provide adequate anesthesia in one portion of the surgical field, and the anesthesia

team must decide between supplementing with local infiltration, adding systemic analgesia, or converting to general anesthesia. What does this scenario illustrate about regional anesthesia?

- A.** Peripheral nerve blocks can occasionally fail partially or completely, and anesthesia teams must have a rescue analgesia plan ready to manage this recognized possibility
- B.** Peripheral nerve blocks never fail once properly performed under ultrasound guidance, making rescue planning entirely unnecessary
- C.** A patchy or incomplete block always requires immediate conversion to general anesthesia, with no other rescue options available

111. A woman in active labor requests analgesia and receives a catheter placed into the epidural space, through which local anesthetic and often an opioid are continuously infused, providing effective pain relief for labor while generally preserving the ability to push during delivery. What is this technique called?

- A.** A spinal (intrathecal) block, providing a single-injection anesthetic typically used for surgical delivery
- B.** A pudendal nerve block, targeting perineal sensation only, for late second-stage labor pain
- C.** Labor epidural analgesia, providing continuous pain relief throughout labor via a catheter in the epidural space

112. A postoperative care team implements a multimodal, opioid-sparing analgesic protocol for elderly surgical patients, noting that this approach may help reduce the incidence of postoperative delirium compared to a regimen relying more heavily on opioid medications alone. What is the proposed rationale for this relationship?

- A.** Higher opioid doses can contribute to postoperative delirium risk in vulnerable elderly patients, so multimodal analgesia may reduce this risk
- B.** Opioids have no recognized relationship whatsoever to postoperative delirium risk in any patient population
- C.** Opioid-sparing analgesia in elderly patients is used exclusively for cost reasons, with no link to delirium

113. A patient undergoing extraction of an impacted wisdom tooth receives a combination of local anesthetic nerve block injections in the mouth along with a scheduled regimen of NSAIDs and

acetaminophen for postoperative pain, with opioids reserved only if this regimen proves inadequate. What does this approach reflect?

- A.** Dental and oral surgical pain cannot be managed with local anesthesia and always requires general anesthesia
- B.** NSAIDs and acetaminophen have no meaningful role in managing pain after dental or oral surgical procedures
- C.** A multimodal, opioid-sparing approach combining local anesthesia with scheduled non-opioid analgesics is often sufficient, reserving opioids for inadequate response

114. A patient presents with a painful but superficial sunburn covering a large area of the back, without blistering, and is advised to use cool compresses, topical aloe vera, and over-the-counter oral NSAIDs for pain and inflammation, without need for prescription-strength analgesics or wound care referral. What does this management approach reflect?

- A.** All burns, regardless of depth or severity, require the same intensive multimodal analgesic and wound care approach used for major burns
- B.** Superficial sunburn without blistering is generally a self-limited, minor injury manageable with simple measures like cooling, topical care, and over-the-counter analgesics
- C.** Sunburn pain can only be effectively managed with prescription-strength opioid analgesics, regardless of burn depth or extent

115. A pediatric phlebotomist preparing to draw blood from an anxious young child uses age-appropriate distraction techniques such as blowing bubbles, watching a video, or engaging in guided imagery during the needle stick, rather than relying solely on pharmacologic sedation for this minor procedure. What does this approach illustrate?

- A.** Non-pharmacologic distraction techniques can be an effective, appropriate first-line approach for managing procedural anxiety and pain perception during minor pediatric procedures
- B.** Distraction techniques have no evidence supporting any benefit for reducing pediatric procedural pain or anxiety perception
- C.** Every pediatric procedure, regardless of how minor, requires pharmacologic sedation and cannot be managed with behavioral techniques alone

116. A patient recovering from thoracic surgery with inadequately controlled incisional pain is found to be taking shallow breaths and avoiding coughing or using their incentive spirometer, raising concern for downstream pulmonary complications like atelectasis or pneumonia. What does this scenario illustrate about the relationship between postoperative pain control and pulmonary outcomes?

- A.** Postoperative pain control has no meaningful relationship to a patient's ability to perform pulmonary toilet or use an incentive spirometer effectively
- B.** Inadequately controlled thoracic surgical pain can directly impair a patient's ability to breathe deeply, cough, and use an incentive spirometer, increasing the risk of pulmonary complications like atelectasis
- C.** Incentive spirometry is only relevant for patients undergoing abdominal surgery and has no application after thoracic surgery

117. A patient with a known history of chronic pancreatitis presents to the emergency department with a severe acute flare of epigastric pain radiating to the back, and the care team implements a multimodal analgesic approach including IV opioids, considers nerve block referral if the flare does not resolve, and evaluates for a superimposed acute complication such as a pseudocyst or duct obstruction. What does this scenario illustrate?

- A.** An acute pain flare in a patient with an underlying chronic pain condition warrants both symptomatic multimodal pain management and evaluation for a new, superimposed acute complication
- B.** Chronic pancreatitis pain flares should never be treated with any opioid medication under any circumstances, regardless of severity
- C.** Acute flares of chronic pancreatitis pain never warrant any additional diagnostic workup beyond simply increasing the patient's baseline analgesic dose

118. A weightlifter feels a sudden, sharp pain above the kneecap while forcefully extending the knee against resistance, followed by inability to actively extend the knee and a palpable gap just above the patella. What condition does this represent?

- A.** Quadriceps tendon rupture, producing a suprapatellar gap and loss of active knee extension
- B.** Patellar tendinopathy, a chronic degenerative overuse condition rather than a sudden traumatic rupture
- C.** Pes anserine bursitis, producing medial knee tenderness rather than a suprapatellar defect

119. A middle-aged patient reports an episode of acute, severe shoulder pain of sudden onset, with imaging revealing a discrete deposit of calcium within the supraspinatus tendon, distinct from the gradual degenerative pattern typical of chronic tendinopathy. What condition does this represent?

- A.** Adhesive capsulitis, with gradual, progressive global motion restriction
- B.** Calcific tendinitis, an acute inflammatory reaction to a calcium deposit within the rotator cuff tendon
- C.** A SLAP lesion, involving the superior labrum rather than the tendon itself

120. A middle-aged patient lifting a heavy object feels a sudden pop in the front of the shoulder, followed by bruising and a visible bulge in the mid-upper arm (a "Popeye" deformity), with weakness in forearm supination. What does this represent?

- A.** Biceps tendon rupture, producing a characteristic "Popeye" deformity from proximal muscle belly retraction
- B.** Biceps tendinopathy, a chronic degenerative overuse condition without acute rupture
- C.** Adhesive capsulitis, with global shoulder motion restriction rather than an acute rupture

121. A patient reports a soft, fluctuant, non-tender to mildly tender swelling directly over the tip of the elbow, without significant pain with elbow flexion/extension or notable functional limitation. What condition does this most likely represent?

- A.** Lateral epicondylitis, with pain localized to the outer elbow rather than the tip
- B.** Olecranon bursitis, a fluid collection within the bursa overlying the olecranon process
- C.** Cubital tunnel syndrome, with ulnar nerve-distribution numbness rather than swelling

122. A competitive baseball pitcher reports medial elbow pain that worsens specifically during the late cocking and acceleration phases of throwing, with medial elbow instability demonstrated on valgus stress testing. What structure is most likely injured?

- A.** The lateral collateral ligament, an uncommon site of throwing-related injury
- B.** The common extensor tendon origin, associated with lateral rather than medial elbow pain
- C.** The ulnar collateral ligament, commonly injured in overhead throwing athletes from repetitive valgus stress

123. A basketball player with a history of repeated ankle sprains reports that the ankle now "gives way" unpredictably during ordinary walking on level ground, with exam showing excessive inversion laxity and reduced proprioceptive balance on single-leg stance testing, well after the original injury has healed. What condition does this represent?

- A.** An acute lateral ankle sprain, an isolated new injury rather than a longstanding functional problem
- B.** Chronic ankle instability, from residual ligamentous laxity and impaired proprioception after repeated sprains
- C.** Achilles tendon rupture, producing plantarflexion weakness rather than a giving-way sensation with inversion

124. A patient with longstanding rheumatoid arthritis of the hand develops a finger deformity in which the middle joint (PIP joint) is fixed in flexion while the fingertip joint (DIP joint) is hyperextended, from disruption of the central slip of the extensor tendon. What deformity is this?

- A.** Trigger finger, from a flexor tendon nodule causing catching and locking rather than a fixed extensor deformity
- B.** Dupuytren's contracture, from palmar fascia thickening rather than extensor tendon disruption
- C.** Boutonniere deformity, from central slip extensor tendon disruption causing PIP flexion with DIP hyperextension

125. A patient falls onto an outstretched hand and develops pain and swelling localized to the anatomic snuffbox at the base of the thumb, with a normal initial X-ray but persistent clinical suspicion prompting immobilization and repeat imaging. What injury is most concerning in this presentation?

- A.** Scaphoid fracture, which can be radiographically occult initially, with anatomic snuffbox tenderness as a key clinical clue
- B.** Distal radius fracture, typically visible on initial X-ray without diagnostic uncertainty
- C.** De Quervain tenosynovitis, a tendon condition rather than a fracture

126. An elderly patient falls onto an outstretched hand and develops immediate wrist pain, swelling, and a visible "dinner fork" deformity, with X-ray confirming a fracture of the distal radius with dorsal displacement. What is this classic fracture pattern called?

- A.** A Colles' fracture, a distal radius fracture with dorsal angulation producing the classic "dinner fork" deformity
- B.** A scaphoid fracture, typically without a visible gross deformity on inspection
- C.** A boxer's fracture, involving the fifth metacarpal neck rather than the distal radius

127. A soccer player forcefully hyperextends the great toe while planting the foot to kick, resulting in immediate pain and swelling at the base of the toe, with exam confirming a sprain of the first metatarsophalangeal joint's plantar capsule and ligaments. What is this injury commonly called?

- A.** Hallux valgus, a chronic progressive deformity rather than an acute traumatic sprain
- B.** Turf toe, an acute sprain of the first metatarsophalangeal joint from forced hyperextension
- C.** Morton's neuroma, an interdigital nerve condition rather than a joint ligament sprain

128. A young athlete reports groin and anterior hip pain worsened by hip flexion activities such as deep squatting, with imaging showing abnormal contact between the femoral head-neck junction and the acetabular rim during hip flexion, a structural abnormality thought to predispose to labral tears and early osteoarthritis. What condition does this represent?

- A.** Osteitis pubis, involving the pubic symphysis rather than the femoral head-neck junction
- B.** Meralgia paresthetica, a nerve entrapment rather than a bony structural abnormality
- C.** Femoroacetabular impingement, abnormal femoral head-neck/acetabular contact predisposing to labral injury

129. A soccer player reports chronic, activity-related pain localized directly to the pubic symphysis, worsened by kicking and cutting movements, with imaging showing inflammatory changes at the symphysis itself, distinct from a muscular groin strain. What condition does this represent?

- A.** Femoroacetabular impingement, involving the hip joint rather than the pubic symphysis
- B.** Hip labral tear, involving the acetabular labrum rather than the pubic symphysis
- C.** Osteitis pubis, an inflammatory overuse condition localized to the pubic symphysis

130. A hockey player reports chronic lower abdominal and groin pain worsened by sit-ups, coughing, and sudden movements, without a palpable hernia on exam, ultimately diagnosed with a tear or

weakness in the lower abdominal wall musculature/tendon complex near its insertion on the pubis. What condition does this represent?

- A.** Sports hernia (athletic pubalgia), a tear or weakness of the lower abdominal wall musculature/tendon complex without a palpable true hernia
- B.** Osteitis pubis, an inflammatory bone-level condition rather than a soft tissue muscular/tendon injury
- C.** A standard inguinal hernia, with a palpable bulge and defect on physical examination

131. A patient with knee osteoarthritis reports pain and tenderness localized to the medial knee, approximately two to three inches below the joint line, at the site where the sartorius, gracilis, and semitendinosus tendons insert, distinct from joint-line tenderness itself. What condition does this represent?

- A.** Medial collateral ligament sprain, with tenderness directly at the joint line
- B.** Pes anserine bursitis, with tenderness at the conjoined tendon insertion below the medial joint line
- C.** Baker's cyst, with posterior rather than medial knee swelling

132. A skier falls and twists their knee, applying a valgus (inward) stress, and develops immediate medial knee pain and mild laxity on valgus stress testing, without a positive Lachman test. What structure is most likely injured?

- A.** The anterior cruciate ligament, assessed with the Lachman test, which is explicitly negative in this vignette
- B.** The medial collateral ligament (MCL), injured by valgus stress and assessed with valgus stress testing
- C.** The lateral meniscus, assessed with the McMurray test rather than valgus stress testing

133. A jumping athlete (such as a volleyball or basketball player) reports pain localized specifically to the inferior pole of the patella, worsened by jumping and landing activities, with imaging showing degenerative changes within the patellar tendon itself at its origin. What condition does this represent?

- A.** Patellar tendinopathy ("jumper's knee"), degenerative changes at the patellar tendon origin from repetitive jumping loads

- B.** Patellofemoral pain syndrome, with diffuse anterior knee pain from abnormal patellar tracking rather than a focal tendon lesion
- C.** Iliotibial band syndrome, with lateral rather than inferior patellar pain

134. A young baseball pitcher reports gradually worsening shoulder pain with throwing, and imaging reveals widening of the proximal humeral growth plate without an acute fracture, attributed to repetitive rotational stress on the still-open epiphysis during the throwing motion. What condition does this represent?

- A.** SLAP lesion, a labral tear typically seen in skeletally mature throwing athletes rather than an open growth plate injury
- B.** Adhesive capsulitis, a global capsular motion restriction rather than a growth plate stress injury
- C.** Little league shoulder (proximal humeral epiphysiolysis), a repetitive throwing-related stress injury to the open proximal humeral growth plate

135. A young, active child reports heel pain, worse with running and jumping sports, with tenderness on compression of the sides of the heel, occurring during a growth spurt, without any history of significant trauma. What condition does this represent?

- A.** Plantar fasciitis, typically presenting in adults with first-step morning pain rather than in a growing child
- B.** Achilles tendon rupture, an acute traumatic injury rather than a gradual overuse condition
- C.** Sever's disease (calcaneal apophysitis), a traction-related growth plate irritation at the heel in growing children

136. A basketball player lands awkwardly on another player's foot, causing their ankle to roll inward (inversion), resulting in immediate lateral ankle pain, swelling, and difficulty bearing weight, with tenderness over the anterior talofibular ligament. What condition does this represent?

- A.** Posterior tibial tendon dysfunction, a chronic overuse condition rather than an acute inversion injury
- B.** Lateral ankle sprain, from an inversion mechanism injuring the lateral ligament complex including the anterior talofibular ligament
- C.** Achilles tendon rupture, involving the posterior rather than lateral ankle structures

137. A middle-aged recreational athlete feels a sudden, sharp pain in the back of the ankle during a game, as if "kicked" from behind, followed by difficulty walking and weakness with plantarflexion, with a palpable gap noted on exam just above the heel. What condition does this represent?

- A.** Achilles tendon rupture, producing a sudden "kicked" sensation, plantarflexion weakness, and a palpable tendon gap
- B.** Achilles tendinopathy, a chronic degenerative condition without an acute rupture or palpable gap
- C.** Sever's disease, a pediatric condition rather than an adult acute tendon injury

138. A middle-aged patient with obesity reports gradual, progressive flattening of the medial arch of the foot along with medial ankle pain and swelling along the course of a specific tendon, ultimately affecting the ability to perform a single-leg heel raise. What condition does this represent?

- A.** Lateral ankle sprain, from an acute inversion injury rather than a gradual process
- B.** Plantar fasciitis, with heel pain rather than medial ankle pain and arch collapse
- C.** Posterior tibial tendon dysfunction, a degenerative condition causing flatfoot and impaired heel raise

139. A young athlete involved in a sport requiring repetitive spinal extension (such as gymnastics) reports activity-related low back pain, and imaging reveals a stress fracture of the pars interarticularis without any associated forward slippage of one vertebral body on another. What condition does this represent, and how does it differ from a related, more advanced condition?

- A.** Spondylolisthesis, which specifically requires vertebral slippage to be present
- B.** Facet joint arthropathy, a degenerative rather than stress-fracture-related condition
- C.** Spondylolysis, a pars stress fracture without slippage that can progress to spondylolisthesis

140. An adolescent reports a gradually worsening rounded upper back deformity along with mild back pain, and imaging shows wedging of several consecutive thoracic vertebral bodies, a structural (rather than purely postural) form of kyphosis. What condition does this represent?

- A.** Scheuermann's kyphosis, a structural adolescent kyphosis with characteristic vertebral body wedging
- B.** Adult degenerative (de novo) scoliosis, a lateral curvature condition of older adults rather than kyphosis in an adolescent

C. Ankylosing spondylitis, an inflammatory spondyloarthropathy rather than a structural growth-related kyphosis

141. A patient reports sharp, intermittent pain at the lower costal margin, sometimes with a clicking or slipping sensation, reproduced by the examiner hooking their fingers under the affected rib and pulling anteriorly. What condition does this represent?

A. Costochondritis, with tenderness at the costochondral junction rather than a hooking/slipping maneuver finding

B. Slipping rib syndrome, from hypermobility of the lower rib cartilage attachments producing a clicking or slipping sensation with a positive hooking maneuver

C. Osteitis pubis, an unrelated condition involving the pubic symphysis rather than the ribs

142. A child between ages 4 and 8 develops a limp and hip/groin pain, with imaging showing flattening and fragmentation of the femoral head epiphysis from interrupted blood supply, without a history of corticosteroid use or other identifiable risk factor typically seen in adults with a similar condition. What condition does this represent?

A. Femoroacetabular impingement, a structural contact abnormality rather than a blood-supply-related process

B. Slipped capital femoral epiphysis, involving epiphyseal displacement rather than fragmentation from interrupted blood supply

C. Legg-Calve-Perthes disease, idiopathic avascular necrosis of the femoral head epiphysis in young children

143. A patient with metastatic colorectal cancer develops progressive groin and anterior thigh pain along with weakness in hip flexion, and imaging reveals tumor involvement of the psoas muscle compressing the femoral nerve as it travels within the muscle. What condition does this represent?

A. Malignant brachial plexopathy, involving the upper rather than lower extremity nerve plexus

B. Postmastectomy pain syndrome, an unrelated chronic pain syndrome following breast surgery

C. Malignant psoas syndrome, from tumor infiltration of the psoas muscle compressing the femoral nerve

144. A patient with multiple myeloma reports diffuse, severe bone pain, particularly in the spine, ribs, and pelvis, with imaging showing characteristic "punched-out" lytic lesions throughout the skeleton. What underlying mechanism contributes to this diffuse bony pain pattern?

- A.** Diffuse osteoclast activation by myeloma cells, producing widespread lytic bone destruction and associated pain throughout the involved skeleton
- B.** A single, isolated bone metastasis from a solid tumor, producing focal rather than diffuse pain
- C.** Osteitis pubis, a localized pubic symphysis condition rather than a diffuse skeletal process

145. A patient with a large, rapidly proliferating lymphoma begins chemotherapy and within 24-48 hours develops severe flank and abdominal pain along with laboratory abnormalities including hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia, related to massive tumor cell breakdown. What oncologic emergency does this represent?

- A.** Tumor lysis syndrome, from massive tumor cell breakdown releasing intracellular contents, producing characteristic metabolic derangements and pain
- B.** Hypercalcemia of malignancy, which would produce hypercalcemia rather than the hypocalcemia described in this vignette
- C.** Superior vena cava syndrome, an unrelated vascular compression syndrome rather than a metabolic emergency

146. A patient with active metastatic cancer develops sudden-onset unilateral leg swelling and calf pain, with imaging confirming a deep vein thrombosis, recognized as a common and clinically significant complication in this population given the prothrombotic state associated with malignancy. What does this scenario illustrate?

- A.** Cancer has no recognized association with increased venous thromboembolism risk compared to the general population
- B.** Malignancy is associated with an increased risk of venous thromboembolism, including deep vein thrombosis, related to a cancer-associated prothrombotic state
- C.** Deep vein thrombosis in a cancer patient is always caused by direct tumor invasion of the vein itself, never by a systemic prothrombotic state

147. A patient receiving a vesicant chemotherapy agent through a peripheral IV notices the infusion site is becoming increasingly painful, swollen, and red during administration, and the infusion is

immediately stopped due to concern that the medication is leaking outside the vein into surrounding tissue. What complication does this represent, and why is prompt recognition important?

- A.** A typical, expected finding with any IV chemotherapy infusion, requiring no specific action or concern
- B.** Chemotherapy extravasation, in which a vesicant agent leaks into surrounding tissue, potentially causing significant local tissue damage if not promptly recognized and managed
- C.** An unrelated allergic reaction to the chemotherapy agent, requiring systemic epinephrine rather than local wound management

148. A patient undergoing radiation therapy for breast cancer develops painful, red, peeling skin within the treatment field several weeks into therapy, distinct from any wound or infection, attributed directly to the cumulative effect of ionizing radiation on the skin. What condition does this represent?

- A.** Chemotherapy-induced oral mucositis, involving the oral cavity rather than the skin
- B.** Cellulitis, an infectious skin process rather than a radiation-related effect
- C.** Radiation dermatitis, a painful skin reaction from cumulative radiation exposure within the treatment field

149. A patient with locally advanced cervical cancer develops progressive flank pain and is found on imaging to have hydronephrosis from tumor compression of the ureter, with pain related to the resulting obstruction and back-pressure on the kidney. What does this scenario illustrate about cancer pain?

- A.** Cancer-related pain always arises directly from the primary tumor mass itself, never from a secondary effect like obstruction of an adjacent structure
- B.** Cancer can produce pain through secondary mechanical effects on adjacent structures, such as ureteral obstruction from local tumor compression, distinct from pain directly at the primary tumor site
- C.** Ureteral obstruction from a pelvic malignancy has no recognized association with flank or back pain

150. A patient with liver metastases from colorectal cancer reports a deep, aching right upper quadrant pain that worsens with the tumor's growth, attributed to stretching of the fibrous capsule surrounding the liver as the organ enlarges with metastatic burden, distinct from pain arising from the metastatic lesions' direct tissue invasion elsewhere. What does this illustrate?

- A.** Liver metastases never cause any pain regardless of size or growth rate
- B.** Hepatic capsule distension from liver enlargement is a recognized cancer pain mechanism, distinct from direct tumor invasion
- C.** All abdominal cancer pain arises exclusively from direct peritoneal invasion, never from organ capsule stretching

151. A young adult who was successfully treated for childhood leukemia many years ago now reports chronic joint and bone pain, which the survivorship clinic attributes to lasting effects of the chemotherapy and radiation received during treatment decades earlier, despite no evidence of disease recurrence. What does this illustrate about long-term cancer survivorship?

- A.** Childhood cancer survivors can experience persistent chronic pain related to lasting treatment effects many years after successful treatment, representing an ongoing survivorship care consideration
- B.** Chronic pain in childhood cancer survivors always indicates disease recurrence and should never be attributed to prior treatment effects
- C.** Childhood cancer treatments have no recognized long-term musculoskeletal effects that could persist into adulthood

152. A patient with advanced, locally invasive breast cancer has a fungating tumor wound on the chest wall that is both painful and associated with significant odor, and the palliative care team addresses both the pain and the odor as part of comprehensive wound care, recognizing that both symptoms significantly affect the patient's quality of life and dignity. What does this illustrate about fungating malignant wound management?

- A.** Comprehensive management of a fungating wound addresses both pain control and odor together, as key contributors to comfort and dignity
- B.** Fungating malignant wounds are never painful and require attention only to odor, never to any pain component whatsoever
- C.** Odor management for a fungating wound has no relationship whatsoever to a patient's quality of life or personal dignity

153. A critically ill patient with metastatic cancer in the ICU, sedated and mechanically ventilated, cannot self-report pain, and the ICU team uses a validated behavioral pain assessment tool designed for

critically ill, nonverbal patients, adapted to this patient's oncologic context, to guide analgesic titration. What does this scenario illustrate about pain assessment in critically ill cancer patients?

- A.** Pain assessment is impossible in sedated, mechanically ventilated ICU patients and should not be attempted
- B.** Validated behavioral pain assessment tools designed for critically ill, nonverbal patients can be applied to guide analgesic management in critically ill cancer patients who cannot self-report
- C.** Critically ill cancer patients require an entirely different, cancer-specific pain assessment methodology that has no overlap with standard ICU pain assessment tools

154. A patient with metastatic breast cancer to the spine has localized vertebral pain from a metastatic lesion, but imaging and neurologic exam confirm no evidence of spinal cord or nerve root compression, allowing for a less urgent, symptom-focused management approach rather than emergent intervention. What does this scenario illustrate?

- A.** Not all spinal metastases produce cord compression; localized vertebral pain without neurologic compromise can be managed with a less urgent, pain-focused approach distinct from the emergent management required for true cord compression
- B.** Any spinal metastasis, regardless of neurologic exam findings, always requires emergent MRI and high-dose corticosteroids as though cord compression were present
- C.** Spinal metastases without cord compression on initial imaging can never subsequently progress to cause cord compression, so no further monitoring is needed

155. An elderly patient with known atherosclerotic disease reports dull, crampy abdominal pain that reliably begins 20-30 minutes after eating and gradually resolves over the following hour or two, leading to a fear of eating and unintentional weight loss. What condition does this presentation suggest?

- A.** Acute mesenteric ischemia, a sudden-onset surgical emergency rather than a chronic, reproducible postprandial pattern
- B.** Chronic mesenteric ischemia ("intestinal angina"), from inadequate blood flow to meet the increased metabolic demand of digestion after eating
- C.** Functional dyspepsia, without an underlying vascular mechanism

156. An adolescent male develops sudden, severe unilateral scrotal pain along with nausea and vomiting, with exam showing a high-riding, horizontally oriented testicle and an absent cremasteric

reflex, representing a true surgical emergency requiring immediate evaluation. What condition does this represent?

- A.** Testicular torsion, a surgical emergency requiring immediate detorsion to preserve testicular viability
- B.** Epididymitis, a more gradual-onset infectious/inflammatory condition rather than a sudden vascular emergency
- C.** Chronic prostatitis/chronic pelvic pain syndrome, a chronic rather than acute presentation

157. A sexually active young man develops gradual-onset scrotal pain and swelling over one to two days, along with dysuria and a low-grade fever, with exam showing tenderness posterior to the testicle and relief of pain with scrotal elevation (a positive Prehn sign). What condition does this represent?

- A.** Epididymitis, an infectious/inflammatory condition with gradual onset, dysuria, and pain relief with scrotal elevation
- B.** Testicular torsion, a sudden-onset vascular emergency without the gradual onset or infectious symptoms described here
- C.** Testicular cancer, typically presenting as a painless mass rather than an acute painful, febrile illness

158. An older adult reports several days of left lower quadrant abdominal pain, low-grade fever, and a change in bowel habits, with CT imaging showing inflammation of an outpouching of the colonic wall in the sigmoid colon. What condition does this represent?

- A.** Appendicitis, which classically presents with right lower quadrant, not left lower quadrant, pain
- B.** Biliary colic, with right upper quadrant pain rather than left lower quadrant pain
- C.** Diverticulitis, from inflammation of a colonic diverticulum, classically presenting with left lower quadrant pain in the sigmoid colon

159. A patient reports episodic, severe, squeezing substernal chest pain that can mimic cardiac chest pain, sometimes triggered by swallowing very hot or cold liquids, with cardiac workup negative and esophageal manometry showing simultaneous, high-amplitude, uncoordinated esophageal contractions. What condition does this represent?

- A.** Esophageal spasm, producing severe substernal chest pain from uncoordinated esophageal contractions, capable of mimicking cardiac pain
- B.** Gastroesophageal reflux disease, typically producing a burning sensation rather than a squeezing chest pain pattern with manometric spasm
- C.** Peptic ulcer disease, producing epigastric pain related to meals rather than substernal chest pain triggered by swallowing

160. A woman in her reproductive years reports brief, recurring episodes of unilateral lower abdominal pain occurring consistently around the middle of her menstrual cycle, lasting a few hours to a day, without fever or other concerning findings, attributed to minor peritoneal irritation from the release of an egg. What condition does this represent?

- A.** Ovarian torsion, a surgical emergency rather than a brief, benign, cyclical pain pattern
- B.** Endometriosis, a chronic condition rather than a brief, mid-cycle, self-limited pain episode
- C.** Mittelschmerz, brief mid-cycle unilateral pelvic pain from minor peritoneal irritation associated with ovulation

161. A patient with a history of severe, forceful vomiting develops sudden, severe chest and upper abdominal pain, along with subcutaneous crepitus in the neck, and imaging confirms a full-thickness tear of the esophagus with leakage of contents into the mediastinum. What condition does this represent?

- A.** Esophageal spasm, a motor disorder without any structural tear or perforation
- B.** Peptic ulcer disease, involving the stomach or duodenum rather than a full-thickness esophageal tear
- C.** Boerhaave syndrome, a full-thickness esophageal rupture typically following forceful vomiting, representing a surgical emergency

162. A patient with longstanding constipation, infrequent bowel movements, and straining reports chronic, crampy lower abdominal pain that improves somewhat after a bowel movement, without alarm features such as weight loss or blood in the stool, attributed to colonic distension from retained stool. What does this scenario illustrate about visceral pain?

- A.** Chronic constipation can itself produce visceral abdominal pain through colonic distension, a benign but significant pain source

- B.** Constipation has no recognized relationship to abdominal pain of any kind
- C.** Constipation-related pain always indicates malignancy and needs the same urgent workup as alarm-feature pain

163. A patient reports frequent, very brief (seconds to a few minutes) attacks of severe unilateral periorbital pain, occurring dozens of times per day, associated with prominent ipsilateral conjunctival injection and tearing, and notably showing no significant response to indomethacin, distinguishing it from other short-lasting headache syndromes. What condition does this represent?

- A.** Paroxysmal hemicrania, which is characteristically completely responsive to indomethacin
- B.** Cluster headache, with typically longer attack duration than described here
- C.** SUNCT syndrome, brief attacks with conjunctival injection and tearing, notably not indomethacin-responsive

164. A patient reports a daily headache that began abruptly on a specific, clearly remembered day and has persisted without significant remission ever since, now present continuously for over three months, without a clear preceding acute illness or head trauma to explain the onset. What condition does this represent?

- A.** Chronic migraine, which typically evolves gradually from episodic migraine rather than beginning abruptly on a single remembered day
- B.** New daily persistent headache (NDPH), a distinct headache syndrome with an abrupt, clearly remembered onset that becomes continuous and unremitting
- C.** Medication overuse headache, related specifically to frequent analgesic use rather than a de novo abrupt onset

165. A patient develops persistent daily headaches beginning within a week after a mild traumatic brain injury (concussion) from a car accident, with the headache pattern resembling a mix of tension-type and migrainous features, persisting for several months after the injury. What condition does this represent?

- A.** Idiopathic intracranial hypertension, an unrelated condition without a preceding head trauma history
- B.** Post-traumatic headache, attributed to head trauma, developing in the recognized window and sometimes persisting chronically

C. Cluster headache, a primary headache disorder unrelated to any preceding trauma

166. A patient reports brief, sharp, stabbing pains lasting only a second or two, occurring irregularly and unpredictably in different locations on the scalp or head, without any associated autonomic features, occurring in a patient with no other significant headache history. What condition does this represent?

A. Trigeminal neuralgia, with pain confined to a specific trigeminal nerve division rather than migrating irregularly

B. Cluster headache, with longer attack duration and prominent autonomic features

C. Primary stabbing headache ("ice pick" headache), brief, sharp, irregularly occurring stabbing pains without autonomic features

167. A patient reports a severe, throbbing headache that occurs specifically and reproducibly during or shortly after vigorous physical exertion, such as weightlifting or running, with the headache resolving within minutes to a few hours after stopping the activity, and a normal neurologic workup excluding a secondary cause. What condition does this represent?

A. Cervicogenic headache, related to neck pathology rather than specifically to exertion

B. Medication overuse headache, related to analgesic use rather than physical exertion

C. Primary exertional headache, a headache reproducibly triggered by physical exertion, diagnosed after excluding a secondary cause

168. A patient reports brief, severe, electric shock-like pain triggered by swallowing, chewing, or talking, localized to the throat, tonsillar region, and back of the tongue, occasionally radiating to the ear, distinct from a similar condition affecting the face. Which cranial nerve is involved in this presentation?

A. The glossopharyngeal nerve, producing glossopharyngeal neuralgia with throat/tonsillar/ear pain triggered by swallowing or talking

B. The trigeminal nerve, producing trigeminal neuralgia with facial rather than throat pain

C. The facial nerve, producing Bell's palsy, a motor weakness condition rather than a neuralgic pain syndrome

169. A patient who underwent below-knee amputation several months ago reports a sharply localized, tender, palpable nodule at the end of the residual limb, with pain reproduced by direct percussion over

that specific spot, distinct from diffuse phantom sensations perceived as arising from the absent foot. What does this focal, palpable finding represent?

- A.** Phantom limb pain, perceived as arising from the absent distal limb rather than a focal palpable nodule at the residual limb itself
- B.** A traumatic (stump) neuroma, a focal, palpable, tender nodule of disorganized regenerating nerve fibers at the site of nerve transection
- C.** Complex regional pain syndrome, a diffuse autonomic/sensory syndrome rather than a focal palpable nodule

170. A patient reports weakness of thumb and index finger pinch (unable to make an "OK" sign) along with forearm pain near the elbow, but with entirely normal sensation, after compression of a deep motor branch of a major forearm nerve, distinct from a more commonly recognized sensory entrapment syndrome affecting a different branch of the same nerve. What condition does this represent?

- A.** Carpal tunnel syndrome, involving the median nerve at the wrist with sensory as well as motor findings
- B.** Anterior interosseous nerve syndrome, a pure motor branch of the median nerve producing thumb/index pinch weakness without sensory loss
- C.** Cubital tunnel syndrome, involving the ulnar nerve at the elbow rather than the median nerve

171. A patient undergoes a percutaneous radiofrequency rhizotomy of the trigeminal ganglion for refractory trigeminal neuralgia, achieving good initial relief, but months later develops a new, different type of pain in the same facial distribution -- a constant, burning, unpleasant sensation in an area that is now numb to light touch. What does this represent?

- A.** Recurrent trigeminal neuralgia, with the same brief, electric shock-like paroxysmal pain pattern as before the procedure
- B.** A new, unrelated case of temporomandibular disorder coincidentally developing in the same facial region
- C.** Anesthesia dolorosa, a constant, unpleasant, burning deafferentation pain arising within a now-numb area after nerve ablation

172. An older patient with an underlying plasma cell disorder develops progressive, painful peripheral neuropathy along with autonomic symptoms (orthostatic hypotension, early satiety) and is found to have

abnormal protein deposits infiltrating peripheral nerve tissue on biopsy. What condition does this represent?

- A.** Charcot-Marie-Tooth disease, a hereditary condition without protein deposits or an associated plasma cell disorder
- B.** Amyloid neuropathy, from abnormal protein (amyloid) deposits infiltrating peripheral nerves, associated with an underlying plasma cell disorder or hereditary amyloidosis
- C.** Guillain-Barre syndrome, an acute autoimmune demyelinating process without amyloid protein deposition

173. A patient who received radiation therapy to the axilla for breast cancer years ago develops slowly progressive numbness and mild weakness in a specific, isolated peripheral nerve distribution within the treatment field, without the more diffuse plexus involvement or prominent pain typically seen with a related, more extensive radiation-induced condition. What does this represent?

- A.** Radiation-induced peripheral neuropathy, an isolated nerve within the field, distinct from the more extensive plexopathy
- B.** Radiation-induced brachial plexopathy, affecting the entire plexus rather than one nerve
- C.** Guillain-Barre syndrome, an acute autoimmune process unrelated to prior radiation exposure

174. A patient who recently underwent ankle surgery reports burning pain and numbness along the outer edge of the foot and ankle, in the distribution of a small purely sensory nerve that arises from branches of the tibial and common peroneal nerves and can be injured during posterolateral ankle surgical approaches. Which nerve is involved?

- A.** The saphenous nerve, supplying the medial rather than lateral aspect of the leg and foot
- B.** The deep peroneal nerve, a mixed motor-sensory nerve rather than a purely sensory nerve
- C.** The sural nerve, a purely sensory nerve supplying the lateral foot and ankle, vulnerable to injury during posterolateral surgical approaches

175. A patient reports burning pain and numbness along the inner aspect of the knee and lower leg following a knee arthroscopy portal incision, in the distribution of a purely sensory terminal branch of the femoral nerve. Which nerve is involved?

- A.** The sural nerve, supplying the lateral rather than medial aspect of the leg and ankle region

- B.** The saphenous nerve, a sensory branch of the femoral nerve supplying the medial knee and leg, vulnerable near arthroscopy portals
- C.** The obturator nerve, supplying the medial thigh rather than the knee and lower leg region

176. A patient reports an uncomfortable, difficult-to-describe crawling or pulling sensation deep in both legs that occurs specifically in the evening while sitting or lying still, is partially relieved by movement, and worsens again with rest, without a clear structural or focal nerve entrapment explanation. What condition does this represent?

- A.** Restless legs syndrome, an uncomfortable urge to move the legs, worse at rest and in the evening, relieved by movement
- B.** Tarsal tunnel syndrome, a focal nerve entrapment producing fixed numbness rather than a movement-related urge
- C.** Meralgia paresthetica, a focal lateral thigh sensory disturbance rather than a bilateral, movement-related leg sensation

177. A patient develops persistent numbness, tingling, and burning pain in the distribution of the inferior alveolar nerve following a lower wisdom tooth extraction, distinct from the paroxysmal, triggered, electric shock-like pain pattern of a more classically recognized trigeminal pain condition. What does this represent?

- A.** Post-traumatic trigeminal neuropathy, from nerve injury during a dental procedure, producing persistent numbness distinct from classic neuralgia
- B.** Classic trigeminal neuralgia, with brief, triggered, electric shock-like pain rather than persistent numbness
- C.** Temporomandibular disorder, involving the jaw joint and muscles rather than direct nerve injury

178. A patient with type 2 diabetes develops sudden-onset, severe, asymmetric thigh and hip pain followed by progressive proximal leg weakness and muscle wasting, distinct from the more common symmetric distal sensory pattern of typical diabetic neuropathy. What condition does this represent?

- A.** Diabetic peripheral (distal symmetric sensorimotor) polyneuropathy, which produces a symmetric distal pattern rather than the asymmetric proximal presentation described here
- B.** Diabetic amyotrophy (diabetic lumbosacral radiculoplexus neuropathy), an asymmetric, painful, proximal motor-predominant neuropathy distinct from typical distal diabetic neuropathy

C. Diabetic autonomic neuropathy, affecting autonomic function rather than proximal motor strength

179. A newborn delivered after a difficult vaginal delivery involving significant shoulder dystocia is noted to have decreased movement and abnormal positioning of one arm, with the shoulder internally rotated and the elbow extended (a "waiter's tip" posture), attributed to a stretch injury of the upper brachial plexus roots sustained during delivery. What condition does this represent?

A. Congenital muscular torticollis, a neck muscle contracture rather than a brachial plexus nerve injury

B. Erb's palsy, an upper brachial plexus birth injury producing the characteristic "waiter's tip" arm posture

C. Adult traumatic brachial plexus injury, occurring from high-energy trauma rather than a birth-related stretch injury

180. A patient with a remote history of gastric bypass surgery develops progressive gait imbalance, numbness, and mild weakness, with laboratory testing revealing a specific trace mineral deficiency (distinct from the more commonly discussed vitamin B12 deficiency) known to cause a similar myeloneuropathy syndrome after bariatric surgery. What deficiency does this represent?

A. Vitamin B12 deficiency, the more commonly discussed nutritional deficiency after bariatric surgery, explicitly distinguished from the deficiency described in this vignette

B. Iron deficiency, which classically causes anemia-related symptoms rather than this myeloneuropathy pattern

C. Copper deficiency, a less commonly recognized but important cause of myeloneuropathy after bariatric surgery, producing a clinical picture that can resemble B12 deficiency

181. A patient reports recurrent episodes of numbness and weakness following even minor, brief nerve compression (such as crossing the legs briefly or leaning on an elbow), with each episode resolving over days to weeks, and a family history of similar recurrent, transient compression-related neuropathy episodes. What hereditary condition does this suggest?

A. Hereditary neuropathy with liability to pressure palsies (HNPP), causing unusually heightened susceptibility to recurrent, transient compression neuropathies

B. Guillain-Barre syndrome, an acquired autoimmune process without a hereditary pattern or specific relationship to minor compression

C. Chronic inflammatory demyelinating polyneuropathy, a chronic, progressive rather than recurrent, transient, compression-triggered condition

182. A patient with a remote history of occupational exposure to a specific heavy metal used in certain industrial processes develops a symmetric, painful sensorimotor polyneuropathy along with characteristic transverse white lines on the fingernails (Mees' lines) and GI symptoms. What toxic exposure does this suggest?

A. Lead exposure, which classically causes a motor-predominant neuropathy (such as wrist drop) rather than the painful sensorimotor pattern with Mees' lines described here

B. Arsenic exposure, causing a painful sensorimotor polyneuropathy along with characteristic Mees' lines and gastrointestinal symptoms

C. Mercury exposure, which classically causes neuropsychiatric and tremor symptoms rather than the specific Mees' lines and polyneuropathy pattern described here

183. A patient from a region where a particular chronic mycobacterial infection remains endemic develops patchy areas of numbness on the skin along with thickened peripheral nerves palpable on exam, and is ultimately diagnosed with a condition that remains a leading global infectious cause of peripheral neuropathy. What condition does this represent?

A. Leprosy, a chronic mycobacterial infection causing patchy skin numbness and thickened peripheral nerves

B. Guillain-Barre syndrome, an acute autoimmune process rather than a chronic infectious condition

C. Charcot-Marie-Tooth disease, a hereditary rather than infectious cause of neuropathy

184. A patient being treated for active tuberculosis develops progressive symmetric numbness and burning pain in the feet several months into therapy, attributed to the specific antituberculosis medication's interference with vitamin B6 (pyridoxine) metabolism, a well-recognized side effect that can be mitigated by pyridoxine supplementation. Which medication is responsible?

A. Isoniazid, which interferes with pyridoxine (vitamin B6) metabolism, causing peripheral neuropathy that can be mitigated with pyridoxine supplementation

- B.** Rifampin, which is not classically associated with pyridoxine-related peripheral neuropathy
- C.** Ethambutol, which is classically associated with optic neuropathy rather than a peripheral sensory neuropathy from pyridoxine interference

185. A physician providing pain management care within a correctional facility must balance appropriate treatment of a patient's documented chronic pain condition against institutional security concerns, restricted formularies, and elevated concern for medication diversion within that setting. What does this scenario illustrate?

- A.** Incarcerated patients have no right to any treatment for a documented chronic pain condition while in custody
- B.** Security and diversion concerns in a correctional setting are entirely irrelevant to clinical pain decisions
- C.** Correctional pain management requires balancing treatment needs against institution-specific security and diversion considerations

186. A pharmacogenomic panel performed for a patient with inadequate pain relief despite an adequate opioid dose reveals a variant in the mu-opioid receptor gene (OPRM1), distinct from a cytochrome P450 metabolizing enzyme variant, that is associated with altered opioid receptor binding and analgesic response. What does this finding illustrate?

- A.** CYP2D6 metabolizer status is the only pharmacogenomic factor that can ever influence a patient's opioid analgesic response
- B.** Variants beyond cytochrome P450 metabolizing enzymes, such as in the OPRM1 mu-opioid receptor gene itself, can also contribute to individual variability in opioid analgesic response
- C.** Pharmacogenomic testing has no established relevance to opioid analgesic response of any kind and should never be considered

187. A patient's insurance plan requires the prescribing physician to submit extensive documentation and obtain approval before a recommended non-opioid medication or interventional procedure will be covered, resulting in a delay of several weeks before treatment can begin. What does this scenario illustrate?

- A.** Prior authorization requirements can create meaningful administrative barriers and treatment delays that affect timely access to recommended, non-opioid pain treatments

B. Insurance-related administrative processes have no meaningful effect on the timeliness of pain treatment access in any circumstance

C. Prior authorization requirements apply exclusively to opioid medications and are never required for non-opioid treatments or procedures

188. A patient with a work-related back injury must navigate a workers' compensation system involving an assigned case manager, mandated independent medical evaluations, and treatment authorization processes distinct from standard health insurance, which can influence both the pace and scope of the patient's pain treatment. What does this scenario illustrate?

A. Workers' compensation systems have no distinct features compared to standard health insurance coverage

B. Independent medical evaluations have no bearing on treatment authorization or pace of care

C. Workers' compensation involves distinct structures (case management, evaluations, authorization) that shape a patient's treatment course

189. A patient with a visible physical disability reports that clinicians sometimes assume the disability itself fully explains all of their pain complaints, occasionally leading to less thorough evaluation of new or changing pain symptoms that might indicate a separate, unrelated problem. What does this scenario illustrate?

A. A visible physical disability always fully and completely explains any pain a patient with that disability might report, making further evaluation of new symptoms unnecessary

B. Assumptions based on a patient's visible disability can sometimes lead to diagnostic overshadowing, in which new or changing pain symptoms are not evaluated as thoroughly as they would be otherwise

C. Patients with visible physical disabilities never experience any bias or assumption-related effects on the quality of their pain evaluation and care

190. A patient with a progressive, life-limiting illness and worsening chronic pain has a structured conversation with their physician about future goals of care, preferred interventions versus those they would decline, and designation of a healthcare decision-maker, documented well before a medical crisis requires those decisions to be made urgently. What is this process called?

- A.** Informed consent for a single specific procedure, addressing only the immediate planned intervention
- B.** Surrogate decision-making, which is invoked only once a patient has already lost decision-making capacity
- C.** Advance care planning, a structured, proactive discussion of future goals of care and decision-maker designation before a crisis requires those decisions urgently

191. A patient with chronic pain is invited to participate in a clinical trial testing a new investigational analgesic, and before enrolling, the research team explains the trial's purpose, potential risks and benefits, the voluntary nature of participation, and the patient's right to withdraw at any time, distinct from consent for standard, established clinical treatment. What process does this represent?

- A.** Standard informed consent for an already-established, standard-of-care treatment, identical in every respect to consent for participating in research
- B.** Informed consent for research participation, which includes additional specific elements (such as the investigational nature of the intervention and the right to withdraw) beyond standard treatment consent
- C.** Surrogate decision-making, applicable only when a patient lacks decision-making capacity to consent for themselves

192. A physician treating a veteran with chronic pain must navigate a healthcare system with its own distinct network of facilities, referral processes, and formulary, along with an eligibility and enrollment structure that differs meaningfully from civilian health insurance systems. What does this scenario illustrate?

- A.** Military and veteran healthcare systems have no meaningfully distinct structural features compared to civilian health insurance and care delivery systems
- B.** Eligibility and enrollment structures within veteran healthcare systems have no bearing on a patient's actual access to pain treatment services
- C.** Navigating a veteran-specific healthcare system involves distinct structural features (dedicated facility networks, referral processes, formulary, and eligibility rules) that can meaningfully shape a patient's pain care access

193. A patient with a documented history of opioid use disorder now in stable, sustained remission for several years develops a new chronic pain condition requiring treatment, and the physician must weigh legitimate pain treatment needs against the patient's own concerns about relapse risk, favoring non-opioid approaches where reasonably effective while remaining open to careful, monitored opioid use if genuinely needed. What does this scenario illustrate?

- A.** Chronic pain treatment in a patient with substance use disorder in stable remission requires individualized, careful weighing of legitimate pain needs against relapse risk, rather than a reflexive blanket approach in either direction
- B.** A history of substance use disorder in remission has no bearing whatsoever on how a subsequent chronic pain condition should be approached or managed
- C.** Any patient with any history of substance use disorder, regardless of duration of remission, must be permanently and categorically denied all opioid medications under all circumstances

194. A competitive athlete subject to anti-doping regulations develops a chronic pain condition, and the treating physician must verify that any prescribed medication (including certain otherwise-routine analgesics) is not on a prohibited substances list before prescribing, to avoid jeopardizing the athlete's competition eligibility. What does this scenario illustrate?

- A.** Anti-doping regulations have no bearing on which analgesic medications can appropriately be prescribed to a competitive athlete
- B.** Treating an athlete's chronic pain requires awareness of anti-doping rules, since routine analgesics may be prohibited and jeopardize eligibility
- C.** All analgesic medications, without exception, are prohibited under anti-doping regulations for any competitive athlete

195. A pain clinic in a region prone to natural disasters develops a protocol to help chronic pain patients maintain an emergency supply of essential medications, along with a written plan for how to obtain refills if local pharmacy access is disrupted by a hurricane or similar event. What does this protocol address?

- A.** A concern that has no realistic likelihood of affecting a chronic pain patient's medication access or continuity of care under any circumstances
- B.** A requirement that applies only to opioid medications and has no relevance to any other chronic pain medication a patient might be taking

C. Continuity of essential medication access for chronic pain patients during a disaster or other disruption to normal pharmacy and healthcare access

196. An elderly patient with chronic pain is offered telehealth follow-up visits to reduce travel burden, but the patient lacks a reliable smartphone or computer and has difficulty navigating video-calling software, ultimately requiring an in-person visit or a phone-only option instead. What does this scenario illustrate?

A. Every patient offered telehealth has equal, reliable ability to access and use video-based telehealth technology without any need for accommodation

B. Limited digital literacy or technology access has no bearing whatsoever on a patient's ability to actually benefit from a telehealth care option

C. Limited digital literacy or lack of reliable technology access can itself function as a barrier to telehealth-based care, requiring alternative accommodations such as phone-only visits or continued in-person care

197. A recently arrived immigrant patient with chronic pain is unfamiliar with how to navigate referrals, insurance enrollment, and the overall structure of the healthcare system in their new country, requiring additional care coordination support beyond simply addressing the language barrier alone. What does this scenario illustrate?

A. Immigrant and refugee patients may face healthcare system navigation barriers distinct from and in addition to language barriers alone, requiring additional care coordination support

B. Language interpretation services alone are always fully sufficient to address every barrier an immigrant or refugee patient might face in accessing chronic pain care

C. Immigrant and refugee patients face no meaningful barriers to healthcare system navigation beyond those faced by any other patient population

198. A pain clinic notices that patients with Medicaid coverage experience longer wait times and more limited access to certain interventional pain procedures compared to patients with private insurance, related in part to differences in reimbursement rates and provider participation across different insurance types. What does this observation illustrate?

A. Insurance type has no meaningful relationship to a patient's access to interventional pain procedures in current healthcare delivery systems

B. All insurance types, without exception, provide completely identical reimbursement rates and provider participation for interventional pain procedures

C. Disparities in access to interventional pain procedures can exist based on insurance type, related to differences in reimbursement rates and provider participation across different coverage types

199. A patient with chronic pain who does not own a car and relies on limited public transportation repeatedly misses scheduled physical therapy appointments and interventional procedure follow-ups, not due to lack of motivation but due to genuine difficulty reaching the clinic location. What does this scenario illustrate?

A. Limited transportation access can itself function as a meaningful barrier to consistent chronic pain treatment engagement, independent of a patient's motivation or adherence intent

B. Missed appointments in chronic pain care always reflect a lack of patient motivation or engagement, never a practical access barrier like transportation

C. Transportation access has no meaningful relationship to a patient's ability to attend scheduled chronic pain treatment appointments

200. A patient whose chronic pain condition has progressed to the point of being unable to continue their physically demanding job experiences job loss, and the care team recognizes this as both a significant psychosocial stressor and a factor that can itself worsen the patient's pain and disability trajectory through loss of income, structure, and identity. What does this scenario illustrate?

A. Job loss related to chronic pain has no meaningful psychosocial impact on a patient beyond the purely financial consequences of lost income

B. A patient's employment status has no bearing whatsoever on their chronic pain or disability trajectory in either direction

C. Job loss resulting from chronic pain can itself function as a significant psychosocial stressor that may further worsen a patient's pain and disability trajectory, extending beyond financial impact alone

Answers

- 1. C.** Temporal summation describes the progressive increase in perceived pain intensity produced by repeated identical noxious stimuli at a constant intensity, a psychophysical phenomenon linked to windup at the spinal cord level, matching this vignette's description precisely. Habituation describes a progressive DECREASE in response to a repeated stimulus, which is the opposite of the increasing pain intensity described in this vignette. Allodynia describes pain from a stimulus that is not normally painful at all (such as light touch), not an increasing response to a stimulus that is already painful, as described in this vignette.
- 2. B.** Gate control theory, proposed by Melzack and Wall, describes how activity in large-diameter, non-nociceptive afferent fibers can inhibit nociceptive signal transmission at the spinal dorsal horn, providing the theoretical basis for interventions like rubbing an injured area or TENS therapy, matching this vignette's description exactly. The neuromatrix theory is a distinct, later model proposing pain arises from a widely distributed brain network generating a characteristic neurosignature, not the specific dorsal horn gating mechanism described in this vignette. The biopsychosocial model is a broader conceptual framework encompassing biological, psychological, and social contributors to pain, not the specific spinal gating mechanism described in this vignette.
- 3. B.** The diathesis-stress model proposes that chronic pain (or other conditions) develops from the combination of an underlying vulnerability (diathesis) and a significant precipitating stressor, with neither factor alone being sufficient, matching this vignette's description of the interacting vulnerability-and-stressor framework precisely. Gate control theory describes a specific spinal cord mechanism of nociceptive signal modulation, not the vulnerability-plus-stressor framework for chronic pain development described in this vignette. The WHO analgesic ladder is a pharmacologic treatment escalation framework, entirely unrelated to the etiologic vulnerability-stressor model described in this vignette.
- 4. A.** Selection bias arises when there are systematic differences between the groups being compared due to how patients were selected or self-selected into each group (here, choosing a specialized clinic versus general practice), which can confound the observed outcome difference, matching this vignette's description precisely. Recall bias relates specifically to differential accuracy of memory when patients report past exposures, not the systematic difference in who ends up in each treatment setting described in this vignette. Publication bias relates to which STUDIES get published based on their results, an entirely different phenomenon from the patient-selection issue within a single study described in this vignette.
- 5. C.** Allocation concealment specifically prevents the person enrolling participants from knowing or influencing an upcoming participant's group assignment, typically through a centralized or independent randomization system, protecting against selection bias at the point of enrollment, matching this vignette's description precisely. Double-blinding refers to participants and outcome assessors not knowing which treatment was received AFTER assignment, a related but distinct safeguard from the enrollment-time concealment described in this vignette. Intention-to-treat analysis is a statistical analysis

approach for handling trial data based on original group assignment, an entirely different methodological consideration from the enrollment-time concealment described in this vignette.

6. C. Autonomy is the ethical principle centered on a patient's right to self-determination, including the right to accept or decline recommended treatment after adequate informed discussion, which is exactly the principle being honored when the physician respects this competent patient's decision, matching this vignette precisely. Beneficence concerns the physician's own obligation to act for the patient's benefit, which is actually in tension with, not the principle being honored by, respecting the patient's contrary decision in this vignette. Non-maleficence concerns avoiding harm, which is not the primary principle at stake when a physician defers to a competent patient's informed decision against a recommended beneficial procedure, as described in this vignette.

7. A. Justice is the ethical principle concerned with the fair and equitable distribution of limited healthcare resources, and developing a transparent, criteria-based prioritization system for scarce interventional appointment slots is a direct application of this principle, matching this vignette's description precisely. Fidelity concerns keeping commitments and promises made to individual patients, not the broader resource-allocation fairness question being addressed by this prioritization system. Veracity concerns truthfulness in communication with patients, an entirely different ethical consideration from the resource-distribution fairness question described in this vignette.

8. B. Conflict of interest disclosure requires a physician to inform an audience or patient of a financial relationship (such as consulting fees from a manufacturer) that could potentially influence their recommendations, allowing the audience to critically evaluate the information with that context, matching this vignette's described practice exactly. HIPAA governs the privacy and disclosure of protected health information, an entirely different regulatory domain from disclosing a financial relationship to a lecture audience. Informed consent concerns a patient's understanding and agreement to a proposed medical procedure, an entirely different concept from a speaker disclosing a financial relationship before a lecture.

9. B. A nurse practitioner is an advanced practice clinician with graduate nursing education and certification who can independently evaluate, diagnose, and prescribe within a scope of practice that varies meaningfully by state regulation, matching this vignette's description precisely. Physician assistants also have state-specific scope variation (not an identical scope in every state), and their training pathway and supervision requirements differ from what is described in this vignette, making this option's identical-in-every-state claim inaccurate regardless. A licensed clinical psychologist's prescribing authority is highly limited and, in most states, they cannot prescribe medication at all, which does not match this vignette's description of a provider who can prescribe certain medications.

10. C. An opioid treatment agreement is a document outlining expectations such as single-pharmacy use, periodic urine drug testing, and safe storage requirements, agreed upon by the patient before starting long-term opioid therapy, matching this vignette's description precisely. An advance directive addresses end-of-life care decisions and healthcare proxy designation, an entirely different type of document from

the opioid therapy expectations agreement described in this vignette. A HIPAA authorization form addresses release of protected health information to a third party, an entirely different purpose from the opioid therapy expectations and monitoring terms described in this vignette.

11. A. The Visual Analog Scale uses an unmarked line, typically 10 centimeters long, anchored by "no pain" and "worst pain imaginable," with the patient's mark measured as a distance to quantify pain intensity, matching this vignette's description precisely. The Numeric Rating Scale asks patients to select a whole number (typically 0-10) rather than mark a point along an unmarked continuous line, making it a distinct tool from the one described in this vignette. The Wong-Baker FACES scale uses a series of facial expression images rather than a marked line, making it a distinct tool from the one described in this vignette.

12. A. The Wong-Baker FACES scale uses a row of cartoon faces ranging from smiling to crying, allowing a young child to point to the face matching their pain level, which is a validated, age-appropriate self-report tool matching this vignette's description precisely. The Numeric Rating Scale requires the patient to select an abstract number, which is generally less reliable and appropriate for young children compared to the concrete visual faces described in this vignette. The Brief Pain Inventory is a more complex, multi-item questionnaire assessing severity and interference, not the simple single-item pictorial tool described in this vignette for a young child.

13. B. The PEG scale is a brief, validated 3-item tool assessing average Pain, interference with Enjoyment of life, and interference with General activity, specifically designed for quick, repeated monitoring of chronic pain patients at routine visits, matching this vignette's description precisely. The full Brief Pain Inventory is a longer, more comprehensive multi-item tool, not the brief 3-item version specifically described in this vignette. The Oswestry Disability Index is a longer, back-specific functional disability tool, not the brief, condition-general 3-item monitoring tool described in this vignette.

14. A. The Roland-Morris Disability Questionnaire is a validated 24-item yes/no tool asking about specific activities affected by low back pain, used to quantify back-pain-related functional disability, matching this vignette's item format and content precisely. The Oswestry Disability Index is also a back-pain disability tool but uses a different format (graded multiple-choice items scored as a percentage), not the 24-item yes/no format specifically described in this vignette. The Pain Catastrophizing Scale measures cognitive-affective responses to pain such as rumination, not functional disability related to specific activities, making it a different type of instrument from the one described here.

15. A. Von Frey filaments are thin, flexible nylon filaments of graded, increasing stiffness applied to determine the minimum force needed for a patient to detect mechanical touch, quantifying a mechanical detection threshold, matching this vignette's tool and methodology precisely. A pressure algometer applies steadily increasing pressure to determine the point at which a sensation becomes PAINFUL (pressure pain threshold), a related but distinct measurement from the touch DETECTION threshold measured by Von Frey filaments in this vignette. Electromyography assesses electrical activity of

muscle in response to nerve stimulation, an entirely different modality from the graded mechanical filament testing described in this vignette.

16. C. The PainDETECT questionnaire is a validated self-report tool combining pain quality descriptors, pain course pattern, and radiation, along with an intensity rating, specifically designed to estimate the likelihood of a neuropathic pain component in conditions like low back pain, matching this vignette's description precisely. The Oswestry Disability Index measures functional disability related to low back pain, not neuropathic pain likelihood based on symptom quality, making it a different type of instrument from the one described here. The Roland-Morris Disability Questionnaire also measures back-pain-related functional disability through yes/no activity items, not neuropathic symptom quality screening, making it an unrelated tool for this purpose.

17. A. The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) combines a structured pain history interview with a brief bedside sensory examination to produce a score distinguishing neuropathic from nociceptive pain mechanisms, matching this vignette's described combined-methodology tool precisely. The Central Sensitization Inventory is a self-report questionnaire alone, without the bedside sensory examination component that is central to the tool described in this vignette. The STarT Back tool stratifies risk of chronic disabling back pain for treatment triage purposes, not neuropathic-versus-nociceptive mechanism differentiation as described in this vignette.

18. B. Waddell signs are a recognized set of physical examination findings, including axial loading pain, simulated rotation pain, and overreaction, that suggest a non-organic or non-structural component to a patient's reported pain, matching this vignette's specific findings and clinical significance precisely. A positive straight leg raise test specifically indicates lumbar nerve root tension from a structural cause like disc herniation, an entirely different exam finding and clinical significance from the non-organic Waddell signs described in this vignette. The Spurling test evaluates for cervical radiculopathy through neck extension and compression, an entirely different exam maneuver and anatomic region from the lumbar Waddell signs described in this vignette.

19. C. Actigraphy uses a small wrist-worn device to continuously and objectively record movement patterns and sleep-wake cycles over an extended period, providing objective data on activity and sleep to complement subjective pain reports, matching this vignette's description of the technology and its purpose precisely. Quantitative sensory testing measures sensory detection or pain thresholds using standardized stimuli at a single testing session, an entirely different modality from the continuous, objective movement-and-sleep monitoring described in this vignette. Pressure algometry measures the pressure pain threshold at a single testing session using a handheld device, an entirely different modality from the continuous wearable monitoring described in this vignette.

20. C. The Graded Chronic Pain Scale classifies patients into severity grades based on a combination of pain intensity and pain-related disability, providing an overall chronic pain severity characterization for research and clinical use, matching this vignette's description precisely. The WHO analgesic ladder is a pharmacologic treatment escalation framework, not a severity classification system based on intensity

and disability grading as described in this vignette. The ACR 2016 fibromyalgia diagnostic criteria is a disease-specific diagnostic tool for fibromyalgia, not a general chronic pain severity grading system applicable across conditions as described in this vignette.

21. A. Hydromorphone's active metabolite is produced in smaller quantities and is generally considered less clinically significant than morphine's active metabolite (morphine-6-glucuronide), which can accumulate and cause toxicity in renal impairment, making hydromorphone a relatively preferred option in this population. Hydromorphone is hepatically metabolized, not "entirely metabolized by the kidney," and it still requires dose adjustment and cautious titration in renal impairment, making this option factually incorrect. Hydromorphone is a potent opioid with a real, meaningful pharmacologic rationale for this preference (its metabolite profile), not merely a cost-based substitution with no potency-related consideration.

22. C. Levorphanol, like methadone, has NMDA receptor antagonist activity in addition to its mu-opioid receptor agonism, which is thought to provide additional benefit for pain with a significant neuropathic or centrally sensitized component, matching this vignette's description of an additional mechanism precisely. Levorphanol's clinically relevant opioid activity is at the mu receptor, and its additional relevant mechanism is NMDA antagonism, not selective kappa receptor agonism, making this option inaccurate. Levorphanol has no cyclooxygenase inhibitory activity; that mechanism describes NSAIDs, an entirely different and unrelated drug class from levorphanol's actual dual mu-agonist/NMDA-antagonist mechanism.

23. B. Equianalgesic dosing uses standardized relative potency ratios between different opioids, combined with an appropriate dose reduction to account for incomplete cross-tolerance, to calculate a safe and effective starting dose when converting a patient between opioids, matching this vignette's described calculation process precisely. Different opioids have substantially different potencies (this is precisely why a conversion table and calculation are needed), so claiming all opioids are exactly equipotent milligram-for-milligram directly contradicts the entire premise and necessity of equianalgesic conversion. Using the identical numeric milligram dose of a different, non-equipotent opioid would be a dangerous and potentially fatal error, since different opioids have very different potencies, making this option clinically incorrect and unsafe.

24. C. Partial agonists, as a pharmacologic class, exhibit a ceiling effect in which their maximal effect (analgesic or respiratory depressant) plateaus once enough receptors are occupied, with no further increase from additional dose, distinguishing them from full agonists, matching this vignette's described property precisely. Full mu-opioid receptor agonists like morphine or fentanyl characteristically do NOT exhibit a ceiling effect; their effect continues to increase with dose (up to the point of toxicity), which is the opposite property from what is described in this vignette. PAMORAs are peripherally restricted antagonists used for opioid-induced constipation, an entirely different pharmacologic class and mechanism from the ceiling-effect partial agonist property described in this vignette.

25. B. The Pasero Opioid-Induced Sedation Scale is a standardized nursing assessment tool specifically designed to monitor sedation level after opioid administration, using defined numeric levels to trigger an early nursing response before respiratory depression develops, matching this vignette's description and specific clinical purpose precisely. The Glasgow Coma Scale assesses level of consciousness after brain injury or in critical illness, a different clinical context from opioid-induced sedation monitoring in a general postoperative unit as described in this vignette. The Ramsay Sedation Scale is used primarily in the ICU setting for titrating sedation in mechanically ventilated patients, a different specific clinical application from the opioid-induced sedation monitoring tool described in this vignette.

26. A. Naloxone is included in this combination product specifically to deter intravenous misuse: it has poor sublingual bioavailability (remaining largely inactive when taken as directed) but would precipitate opioid withdrawal if the product were dissolved and injected, discouraging that route of misuse, matching this vignette's description precisely. Naloxone is an opioid antagonist and provides no additional analgesic effect; its role in this formulation is specifically abuse-deterrence, not enhanced analgesia, making this option incorrect. Naloxone's poor sublingual bioavailability does not prevent buprenorphine's own separate sublingual absorption and clinical effect when the product is taken as directed; the product is specifically designed to work normally via the intended sublingual route.

27. C. Opioid-induced immunosuppression describes emerging evidence that chronic opioid exposure can alter immune parameters, including natural killer cell activity, distinct from opioids' more commonly recognized analgesic, sedative, or gastrointestinal effects, matching this vignette's description precisely. Opioid-induced hyperalgesia describes a paradoxical increase in pain sensitivity with opioid exposure, an entirely different phenomenon from the immune parameter changes described in this vignette. Opioid-induced androgen deficiency describes suppression of the hypothalamic-pituitary-gonadal axis leading to low testosterone, an entirely different endocrine effect from the immune-parameter changes described in this vignette.

28. A. Heat exposure, whether from fever or an external heat source like a heating pad, increases cutaneous blood flow and can significantly increase the rate of fentanyl release and absorption from a transdermal patch, creating a genuine risk of unintentional overdose and respiratory depression, matching this vignette's described safety concern precisely. This is a well-documented and clinically significant safety concern (heat DOES meaningfully affect absorption rate), directly contradicting a claim that heat exposure has no effect on transdermal fentanyl absorption. Heat does not destroy or inactivate the fentanyl within the patch; the concern is the opposite -- increased, more rapid release and absorption of the still-active drug, not degradation to an inactive form.

29. B. Indomethacin is specifically recognized among NSAIDs for a relatively higher rate of central nervous system side effects, including headache, dizziness, and difficulty concentrating, which is an important consideration when selecting this particular agent, matching this vignette's description precisely. Indomethacin still carries the class-wide NSAID risk of gastrointestinal side effects (in fact, it is often considered to have a relatively higher GI risk among NSAIDs), so claiming it is uniquely free of GI side effects is incorrect. Indomethacin does cross into the central nervous system, which is precisely

why it produces the CNS side effects described in this vignette, making a claim of no CNS penetration incorrect.

30. C. Diclofenac, despite its traditional classification as a nonselective NSAID, exhibits relatively greater COX-2 selectivity in practice than this classification suggests, which is thought to contribute to a cardiovascular risk profile more similar to some COX-2-selective agents, matching this vignette's described observation and its accepted explanation. Cardiovascular risk varies meaningfully between different nonselective NSAIDs (this is precisely the point being illustrated by diclofenac's distinct profile), so claiming all nonselective NSAIDs have an identical, low cardiovascular risk profile is incorrect. Diclofenac's cardiovascular risk profile has been studied extensively in large observational studies and meta-analyses, so claiming it remains completely unknown is factually incorrect.

31. B. The distinction between COX-1's constitutive expression in the gastric mucosa and platelets versus COX-2's predominantly inflammation-induced expression (with some constitutive expression elsewhere) helps explain why COX-1 inhibition is more directly linked to GI and platelet effects, while COX-2 inhibition drives more of the anti-inflammatory/analgesic effect, though it carries its own distinct risks from inhibiting constitutive COX-2 in tissues like the kidney and vasculature. This distinction is precisely why different NSAIDs (varying in COX-1/COX-2 selectivity) have DIFFERENT, not identical, side-effect profiles, making this option directly contradict the point being illustrated. NSAIDs, through COX-1 inhibition specifically, have well-documented, clinically significant effects on both gastric mucosal integrity and platelet function, making a claim of no meaningful effect on either incorrect.

32. A. In volume-depleted states, renal blood flow becomes more dependent on compensatory prostaglandin-mediated vasodilation of the afferent arteriole, and NSAIDs block this compensatory prostaglandin synthesis, precipitating acute kidney injury -- exactly the mechanism explaining this vignette's increased nephrotoxicity risk in dehydration. Dehydration/volume depletion is a well-recognized, clinically significant risk factor that specifically increases NSAID-related nephrotoxicity risk through the prostaglandin-dependent mechanism described, making a claim of no bearing on risk incorrect. NSAID nephrotoxicity in this setting is a hemodynamically mediated injury from blocked compensatory vasodilation, not a crystal deposition mechanism (which describes a different type of renal injury, such as from certain other drugs or conditions like gout).

33. B. Ibuprofen can competitively occupy the platelet COX-1 binding site that aspirin needs to irreversibly acetylate, and if ibuprofen is taken before aspirin, it can block aspirin's access to that site, potentially interfering with aspirin's cardioprotective irreversible antiplatelet effect, which is exactly the timing-dependent interaction described in this vignette. This is a well-documented, clinically significant pharmacodynamic interaction at the platelet COX-1 level, so claiming no interaction exists is incorrect and could lead to inadequate cardioprotection if timing advice is disregarded. Ibuprofen's interaction is a reversible, competitive binding-site interaction affecting NEW platelet activity, not permanent destruction of existing circulating platelets, and does not require any washout period, making this option's severity claim inaccurate.

34. B. NSAID-related inhibition of renal prostaglandin synthesis can reduce renin release and downstream aldosterone secretion, impairing the kidney's ability to excrete potassium and leading to a mild rise in serum potassium, particularly in patients with underlying kidney disease, matching this vignette's finding and mechanism precisely. NSAIDs do not act on gastrointestinal potassium absorption; their electrolyte effect is mediated through the renal prostaglandin-renin-aldosterone pathway, not a GI absorption mechanism, making this option incorrect. NSAID-related hyperkalemia is a real, recognized, and clinically relevant effect, particularly in patients with reduced kidney function, so claiming there is no plausible mechanism is factually incorrect.

35. C. Reye syndrome is a rare but serious condition involving acute liver failure and encephalopathy, specifically associated with aspirin use in children during viral illnesses such as influenza or varicella, which is exactly the risk this pediatric warning is designed to prevent, matching this vignette's description precisely. NSAID-induced acute kidney injury is a general risk not specifically tied to the combination of pediatric age and concurrent viral illness that defines the Reye syndrome warning described in this vignette. Salicylate-induced tinnitus is a reversible sign of salicylate toxicity at high doses, an entirely different and much less severe concern from the serious hepatic/neurologic Reye syndrome risk described in this vignette.

36. A. Bupropion is a norepinephrine-dopamine reuptake inhibitor (NDRI), a mechanism distinct from the serotonergic/noradrenergic mechanisms of SNRIs and TCAs typically used for pain, and it is notable for a relatively favorable side-effect profile regarding sedation and weight gain, matching this vignette's description and clinical rationale precisely. Bupropion has minimal serotonergic activity and works through a fundamentally different monoamine mechanism (norepinephrine and dopamine, not serotonin), making an SSRI mechanism description incorrect. Bupropion has no GABA-B receptor activity; that mechanism describes baclofen, an entirely different and unrelated drug class from bupropion's actual dopamine/norepinephrine mechanism.

37. C. Mirtazapine is recognized for sedating and appetite-stimulating secondary effects, particularly at lower doses, making it a useful choice for a patient with chronic pain, comorbid insomnia, and poor appetite, matching this vignette's clinical rationale precisely. Mirtazapine's recognized secondary effects are sedation and appetite stimulation, not stimulant-like alertness and appetite suppression, which would actually worsen rather than help this patient's specific symptoms, making this option the opposite of the correct answer. Mirtazapine is not primarily recognized for a diuretic or blood-pressure-lowering effect; its clinically relevant secondary effects in this context are specifically sedation and appetite stimulation, not effects on fluid balance or blood pressure.

38. A. Descending pain-inhibitory pathways from the brainstem rely on both serotonergic AND noradrenergic neurotransmission, so SNRIs, which engage both systems, are thought to provide more complete pain-modulating benefit than SSRIs, which primarily affect serotonin without meaningful noradrenergic activity, matching this vignette's pharmacologic explanation precisely. SSRIs DO affect serotonin, a neurotransmitter system genuinely relevant to some aspects of pain modulation, so claiming they have no effect whatsoever on any pain-relevant neurotransmitter system is incorrect. SNRIs and

SSRIs are pharmacologically distinct classes (SNRIs add meaningful norepinephrine reuptake inhibition that SSRIs lack), which is precisely why they differ in pain efficacy, making a claim of pharmacologic identity incorrect.

39. C. Lacosamide selectively enhances the slow inactivation of voltage-gated sodium channels, a mechanism distinct from the alpha-2-delta calcium channel subunit binding used by gabapentin and pregabalin, offering an alternative mechanistic option for patients who do not tolerate gabapentinoids, matching this vignette's description precisely. Lacosamide's mechanism is sodium channel-based, not alpha-2-delta calcium channel binding; describing it as identical to gabapentin and pregabalin's mechanism is incorrect and misses the entire point of offering a mechanistically distinct alternative. Lacosamide has no meaningful GABA-A receptor potentiating activity; that mechanism describes benzodiazepines, an entirely different drug class and mechanism from lacosamide's actual sodium channel action.

40. A. Zonisamide has multiple proposed mechanisms of action, including sodium channel blockade, T-type calcium channel blockade, and carbonic anhydrase inhibition, reflecting its broad and not fully elucidated pharmacology, matching this vignette's description of a multi-mechanism anticonvulsant precisely. Zonisamide's mechanism is broader and more varied than a single, precisely defined alpha-2-delta calcium channel binding mechanism, which specifically describes gabapentin and pregabalin, not zonisamide. Zonisamide has no meaningful TRPV1 receptor antagonist activity; that mechanism describes capsaicin, an entirely unrelated analgesic agent from zonisamide's actual multi-mechanism anticonvulsant profile.

41. B. Levetiracetam's situation illustrates that anticonvulsant efficacy for seizures does not automatically translate to efficacy for neuropathic pain, and each specific agent's pain-related evidence base must be evaluated independently rather than assumed from its seizure indication, which is the correct concept being tested in this vignette. This vignette explicitly describes levetiracetam as lacking strong, consistent evidence for pain despite being an effective anticonvulsant, directly contradicting a claim that all anticonvulsants are equally effective for neuropathic pain regardless of evidence base. This vignette explicitly states levetiracetam has NOT shown strong, consistent evidence for neuropathic pain, directly contradicting a claim that it is the single most effective anticonvulsant for this indication.

42. A. Phenytoin's mechanism relevant to its historical use in trigeminal neuralgia and neuropathic pain is voltage-gated sodium channel blockade, stabilizing neuronal membranes and reducing the repetitive high-frequency firing characteristic of neuropathic pain conditions, matching this vignette's historical context and mechanism precisely. Phenytoin has no meaningful serotonin reuptake inhibitor activity; that mechanism describes a completely different drug class (SSRIs) unrelated to phenytoin's actual sodium channel mechanism. Phenytoin has no opioid receptor activity whatsoever; it is a sodium channel-blocking anticonvulsant, entirely unrelated to any opioid mechanism.

43. C. Memantine is an NMDA receptor antagonist, sharing this general mechanism conceptually with ketamine (both target the NMDA receptor for central sensitization-related pain), but as a distinct specific

agent available in an oral formulation, more commonly recognized for its use in Alzheimer disease, matching this vignette's description precisely. Memantine has no meaningful serotonin or norepinephrine reuptake inhibitor activity; that mechanism describes SNRIs like duloxetine, an entirely different drug class from memantine's actual NMDA-based mechanism. Memantine does not act through alpha-2-delta calcium channel subunit binding; that mechanism describes gabapentin, a pharmacologically distinct drug from memantine's actual NMDA receptor mechanism.

44. B. Clonidine is a central alpha-2 adrenergic agonist that reduces the noradrenergic surge from the locus coeruleus responsible for autonomic opioid withdrawal symptoms such as sweating, anxiety, and hypertension, providing symptomatic relief during a taper without itself being an opioid, matching this vignette's clinical use and mechanism precisely. Clonidine has no direct opioid receptor activity; it works through an entirely separate adrenergic mechanism to blunt withdrawal symptoms, not by replacing the opioid's own receptor effect. Clonidine has no meaningful serotonin reuptake inhibitor activity; its withdrawal-symptom-reducing mechanism is specifically noradrenergic (alpha-2 agonism), not serotonergic.

45. A. Propranolol's migraine-preventive effect is attributed to beta-adrenergic receptor blockade, thought to stabilize cerebral vascular tone and reduce cortical excitability relevant to migraine pathophysiology, among other proposed mechanisms, making it a well-established, guideline-recommended migraine preventive option, matching this vignette's description precisely. Propranolol has no direct serotonin 5-HT_{1B/1D} receptor agonist activity; that mechanism describes triptans, an entirely different drug class used for ACUTE migraine treatment, not the beta-blocker's preventive mechanism. Propranolol has no CGRP receptor antagonist activity; that mechanism describes a distinct, much newer class of migraine-preventive monoclonal antibodies, not the beta-blocker mechanism described in this vignette.

46. C. High-dose riboflavin (vitamin B₂), along with magnesium and coenzyme Q₁₀, are nutraceutical options that have shown some supporting evidence for reducing migraine frequency, making them reasonable options to discuss for a patient preferring to avoid prescription medication, matching this vignette's request precisely. Vitamin K has no recognized role in migraine prevention; the nutraceuticals with genuine supporting evidence in this context are riboflavin, magnesium, and coenzyme Q₁₀, not vitamin K. Iron supplementation is not among the nutraceuticals recognized for migraine-preventive evidence; it is used for iron deficiency, an unrelated indication from the migraine-preventive nutraceuticals described in this vignette.

47. B. Calcitonin gene-related peptide (CGRP) or its receptor is the specific target of this newer class of monoclonal antibody migraine preventives, addressing a neuropeptide directly implicated in migraine pathophysiology, representing a migraine-specific mechanism distinct from repurposed medications, matching this vignette's description precisely. This class of migraine preventives does not work through voltage-gated sodium channel blockade; that mechanism describes older anticonvulsants like topiramate, a different mechanistic class from the CGRP-targeted antibodies described in this vignette. This class does not work through dopamine D₂ receptor blockade; that mechanism describes certain antiemetics

and antipsychotics, an entirely different and unrelated target from the CGRP-targeted antibodies described in this vignette.

48. C. Triptans act as agonists at 5-HT_{1B/1D} serotonin receptors on cranial blood vessels and trigeminal nerve terminals, producing vasoconstriction and inhibiting the release of inflammatory neuropeptides like CGRP, providing acute abortive relief for migraine attacks, matching this vignette's description of mechanism and clinical use precisely. Beta-blockers are used for migraine PREVENTION, not acute abortive treatment, and work through an entirely different beta-adrenergic mechanism from the serotonin receptor agonism described in this vignette. Anticonvulsants like topiramate are also used for migraine PREVENTION, not acute abortive treatment, and work through sodium channel blockade rather than the serotonin receptor mechanism described in this vignette.

49. B. Local anesthetic systemic toxicity (LAST) occurs from inadvertent intravascular injection or systemic absorption of local anesthetic, producing the classic progression of perioral numbness, tinnitus, seizure, and cardiac arrhythmia, and is specifically treated with intravenous lipid emulsion therapy alongside standard resuscitation measures, matching this vignette's presentation and treatment precisely. This presentation (progressing from perioral numbness/tinnitus to seizure and arrhythmia after local anesthetic injection) is the classic pattern of LAST, not an IgE-mediated anaphylactic reaction, which would present differently (hives, angioedema, bronchospasm) and would not have lipid emulsion as its specific antidote. Malignant hyperthermia is a distinct, genetically mediated reaction to certain anesthetic triggers (not local anesthetic systemic toxicity), presenting with hyperthermia and muscle rigidity, and is treated with dantrolene, not lipid emulsion.

50. C. Liposomal bupivacaine encapsulates the local anesthetic in multivesicular lipid particles, allowing gradual release and extending its duration of local anesthetic effect to several days when infiltrated into a surgical site, matching this vignette's description of the specialized formulation and extended duration precisely. Standard unencapsulated bupivacaine provides a much shorter duration of action (hours, not days), which is precisely the limitation that the liposomal formulation described in this vignette is designed to overcome. A topical bupivacaine patch is applied to intact skin for localized surface analgesia, a different route and formulation from the surgical-site infiltration technique described in this vignette.

51. A. A lumbar sympathetic block targets the sympathetic chain anterior to the lumbar vertebral bodies (typically L2-L4), providing diagnostic and therapeutic value for lower extremity sympathetically maintained pain such as CRPS, matching this vignette's anatomic target and clinical indication precisely. A stellate ganglion block targets cervical sympathetic innervation for UPPER extremity sympathetic pain, an anatomically distinct target from the lower extremity indication described in this vignette. A celiac plexus block targets abdominal visceral sympathetic innervation, an entirely different anatomic region and indication from the lower extremity somatic sympathetic pain described in this vignette.

52. B. The ganglion impar is a small, unpaired sympathetic ganglion located anterior to the sacrococcygeal junction, and blocking it provides relief for coccydynia and other perineal/pelvic pain of

sympathetic origin, matching this vignette's anatomic target and clinical indication precisely. The stellate ganglion is located in the anterior cervical region for upper extremity sympathetic pain, an entirely different anatomic location from the sacrococcygeal target described in this vignette. The celiac plexus is located in the upper abdomen for visceral sympathetic pain, an entirely different anatomic location from the sacrococcygeal ganglion impar target described in this vignette.

53. B. An intercostal nerve block targets the neurovascular bundle running along the inferior border of a specific rib, providing focused analgesia for pain isolated to that single rib level, matching this vignette's targeted, single-level approach precisely. A thoracic paravertebral block targets the paravertebral space, typically providing broader multi-level segmental coverage rather than the single, targeted rib-level approach described in this vignette. A serratus anterior plane block targets a fascial plane over the lateral chest wall for broader anterolateral coverage, a different technique and target from the specific single-rib intercostal approach described in this vignette.

54. A. A corticosteroid/local anesthetic injection into the piriformis muscle provides both diagnostic confirmation (immediate relief supporting the piriformis as the pain source) and therapeutic anti-inflammatory benefit, serving a combined diagnostic-therapeutic purpose distinct from the longer-acting chemodenervation effect of botulinum toxin, matching this vignette's described purpose precisely. This is a reversible anti-inflammatory injection, not a permanent, irreversible neurolytic destruction technique, making this option's description of the injection's effect incorrect. There is no indication of an infectious process in this vignette (piriformis syndrome is a mechanical/compressive condition, not typically infectious), making an antibiotic-delivery purpose inconsistent with this scenario.

55. B. A hip joint intra-articular injection delivers local anesthetic and contrast directly into the joint capsule, and pain relief following the injection supports the joint itself (rather than surrounding soft tissue) as the pain generator, providing both diagnostic and therapeutic value, matching this vignette's description precisely. A trochanteric bursa injection targets the bursa outside the joint capsule, a different anatomic target used to evaluate a different potential pain source than the joint itself. A lumbar sympathetic block targets the sympathetic chain for lower extremity sympathetically maintained pain, an entirely different target and indication from the intra-articular hip joint injection described in this vignette.

56. A. Injecting directly into the glenohumeral joint space specifically targets intra-articular pathology such as osteoarthritis, distinct from extra-articular structures like the subacromial bursa/rotator cuff space, allowing more targeted treatment based on the suspected pain generator, matching this vignette's clinical reasoning precisely. The rotator cuff is an extra-articular structure located adjacent to, not within, the glenohumeral joint space itself, making a rotator cuff tear an inconsistent target for this specific intra-articular injection approach. Corticosteroid injections are intended for LOCAL, targeted anti-inflammatory effect at the injection site, not primarily for systemic effect throughout the entire body, making this option an inaccurate characterization of the injection's intended purpose.

57. B. Joint aspiration and corticosteroid injection are commonly and appropriately combined in the same procedure, allowing potential diagnostic analysis of the aspirated fluid (such as ruling out infection or crystal arthropathy) alongside therapeutic anti-inflammatory relief from the injected corticosteroid, matching this vignette's described combined approach precisely. This combined approach is common, appropriate, and routinely performed in clinical practice, directly contradicting a claim that aspiration and injection are never combined in the same encounter. Aspirating excess joint fluid before injection is generally considered beneficial, not harmful, to the subsequent corticosteroid's therapeutic effect, making a claim that it worsens the effect incorrect.

58. A. The trochanteric bursa, located between the greater trochanter and the overlying iliotibial band, is the specific target for injections addressing greater trochanteric pain syndrome, matching this vignette's anatomic location and clinical presentation (lateral hip pain, trochanteric tenderness, pain with side-lying) precisely. The hip joint capsule itself is a distinct, deeper structure from the more superficial trochanteric bursa targeted in this vignette, and intra-articular pathology would typically present with a different pain pattern than the greater trochanteric tenderness described here. The piriformis muscle is a distinct structure located more posteriorly and deeply, targeted for a different clinical syndrome (sciatic nerve irritation) than the lateral trochanteric bursa pathology described in this vignette.

59. C. A carpal tunnel corticosteroid injection aims to reduce local inflammation and swelling within the tunnel, relieving pressure on the adjacent median nerve, and is specifically performed to avoid direct intraneural injection (which would risk nerve injury), matching this vignette's described goal and technique precisely. The goal is symptomatic relief and inflammation reduction, not permanent destruction of the nerve, which would eliminate normal hand sensation and function rather than provide the intended therapeutic benefit. Direct intraneural injection is specifically AVOIDED, not the intended target, since injecting directly into the nerve risks significant nerve injury; the needle is placed adjacent to, not into, the median nerve.

60. C. De Quervain tenosynovitis specifically involves inflammation of the abductor pollicis longus and extensor pollicis brevis tendons within the first dorsal compartment, making targeted corticosteroid injection into that specific tendon sheath the appropriate and standard treatment approach, matching this vignette's diagnosis and treatment rationale precisely. The first dorsal compartment is precisely the anatomic structure affected in De Quervain tenosynovitis, directly contradicting a claim that it is unrelated to this condition. The standard target for this specific tendon-based condition is the first dorsal compartment tendon sheath, not the wrist joint capsule, which is a different structure relevant to different (joint-based) pathology.

61. B. Corticosteroid injection at the plantar fascia origin carries a recognized risk of plantar fascia rupture and heel fat pad atrophy, particularly with repeated injections at this weight-bearing location, which is an important risk to counsel patients about before proceeding, matching this vignette's clinical context precisely. There is no plausible anatomic mechanism by which a foot injection would cause hearing loss, an entirely unrelated body system and anatomic region from the injection site described in this vignette. There is no plausible mechanism by which an injection into one foot would cause a new

deformity in the OPPOSITE, uninjected foot, making this an implausible and unrelated risk to the procedure described.

62. A. A facet joint intra-articular injection delivers local anesthetic and contrast directly into the facet joint capsule itself, distinct from a medial branch block, which targets the small sensory nerves supplying the joint rather than the joint space itself, matching this vignette's described distinction precisely. Medial branch radiofrequency ablation targets the nerve supply for thermal lesioning after diagnostic blocks confirm the pain source, a different target and later-stage procedure from the direct intra-articular diagnostic injection described in this vignette. An epidural steroid injection targets the epidural space for radicular or central spinal pain, an entirely different anatomic target from the facet joint capsule described in this vignette.

63. A. Cement pulmonary embolism is a recognized, potentially serious complication of vertebral augmentation procedures in which injected cement enters the venous system and embolizes to the pulmonary vasculature, producing acute respiratory and cardiac symptoms, matching this vignette's presentation and mechanism precisely. A post-dural puncture headache is an entirely different complication related to inadvertent dural puncture during a needle-based spinal procedure, unrelated to cement embolization to the lungs. Local anesthetic systemic toxicity results from local anesthetic entering the bloodstream, an entirely different agent and mechanism from the bone cement embolization described in this vignette.

64. C. There are genuine, clinically relevant tradeoffs between spinal cord stimulator lead types: paddle leads require more invasive surgical placement (laminotomy) but offer greater positional stability, while percutaneous leads allow less invasive needle-based placement but may be more prone to migration, matching this vignette's described comparison and tradeoffs precisely. This vignette explicitly describes meaningful differences in placement technique, invasiveness, and stability between the two lead types, directly contradicting a claim that they are functionally and procedurally identical with no tradeoffs. Neither lead type is universally superior for all patients; the choice depends on individual patient factors and these specific tradeoffs, making a blanket claim of percutaneous lead superiority in every patient incorrect.

65. B. Spinal cord stimulation's approved clinical indications have expanded over time to include painful diabetic peripheral neuropathy refractory to pharmacologic management, in addition to its more traditional indications like failed back surgery syndrome and CRPS, matching this vignette's description of an evolving, expanding indication set precisely. This vignette explicitly describes an ADDITIONAL indication beyond failed back surgery syndrome, directly contradicting a claim that SCS has only ever been approved for a single indication. This vignette explicitly describes painful diabetic peripheral neuropathy as a studied, FDA-approved indication for SCS, directly contradicting a claim that it has never been studied as a potential indication.

66. B. Repetitive transcranial magnetic stimulation uses a magnetic coil placed against the scalp to deliver repeated pulses that induce electrical currents in targeted brain regions, entirely non-invasively

without needles, incisions, or anesthesia, matching this vignette's description of the technique precisely. Spinal cord stimulation requires an implanted epidural lead and generator, an entirely different, invasive modality from the non-invasive scalp-based technique described in this vignette. Deep brain stimulation requires invasive stereotactic surgical electrode placement within the brain itself, an entirely different, highly invasive modality from the non-invasive external technique described in this vignette.

67. A. Percutaneous electrical nerve stimulation (PENS) delivers electrical current through fine needle electrodes inserted near a peripheral nerve, differing from transcutaneous electrical nerve stimulation (TENS), which delivers current through surface skin electrode pads without needle insertion, matching this vignette's described technique and its distinction from a more common device precisely. Standard TENS specifically uses SURFACE skin electrode pads, not inserted needle electrodes, making this option's description of TENS incorrect and the opposite of its actual, non-invasive technique. Spinal cord stimulation requires a permanently implanted epidural electrode system, an entirely different, more invasive, and permanent modality from the temporary percutaneous needle-based technique described in this vignette.

68. C. An interspinous process spacer device is implanted between two adjacent spinous processes to maintain a flexed position, indirectly decompressing the spinal canal and relieving neurogenic claudication symptoms in appropriately selected patients with lumbar spinal stenosis, matching this vignette's description and mechanism precisely. A spinal cord stimulator paddle lead is an entirely different type of device, delivering electrical stimulation for pain modulation rather than providing mechanical spacing/decompression as described in this vignette. An intrathecal drug delivery pump is an entirely different type of device, delivering medication directly into the intrathecal space rather than providing mechanical spinal decompression as described in this vignette.

69. B. The minimally invasive lumbar decompression (MILD) procedure removes small pieces of thickened ligamentum flavum through a small percutaneous tubular instrument, without removing bone, to indirectly decompress the spinal canal in patients with lumbar spinal stenosis, matching this vignette's description and technique precisely. Open laminectomy is a more invasive surgical procedure involving bone (lamina) removal, a fundamentally different and more invasive approach from the percutaneous, bone-sparing MILD procedure described in this vignette. Percutaneous discectomy targets and removes disc material for a herniated disc, an entirely different target and indication from the ligamentum flavum removal for spinal stenosis described in this vignette.

70. A. Percutaneous cervical discectomy or nucleoplasty removes or ablates a portion of nucleus pulposus material through a small needle to decompress a contained cervical disc herniation, without open surgical exposure, matching this vignette's description and indication precisely. Cervical medial branch radiofrequency ablation targets facet joint innervation for facet-mediated pain, an entirely different target and indication from the disc herniation decompression described in this vignette. A cervical epidural steroid injection delivers anti-inflammatory medication into the epidural space, a different mechanism (medication delivery rather than mechanical disc decompression) from the procedure described in this vignette.

71. C. The splanchnic nerves, running along the anterolateral vertebral bodies at approximately T11-T12, can be targeted with radiofrequency ablation or neurolysis as an alternative or adjunctive approach to celiac plexus neurolysis for chronic pancreatitis or upper abdominal visceral pain, matching this vignette's description of the target and its distinction from the celiac plexus precisely. The lumbar sympathetic chain is located more caudally (L2-L4) and targets lower extremity sympathetic pain, an entirely different anatomic level and indication from the splanchnic nerve target described in this vignette. The stellate ganglion is located in the cervical region for upper extremity sympathetic pain, an entirely different anatomic location and indication from the thoracic splanchnic nerve target described in this vignette.

72. A. The superior cluneal nerves cross the posterior iliac crest and supply sensation to the upper buttock region, and entrapment or irritation of these nerves at the iliac crest is a recognized, often underrecognized cause of low back and buttock pain, matching this vignette's anatomic location and clinical presentation precisely. The pudendal nerves supply perineal sensation, an anatomically distinct region from the iliac crest/buttock distribution described in this vignette. The ilioinguinal nerves supply groin sensation, an anatomically distinct region from the posterior iliac crest/buttock distribution described in this vignette.

73. B. The middle cluneal nerves cross the posterior iliac crest at a more inferior and medial location near the sacroiliac region, and their entrapment is a distinct, recognized cause of low back and buttock pain that can mimic or coexist with sacroiliac joint pain, matching this vignette's described location precisely. The superior cluneal nerves cross more superiorly along the iliac crest, an anatomically distinct and more cephalad location from the inferior/medial location described in this vignette. The inferior cluneal nerves arise from the posterior femoral cutaneous nerve and supply the lower buttock, an anatomically distinct and more caudal distribution from the sacroiliac-adjacent location described in this vignette.

74. C. A continuous wound infiltration catheter is placed directly within the surgical wound and connected to a pump delivering ongoing local anesthetic infusion at the incision site, reducing postoperative pain and opioid requirements, matching this vignette's description and technique precisely. An epidural catheter is placed in the epidural space, an anatomically distinct location from the surgical wound itself, providing a different, broader mechanism of analgesia. A peripheral nerve catheter targets a specific named peripheral nerve, an anatomically distinct target from the wound itself, providing regional rather than local wound-site analgesia.

75. A. Hydrodissection uses injected fluid, such as saline or local anesthetic, specifically to mechanically separate an entrapped nerve from surrounding adherent scar tissue or fascia, providing symptomatic relief through mechanical release rather than a pharmacologic anti-inflammatory or neurolytic mechanism, matching this vignette's described technique and purpose precisely. Chemical neurolysis works through a fundamentally different, destructive mechanism (permanent chemical nerve destruction), which is the opposite of the mechanical separation and preservation of nerve function intended by hydrodissection as described in this vignette. Radiofrequency ablation works through

thermal energy to lesion nerve tissue, an entirely different, destructive mechanism from the mechanical fluid-based separation technique described in this vignette.

76. C. Percutaneous carpal tunnel release uses ultrasound guidance and a specialized needle-based device to divide the transverse carpal ligament without an open surgical incision, offering a minimally invasive alternative to traditional open or endoscopic surgical release, matching this vignette's description and stated goal precisely. Standard open carpal tunnel release requires a surgical incision, which is precisely what this vignette's patient wants to avoid, making it an inconsistent match for the described minimally invasive procedure. A corticosteroid injection provides anti-inflammatory relief without dividing the ligament, a fundamentally different mechanism and typically more temporary effect from the ligament-dividing procedure described in this vignette.

77. B. Botulinum toxin's chemodenervation effect can reduce muscle spasm and hyperactivity in affected paraspinal muscles, and this mechanism has been explored as a treatment approach for muscle-mediated chronic low back pain with significant myofascial trigger points, representing a legitimate, distinct application from its more established uses for migraine or piriformis syndrome, matching this vignette's description precisely. Botulinum toxin does have a plausible, mechanistically sound rationale for this muscle-focused application (chemodenervation of hyperactive muscle), directly contradicting a claim that it has no plausible mechanism for this indication. Botulinum toxin for this indication is injected directly into the affected paraspinal MUSCLES, not into the epidural space, which is an anatomically distinct target from the muscle-focused technique described in this vignette.

78. C. This scenario illustrates two distinct, recognized intrathecal pump-related complications: a pump pocket infection (suggested by fever and redness over the subcutaneous reservoir site) and a catheter fracture or disconnection (suggested by imaging findings and worsening pain control despite an intact, presumably still-functioning pump), matching this vignette's described findings precisely. Cement pulmonary embolism and post-dural puncture headache are complications of entirely different procedures (vertebral augmentation and dural puncture, respectively), unrelated to the implanted intrathecal pump complications described in this vignette. Opioid-induced hyperalgesia and constipation are pharmacologic side effects of opioid medication itself, not device-related mechanical or infectious complications of an implanted pump system as described in this vignette.

79. B. The axillary brachial plexus block targets the terminal nerve branches surrounding the axillary artery in the axilla, providing hand and distal upper extremity anesthesia while avoiding the risk of phrenic nerve involvement (and resultant hemidiaphragmatic paralysis) associated with more proximal approaches like the interscalene block, matching this vignette's description and stated rationale precisely. The interscalene block is the more PROXIMAL approach specifically associated with phrenic nerve involvement risk, which this vignette's patient is avoiding by choosing the axillary approach instead, making it the opposite of the correct answer. The adductor canal block targets the thigh for knee-related analgesia, an entirely different anatomic region from the upper extremity hand surgery described in this vignette.

80. B. The infraclavicular brachial plexus block targets the plexus cords as they travel beneath the clavicle and pectoralis minor muscle, providing reliable forearm and hand anesthesia at an anatomic level between the more proximal interscalene and more distal axillary approaches, matching this vignette's description and anatomic level precisely. The interscalene block is performed more proximally at the level of the scalene muscles in the neck, a different anatomic level from the infraclavicular cord-level approach described in this vignette. The axillary block is performed more distally at the terminal branch level in the axilla, a different anatomic level from the infraclavicular cord-level approach described in this vignette.

81. C. Progressive muscle relaxation, originally developed by Edmund Jacobson, involves systematically tensing and then releasing specific muscle groups in a defined sequence throughout the body, helping patients recognize and release physical tension, matching this vignette's description of the structured tense-then-release technique precisely. Diaphragmatic breathing focuses specifically on abdominal breath control, a related but mechanistically distinct relaxation technique from the muscle tense-and-release sequence described in this vignette. Guided imagery uses structured mental visualization of a calming scene, a cognitively focused technique distinct from the physical muscle tensing-and-releasing sequence described in this vignette.

82. A. Autogenic training uses silently repeated standardized self-suggestion phrases focused on body sensations (such as warmth and heaviness) to induce a physiological relaxation response, without the active muscle tensing used in progressive muscle relaxation, matching this vignette's description of the technique precisely. Progressive muscle relaxation specifically involves active tensing and releasing of muscle groups, which is explicitly different from the self-suggestion-based technique without active tensing described in this vignette. Cognitive restructuring targets distorted thought patterns through cognitive-behavioral techniques, an entirely different focus from the body-sensation-focused self-suggestion technique described in this vignette.

83. A. Neurofeedback uses real-time electroencephalographic (EEG) monitoring of brainwave activity, displayed to the patient, to train voluntary self-regulation toward target brainwave patterns associated with reduced pain and improved relaxation, matching this vignette's description of the technology and technique precisely. Standard biofeedback using surface EMG measures MUSCLE electrical activity rather than brainwave activity, a different physiologic signal and target from the EEG-based neurofeedback described in this vignette. TENS delivers electrical current TO the patient through skin electrodes for direct nerve stimulation, an entirely different technology from the signal-monitoring, self-regulation-training neurofeedback described in this vignette.

84. C. Virtual reality distraction therapy uses an immersive, interactive headset-based computer-generated environment to engage a patient's attention during a painful procedure, with research supporting meaningful reductions in reported procedural pain intensity, matching this vignette's description of the technology and its evidence base precisely. Standard guided imagery uses verbal guidance and mental visualization without any device or headset, a distinct, lower-technology approach from the immersive VR headset technique described in this vignette. Clinical hypnosis uses a trained

clinician's verbal suggestions during an induced relaxed state, a distinct technique without the immersive headset-based technology described in this vignette.

85. B. Aromatherapy uses essential oils, diffused or applied topically, for purposes including relaxation and anxiety reduction, but has a limited evidence base specifically for a direct analgesic effect on pain itself, matching this vignette's description and the physician's stated caveat precisely. Acupuncture involves needle insertion at specific points based on a meridian theoretical framework, an entirely different modality from the essential-oil-based technique described in this vignette. Osteopathic manipulative treatment is a hands-on manual therapy system involving physical techniques, an entirely different modality from the essential-oil-based aromatherapy described in this vignette.

86. C. Craniosacral therapy uses very light touch to the skull and sacrum, based on a claimed ability to detect and correct subtle rhythmic craniosacral movements, but its proposed mechanism lacks strong scientific support, matching this vignette's description and the physician's stated caveat precisely. Osteopathic manipulative treatment, while related historically, encompasses broader manual techniques with more established biomedical rationale for its soft-tissue components, distinct from the specific light-touch craniosacral technique and its more contested mechanism described in this vignette. Dry needling has a defined, evidence-based neuromuscular rationale (trigger point release via twitch response), a different mechanism and stronger evidence base from the craniosacral technique described in this vignette.

87. C. The Feldenkrais method uses slow, gentle, exploratory movements to increase a patient's awareness of habitual movement patterns and develop more efficient, less effortful ways of moving, rather than directly targeting strength or flexibility, matching this vignette's description of the method's goals and approach precisely. Standard core stabilization exercise directly targets trunk muscle strength, a fundamentally different goal from the movement-awareness focus of the Feldenkrais method described in this vignette. Aquatic therapy is performed in a water environment for reduced-impact exercise, a different setting and approach from the land-based, awareness-focused Feldenkrais technique described in this vignette.

88. B. The Alexander technique uses gentle hands-on guidance and verbal cues to help a patient recognize and release unnecessary muscular tension during everyday movements, emphasizing postural re-education rather than direct strengthening exercise, matching this vignette's description of the technique's focus and approach precisely. Standard physical therapy strengthening exercise directly targets specific muscle groups for strength gains, a fundamentally different focus from the postural awareness and tension-release emphasis of the Alexander technique described in this vignette. Trigger point dry needling uses needle insertion to release myofascial taut bands, an entirely different, procedural modality from the hands-on postural guidance technique described in this vignette.

89. A. Pilates is a structured exercise method emphasizing core strength, controlled breathing, precise movement, and body alignment, performed on a specialized mat or using resistance equipment with springs, developed originally as a distinct rehabilitation and conditioning system, matching this

vignette's description of the method and equipment precisely. Aquatic therapy is performed in a water environment rather than on a mat or specialized resistance equipment, a different setting and equipment from the Pilates method described in this vignette. Tai chi is a slow-movement mind-body practice rooted in Chinese martial arts tradition, a different origin, focus, and equipment set from the core-strength-and-alignment-focused Pilates method described in this vignette.

90. A. Nordic walking uses poles held in each hand during a structured walking program to engage the upper body and distribute load away from the lower extremities, providing a lower-impact aerobic exercise option for patients with conditions like hip osteoarthritis, matching this vignette's description of the equipment and mechanism precisely. Aquatic therapy is performed in a water environment, an entirely different setting from the land-based, pole-assisted walking program described in this vignette. The McKenzie method uses directional preference movement testing and exercise, a fundamentally different assessment-and-exercise approach from the pole-assisted aerobic walking program described in this vignette.

91. C. Emotional freedom technique, commonly called EFT tapping, involves tapping on specific acupressure-like points while verbally acknowledging distress, and it is recognized as lacking strong, rigorous supporting evidence despite being used by some patients for emotional distress, matching this vignette's description and the physician's stated caveat precisely. Clinical hypnosis uses a trained clinician's verbal suggestion during an induced relaxed state, an entirely different technique from the self-administered tapping technique described in this vignette. Cognitive behavioral therapy uses structured, evidence-based cognitive and behavioral techniques, a well-established approach distinct from the limited-evidence tapping technique described in this vignette.

92. B. Art therapy uses guided visual artistic expression, facilitated by a trained therapist, as a means of expressing and processing difficult emotions related to a patient's pain experience, rather than to develop artistic skill, matching this vignette's description of the therapy's purpose and format precisely. Music therapy uses structured musical engagement rather than visual artistic creation, a different creative modality from the drawing/painting/sculpture-based technique described in this vignette. Guided imagery uses verbally guided mental visualization without any physical creative activity, an entirely different, non-creative-production technique from the hands-on artistic expression described in this vignette.

93. B. Expressive writing, or structured journaling intervention, involves writing for a set duration on consecutive days about deep thoughts and feelings related to a stressful or traumatic experience, and has been studied for potential benefit on both physical and psychological outcomes in chronic illness populations, matching this vignette's description of the structured protocol precisely. Cognitive restructuring is a therapist-guided technique targeting specific distorted thoughts through dialogue, a different format and process from the independent, structured writing intervention described in this vignette. Motivational interviewing is a patient-centered communication technique exploring ambivalence about behavior change, an entirely different format and purpose from the independent expressive writing intervention described in this vignette.

94. A. Solution-focused brief therapy emphasizes identifying existing strengths, exceptions to the problem, and concrete, achievable future goals, rather than extensively exploring the origins or history of a patient's difficulties, matching this vignette's description of the therapeutic focus and approach precisely. Psychodynamic psychotherapy specifically emphasizes extensive exploration of unconscious conflicts and past experiences, which is the opposite focus from the future-and-strengths-oriented approach described in this vignette. Dialectical behavior therapy specifically emphasizes distress tolerance and emotion regulation skills training, a different specific focus from the strengths-and-goals-oriented solution-focused approach described in this vignette.

95. B. Interpersonal therapy is a time-limited, structured psychotherapy specifically focused on improving interpersonal relationships and social functioning as a pathway to addressing depression, making it well-suited for a patient whose depression is closely tied to relationship strain and role changes, matching this vignette's clinical presentation and treatment rationale precisely. Cognitive behavioral therapy primarily focuses on restructuring distorted thoughts and beliefs, a different therapeutic mechanism from the interpersonal-relationship focus specifically described in this vignette. Acceptance and commitment therapy focuses on psychological flexibility and values-based action, a different therapeutic mechanism from the specific interpersonal-relationship focus described in this vignette.

96. A. Contingency management uses a structured system of rewards (tokens or privileges) contingent on specific target behaviors, reinforcing those behaviors over time, which is exactly the behavioral principle applied in this vignette's token-and-privilege system for healthy coping and school attendance. Systematic desensitization uses graded exposure to reduce a specific fear response, a different behavioral technique from the reward-based reinforcement system described in this vignette. Cognitive restructuring targets distorted thought patterns directly rather than using a structured behavioral reward system, making it a different type of intervention from the contingency-based approach described in this vignette.

97. C. Ice massage combines a cooling cryotherapy effect with light mechanical massage by rubbing ice directly over a localized area, distinct from a static ice pack, and is used as an adjunct treatment for acute localized muscle soreness, matching this vignette's description of the technique and its dual mechanism precisely. Standard TENS uses electrical stimulation through skin electrodes, an entirely different modality from the cold-and-massage technique described in this vignette. Diathermy uses deep heating through electromagnetic energy, the opposite thermal effect from the cooling technique described in this vignette.

98. C. Kinesiology taping uses elastic, adhesive tape applied in specific patterns, claimed by proponents to lift the skin slightly and improve circulation, though rigorous evidence for a mechanism beyond a possible placebo or proprioceptive effect remains limited, matching this vignette's description and the noted evidence limitation precisely. Standard rigid athletic taping is designed specifically to RESTRICT joint range of motion for injury protection, a different material property and mechanism from the elastic, non-restrictive kinesiology tape described in this vignette. Osteopathic manipulative treatment is a

hands-on manual therapy system, an entirely different modality from the adhesive tape application technique described in this vignette.

99. A. Pain neuroscience education specifically teaches patients about the biology and neuroscience of pain processing, including how chronic pain can persist independent of ongoing tissue damage, with the goal of reducing fear, catastrophizing, and pain-related disability while supporting engagement in active treatment, matching this vignette's description and stated goal precisely. Standard informed consent discussion is focused specifically on the risks, benefits, and alternatives of a particular planned procedure, a narrower and different purpose from the broader pain-biology education described in this vignette. Motivational interviewing is a communication technique exploring ambivalence about behavior change, a different format and purpose from the educational content delivery described in this vignette.

100. A. Telehealth-delivered psychotherapy, including structured, evidence-based approaches like CBT, can extend access to psychological treatment for chronic pain patients facing geographic or access barriers to in-person mental health specialty care, matching this vignette's described delivery model and its access-related benefit precisely. Video-conferencing-delivered psychotherapy has evidence supporting meaningful effectiveness for many patients and conditions, directly contradicting a blanket claim that it is entirely ineffective compared to in-person delivery in all circumstances. This vignette explicitly describes STRUCTURED CBT being delivered via telehealth, directly contradicting a claim that telehealth psychotherapy is restricted exclusively to supportive counseling and cannot include structured evidence-based approaches.

101. C. Breakthrough pain is specifically defined as a transient flare of pain that exceeds otherwise well-controlled baseline (background) pain, occurring despite an effective around-the-clock regimen, matching this vignette's description of the sudden, transient pain flare precisely. Nociplastic pain is a mechanistic taxonomic category describing altered nociception without clear tissue damage, a different concept from the transient flare-versus-baseline distinction described in this vignette. Chronic primary pain describes a persistent pain condition considered a diagnosis in its own right, not the transient flare phenomenon relative to a controlled baseline described in this vignette.

102. B. Acute-on-chronic pain describes a new, distinct acute pain process (such as a new injury) superimposed on a preexisting chronic pain condition, requiring evaluation for the new acute component rather than simply attributing the change to the underlying chronic condition, matching this vignette's described scenario precisely. Nociplastic pain describes a specific mechanistic category of pain from altered central processing without clear tissue injury, not the superimposed-new-injury concept illustrated in this vignette. Breakthrough pain specifically describes a transient flare in a patient on an otherwise well-controlled opioid regimen for a known baseline pain condition, a related but distinct concept from the new-injury-on-chronic-condition scenario described in this vignette.

103. B. Fibromyalgia diagnostic criteria have evolved meaningfully since 1990, moving away from a physical tender point count toward symptom-based criteria incorporating a widespread pain index and

symptom severity score, reflecting evolving understanding of the condition, matching this vignette's described historical evolution precisely. This vignette explicitly describes a REVISION away from the original 1990 tender point criteria, directly contradicting a claim that the criteria have never changed and remain identical to the original version. The 2016 criteria specifically REMOVED the physical tender point count requirement rather than expanding it, directly contradicting a claim that the 2016 version reintroduced a more extensive tender point examination requirement.

104. C. Because fibromyalgia's pathophysiology is centered on central sensitization and nociplastic mechanisms rather than ongoing peripheral tissue damage that opioids are best suited to address, opioids generally provide limited benefit while carrying disproportionate risk in this population, favoring a multimodal, non-opioid-centered treatment approach, matching this vignette's description and its underlying rationale precisely. Opioids are specifically NOT recommended as first-line or primary therapy for fibromyalgia given the mechanistic mismatch and unfavorable risk-benefit profile described in this vignette, directly contradicting a claim that they are the most effective first-line treatment. Fibromyalgia does have an increasingly well-characterized pathophysiologic basis centered on central sensitization, which is precisely what informs the multimodal, non-opioid-centered treatment rationale described in this vignette, making a claim of no established pathophysiologic basis incorrect.

105. A. Prehospital analgesia, using agents like intranasal fentanyl or intramuscular ketamine, reflects the recognition that significant traumatic pain can and should be addressed by trained EMS personnel before hospital arrival, improving patient comfort and potentially reducing downstream complications like chronic pain development, matching this vignette's described practice and its rationale precisely. Prehospital analgesia is an actively used, evidence-supported, and increasingly emphasized practice in modern EMS protocols, not an abandoned or prohibited one, making this option factually incorrect. Prehospital analgesia is used across both adult and pediatric trauma populations when clinically appropriate, not exclusively reserved for pediatric patients, making this option's restriction inaccurate.

106. C. Burn pain has recognized distinct components -- a background pain level and a separate, typically more intense procedural pain during activities like dressing changes -- and effective management requires separately timed analgesic dosing specifically to cover that anticipated procedural pain spike, matching this vignette's described approach and its underlying rationale precisely. This vignette explicitly describes procedural dressing-change pain as distinctly HIGHER than background pain, requiring separate management, directly contradicting a claim that the two pain types are identical and require no separate approach. Expecting a patient to tolerate significant procedural pain during dressing changes without additional analgesia is inconsistent with appropriate burn pain management standards and with this vignette's description of providing separately timed procedural dosing.

107. B. A hematoma block involves injecting local anesthetic directly into the accumulated blood clot (hematoma) at a fracture site, providing localized analgesia sufficient for fracture reduction without requiring systemic sedation, matching this vignette's description of the technique and its injection site precisely. A standard peripheral nerve block targets a specific named nerve proximal to the injury site, an anatomically distinct technique and target from the direct intra-fracture-site injection described in this

vignette. Procedural sedation with IV ketamine provides systemic dissociative anesthesia, which this vignette's patient specifically avoided by using the more localized hematoma block technique instead.

108. B. Sedation for pediatric MRI is primarily used to ensure the child remains motionless for adequate image quality and to reduce distress from the enclosed, noisy scanner environment, rather than to treat pain, since MRI itself is not an inherently painful procedure, matching this vignette's description and stated purpose precisely. MRI itself does not cause significant physical pain (it is a non-invasive imaging modality), directly contradicting a claim that this sedation is provided as analgesia for an inherently painful procedure. A single sedation session for one imaging study does not treat or permanently alter an underlying anxiety disorder; it addresses only the immediate need for motion control and distress reduction during that specific procedure.

109. C. Postoperative nausea and vomiting management is an important, interconnected component of overall postoperative recovery, and opioid-sparing multimodal analgesia serves a dual role in reducing both pain and opioid-related nausea, reflecting the interconnected nature of these postoperative symptoms, matching this vignette's described approach and rationale precisely. This vignette explicitly describes opioids as CONTRIBUTING to nausea, directly establishing a relationship between opioid use and postoperative nausea, contradicting a claim that no such relationship exists. This vignette explicitly describes PROPHYLACTIC (preoperative or early) antiemetic administration as part of a risk-stratified approach, directly contradicting a claim that antiemetic prophylaxis is never indicated before nausea develops.

110. A. Peripheral nerve blocks can occasionally fail partially or completely even when properly performed, and having a rescue analgesia plan (supplemental local infiltration, systemic analgesia, or conversion to general anesthesia) ready is an important, recognized aspect of safe regional anesthesia practice, matching this vignette's described scenario and clinical decision-making precisely. Even ultrasound-guided blocks can occasionally have incomplete or failed coverage due to anatomic variation or technical factors, so claiming blocks never fail and rescue planning is entirely unnecessary is incorrect and represents an unsafe assumption. This vignette explicitly lists MULTIPLE rescue options (local infiltration, systemic analgesia, or conversion to general anesthesia), directly contradicting a claim that immediate general anesthesia conversion is the only available option for a patchy block.

111. C. Labor epidural analgesia uses a catheter placed in the epidural space for continuous infusion of local anesthetic (often combined with an opioid), providing effective, adjustable pain relief throughout labor while generally preserving the ability to push, matching this vignette's description of the technique and its clinical goals precisely. A spinal (intrathecal) block is typically a single-injection technique providing denser anesthesia, more commonly used for cesarean delivery rather than continuous labor analgesia, making it a different technique from the one described in this vignette. A pudendal nerve block provides more limited perineal analgesia for the later stages of labor and delivery specifically, not the continuous, catheter-based analgesia throughout labor described in this vignette.

112. A. Opioids, particularly at higher cumulative doses, can contribute to postoperative delirium risk in vulnerable elderly patients, so multimodal, opioid-sparing analgesic protocols may help reduce this risk by minimizing opioid exposure while still providing adequate pain control, matching this vignette's described rationale precisely. Opioid exposure is a recognized, clinically significant contributing factor to postoperative delirium risk in vulnerable populations, directly contradicting a claim that no such relationship exists in any patient population. While cost may be a secondary consideration in some contexts, the primary, clinically emphasized rationale for this approach in elderly patients is delirium risk reduction, not cost alone, making a purely cost-based explanation an incomplete and inaccurate characterization.

113. C. A multimodal, opioid-sparing approach combining local anesthetic nerve blocks with scheduled non-opioid analgesics (NSAIDs and acetaminophen) is appropriate and often sufficient for managing dental and oral surgical pain, with opioids reserved for cases where this regimen proves inadequate, matching this vignette's described approach and its underlying appropriateness precisely. This vignette explicitly describes effective pain management using LOCAL anesthesia (nerve blocks) rather than general anesthesia, directly contradicting a claim that dental/oral surgical pain requires general anesthesia in every case. Scheduled NSAIDs and acetaminophen have well-established, meaningful efficacy for dental and oral surgical pain and are frequently sufficient alone, directly contradicting a claim that they have no meaningful role in this context.

114. B. Superficial sunburn without blistering is generally recognized as a self-limited, minor injury that can be effectively managed with simple measures including cool compresses, topical care, and over-the-counter oral NSAIDs, without requiring the intensive care needed for deeper or more extensive burns, matching this vignette's description and management approach precisely. This vignette specifically illustrates a MINOR, superficial burn managed with simple measures, directly contradicting a claim that all burns regardless of depth require the same intensive management approach used for major burns. This vignette explicitly describes effective management using over-the-counter NSAIDs alone, directly contradicting a claim that sunburn pain can only be effectively managed with prescription-strength opioids.

115. A. Non-pharmacologic distraction techniques, such as bubble blowing, video watching, or guided imagery, can be an effective, evidence-supported, appropriate first-line approach for managing procedural anxiety and pain perception during minor pediatric procedures like blood draws, avoiding the need for pharmacologic sedation in most cases, matching this vignette's description and its clinical appropriateness precisely. Distraction techniques have a genuine, evidence-supported benefit for reducing pediatric procedural distress and pain perception, directly contradicting a claim that no such evidence exists. This vignette explicitly demonstrates a minor procedure being effectively managed WITHOUT pharmacologic sedation, using behavioral distraction alone, directly contradicting a claim that every pediatric procedure requires pharmacologic sedation regardless of how minor.

116. B. Inadequately controlled thoracic surgical pain can directly impair a patient's ability to take deep breaths, cough effectively, and use an incentive spirometer, which increases the risk of pulmonary

complications like atelectasis and pneumonia, making effective analgesia an important component of pulmonary complication prevention, matching this vignette's described scenario and its clinical significance precisely. This vignette explicitly describes pain-related shallow breathing and spirometer avoidance leading to pulmonary complication concern, directly demonstrating a meaningful relationship between pain control and pulmonary toilet ability, contradicting a claim of no relationship. Incentive spirometry is a standard, important component of postoperative pulmonary care specifically relevant after THORACIC surgery (as well as abdominal surgery), directly contradicting a claim that it has no application after thoracic surgery.

117. A. An acute pain flare in a patient with underlying chronic pancreatitis warrants both symptomatic multimodal pain management (including appropriate opioid use for a severe acute flare) and evaluation for a new, superimposed acute complication such as a pseudocyst or duct obstruction, rather than assuming the flare is simply a routine exacerbation, matching this vignette's described comprehensive approach precisely. This vignette explicitly describes appropriate IV opioid use as part of the acute flare management, directly contradicting a claim that opioids should never be used under any circumstances for this indication. This vignette explicitly describes evaluating for a superimposed acute complication (pseudocyst, duct obstruction) rather than just escalating baseline analgesic dosing, directly contradicting a claim that no additional diagnostic workup is ever warranted.

118. A. Quadriceps tendon rupture occurs from sudden forceful contraction against resistance, producing a palpable gap just above the patella and loss of active knee extension, matching this vignette's mechanism, exam finding, and functional loss precisely. Patellar tendinopathy is a chronic, gradual degenerative overuse condition without the sudden rupture, palpable gap, or acute loss of extension described in this vignette. Pes anserine bursitis produces tenderness below the medial joint line, an anatomically distinct location from the suprapatellar defect described in this vignette.

119. B. Calcific tendinitis results from an acute inflammatory reaction to a discrete calcium deposit within a rotator cuff tendon (commonly the supraspinatus), producing sudden, severe shoulder pain distinct from the gradual onset typical of chronic degenerative tendinopathy, matching this vignette's presentation and imaging finding precisely. Adhesive capsulitis has a gradual, progressive onset with global motion restriction, the opposite presentation pattern from the sudden, acute severe pain described in this vignette. A SLAP lesion involves the superior glenoid labrum, an anatomically distinct structure from the calcium deposit within the tendon itself described in this vignette.

120. A. A biceps tendon rupture, typically of the long head, produces a sudden pop, bruising, and the characteristic "Popeye" deformity from proximal retraction of the unopposed biceps muscle belly, along with weakness in forearm supination, matching this vignette's presentation and classic deformity precisely. Biceps tendinopathy is a chronic, gradual degenerative overuse condition without the sudden rupture, deformity, and acute mechanism described in this vignette. Adhesive capsulitis produces gradual, global shoulder motion restriction, not the sudden rupture and characteristic arm deformity described in this vignette.

121. B. Olecranon bursitis results in a fluid collection within the bursa overlying the olecranon process at the tip of the elbow, producing a soft, fluctuant swelling that is often minimally tender and does not significantly limit elbow motion, matching this vignette's presentation and location precisely. Lateral epicondylitis produces pain localized to the outer (lateral) elbow with resisted wrist extension, not the swelling directly over the tip of the elbow described in this vignette. Cubital tunnel syndrome produces numbness and tingling in an ulnar nerve distribution (ring and little fingers) rather than a visible swelling at the elbow tip, making it an inconsistent match for this vignette's presentation.

122. C. The ulnar collateral ligament is commonly injured in overhead throwing athletes from repetitive valgus stress during the throwing motion, particularly during the late cocking and acceleration phases, producing medial elbow pain and instability on valgus stress testing, matching this vignette's presentation, mechanism, and exam finding precisely. The lateral collateral ligament is an uncommon site of throwing-related injury and would not be expected to produce the medial-sided pain and valgus instability described in this vignette. The common extensor tendon origin is associated with lateral epicondylitis and lateral elbow pain, an anatomically distinct location from the medial elbow pain and valgus instability described in this vignette.

123. B. Chronic ankle instability results from residual ligamentous laxity and impaired proprioception following repeated ankle sprains, producing a persistent "giving way" sensation and functional instability well after the original injury has healed, matching this vignette's history, exam finding, and functional complaint precisely. An acute lateral ankle sprain describes a single new injury event, not the longstanding, recurrent functional instability well after healing that is described in this vignette. Achilles tendon rupture produces a sudden posterior ankle injury with plantarflexion weakness, an entirely different presentation and mechanism from the chronic inversion instability described in this vignette.

124. C. Boutonniere deformity results from disruption of the central slip of the extensor tendon at the PIP joint, causing the characteristic combination of PIP joint flexion with compensatory DIP joint hyperextension, matching this vignette's specific deformity pattern and mechanism precisely. Trigger finger results from a flexor tendon nodule causing catching and locking during active flexion and extension, a different mechanism and clinical picture from the fixed extensor deformity described in this vignette. Dupuytren's contracture results from palmar fascia thickening causing progressive finger flexion contracture, a different tissue and mechanism from the extensor tendon disruption described in this vignette.

125. A. A scaphoid fracture is classically suspected with anatomic snuffbox tenderness after a fall onto an outstretched hand, and it can be radiographically occult on initial X-ray, requiring immobilization and repeat imaging or advanced imaging given the risk of avascular necrosis if missed, matching this vignette's presentation and clinical management precisely. A distal radius fracture is typically visible on initial X-ray, without the diagnostic uncertainty and occult-fracture concern that specifically drives this vignette's management approach for the scaphoid. De Quervain tenosynovitis is a tendon inflammatory condition, not a fracture, and would not be the primary concern prompting immobilization and repeat imaging after an acute fall as described in this vignette.

126. A. A Colles' fracture is a distal radius fracture with dorsal displacement/angulation, classically producing the visible "dinner fork" deformity after a fall onto an outstretched hand, particularly in elderly patients with osteoporotic bone, matching this vignette's mechanism, presentation, and deformity precisely. A scaphoid fracture typically does not produce a visible gross deformity, presenting instead with more subtle snuffbox tenderness, distinct from the obvious dinner fork deformity described in this vignette. A boxer's fracture involves the fifth metacarpal neck from a punching mechanism, an anatomically distinct fracture location and mechanism from the distal radius fall injury described in this vignette.

127. B. Turf toe is an acute sprain of the first metatarsophalangeal joint's plantar capsuloligamentous complex, classically resulting from forced hyperextension of the great toe during activities like kicking or pushing off, matching this vignette's mechanism, location, and injury type precisely. Hallux valgus is a chronic, progressive structural deformity developing over time, not the acute traumatic sprain from a single forceful hyperextension event described in this vignette. Morton's neuroma involves the interdigital nerve between the toes, an entirely different structure and mechanism from the first MTP joint ligament sprain described in this vignette.

128. C. Femoroacetabular impingement results from abnormal contact between the femoral head-neck junction and the acetabular rim during hip flexion, a structural abnormality that predisposes to labral tears and early osteoarthritis, matching this vignette's presentation, imaging finding, and clinical significance precisely. Osteitis pubis involves inflammation and pain at the pubic symphysis, an anatomically distinct structure from the femoral head-neck/acetabular rim abnormality described in this vignette. Meralgia paresthetica is a nerve entrapment syndrome producing numbness, an entirely different pathophysiology from the bony structural impingement abnormality described in this vignette.

129. C. Osteitis pubis is an inflammatory overuse condition localized specifically to the pubic symphysis, common in athletes performing repetitive kicking and cutting movements, producing activity-related pain directly at the symphysis with characteristic imaging findings, matching this vignette's presentation and imaging description precisely. Femoroacetabular impingement involves the hip joint itself (femoral head-neck junction and acetabular rim), an anatomically distinct location from the pubic symphysis pathology described in this vignette. A hip labral tear involves the acetabular labrum within the hip joint, an anatomically distinct structure from the pubic symphysis inflammation described in this vignette.

130. A. A sports hernia, or athletic pubalgia, involves a tear or weakness in the lower abdominal wall musculature/tendon complex near its pubic insertion, producing activity-related groin and lower abdominal pain without a palpable true hernia defect on exam, matching this vignette's presentation and diagnostic findings precisely. Osteitis pubis is a bone-level inflammatory condition at the pubic symphysis itself, a different tissue type and structure from the soft tissue muscular/tendon injury described in this vignette (though the two conditions can coexist or be difficult to distinguish clinically). A standard inguinal hernia would be expected to show a palpable bulge or defect on physical

examination, which this vignette explicitly states is absent, making it an inconsistent diagnosis for this presentation.

131. B. Pes anserine bursitis produces tenderness at the pes anserine bursa, located below the medial joint line at the conjoined insertion of the sartorius, gracilis, and semitendinosus tendons, distinct from joint-line tenderness itself, and is a common source of medial knee pain particularly in patients with osteoarthritis, matching this vignette's specific tenderness location precisely. A medial collateral ligament sprain produces tenderness directly at the joint line where the ligament crosses, a different, more proximal location from the pes anserine bursa tenderness described in this vignette. A Baker's cyst produces posterior knee swelling, an anatomically distinct location from the medial, below-joint-line tenderness described in this vignette.

132. B. The medial collateral ligament is injured by a valgus (inward) stress mechanism, producing medial knee pain and laxity specifically on valgus stress testing, matching this vignette's mechanism and positive exam finding precisely. This vignette explicitly states the Lachman test (which evaluates the ACL) is negative, directly ruling out the anterior cruciate ligament as the injured structure in this scenario. The lateral meniscus would be assessed with the McMurray test involving rotational stress, not the valgus stress test described as positive in this vignette, making it an inconsistent match for the described exam finding.

133. A. Patellar tendinopathy, commonly called "jumper's knee," results from repetitive jumping loads causing degenerative changes at the patellar tendon origin (inferior pole of the patella), producing focal pain at that specific location worsened by jumping and landing, matching this vignette's presentation and imaging finding precisely. Patellofemoral pain syndrome produces more diffuse anterior knee pain related to patellar tracking abnormalities, not the focal tendon degeneration at the inferior pole described in this vignette. Iliotibial band syndrome produces lateral knee pain from friction over the lateral femoral epicondyle, an anatomically distinct location from the inferior patellar tendon pain described in this vignette.

134. C. Little league shoulder, or proximal humeral epiphysiolysis, results from repetitive rotational stress on the still-open proximal humeral growth plate during the throwing motion, producing gradual shoulder pain and characteristic growth plate widening on imaging without an acute fracture, matching this vignette's age group, mechanism, and imaging finding precisely. A SLAP lesion is a labral tear typically seen in skeletally mature athletes with closed growth plates, a different structure and skeletal maturity context from the open growth plate injury described in this vignette. Adhesive capsulitis produces global restriction of both active and passive shoulder motion from capsular contracture, an entirely different mechanism from the growth plate stress injury described in this vignette.

135. C. Sever's disease, or calcaneal apophysitis, results from traction-related irritation of the growth plate at the heel in growing, active children, producing heel pain with compression tenderness, particularly during growth spurts with running and jumping activity, matching this vignette's age, presentation, and mechanism precisely. Plantar fasciitis is much more common in adults and classically

presents with first-step morning pain, a different age group and pain pattern from the pediatric growth-related condition described in this vignette. An Achilles tendon rupture is an acute traumatic injury with a sudden onset, not the gradual, activity-related pain during a growth spurt described in this vignette, and this vignette explicitly states there is no significant trauma history.

136. B. A lateral ankle sprain results from an inversion mechanism, most commonly injuring the anterior talofibular ligament (the first and most commonly injured component of the lateral ligament complex), producing lateral ankle pain, swelling, and difficulty bearing weight, matching this vignette's mechanism, presentation, and tenderness location precisely. Posterior tibial tendon dysfunction is a chronic, gradual overuse condition affecting the medial ankle, not the acute inversion injury to the lateral ligament complex described in this vignette. An Achilles tendon rupture involves the posterior ankle/heel structure, an anatomically distinct location from the lateral ligament injury described in this vignette.

137. A. An Achilles tendon rupture classically produces a sudden "kicked from behind" sensation, immediate difficulty walking, plantarflexion weakness, and a palpable gap in the tendon just above its calcaneal insertion, matching this vignette's presentation, mechanism, and exam finding precisely. Achilles tendinopathy is a chronic, gradual degenerative condition without the sudden rupture mechanism, palpable gap, or acute weakness described in this vignette. Sever's disease is a pediatric heel growth plate condition, an entirely different age group, mechanism, and pathology from the adult acute tendon rupture described in this vignette.

138. C. Posterior tibial tendon dysfunction is a gradual, progressive degenerative condition of the posterior tibial tendon, leading to progressive collapse of the medial longitudinal arch (adult acquired flatfoot), medial ankle pain and swelling, and impaired ability to perform a single-leg heel raise, matching this vignette's presentation and progression precisely. A lateral ankle sprain is an acute injury from an inversion mechanism, an entirely different mechanism and time course from the gradual degenerative process described in this vignette. Plantar fasciitis produces heel pain rather than the medial ankle pain and progressive arch collapse described in this vignette, making it an inconsistent match for this presentation.

139. C. Spondylolysis is a stress fracture of the pars interarticularis without associated vertebral slippage, distinct from spondylolisthesis, which specifically involves actual forward slippage of one vertebral body on another and can develop as a later progression from spondylolysis, matching this vignette's imaging finding and the distinction being tested precisely. Spondylolisthesis specifically requires actual vertebral slippage to be present by definition, which this vignette's imaging explicitly does NOT show, making it an inconsistent diagnosis for the pars fracture without slippage described here. Facet joint arthropathy is a degenerative condition of the facet joints, a different structure and mechanism from the pars interarticularis stress fracture described in this vignette.

140. A. Scheuermann's kyphosis is a structural form of adolescent kyphosis characterized by wedging of several consecutive thoracic vertebral bodies on imaging, distinguishing it from simple postural

kyphosis, and it commonly presents with a gradually worsening rounded back appearance and mild pain, matching this vignette's presentation and imaging finding precisely. Adult degenerative scoliosis is a lateral curvature condition occurring in older adults from age-related degeneration, an entirely different age group, curve direction, and mechanism from the adolescent structural kyphosis described in this vignette. Ankylosing spondylitis is an inflammatory spondyloarthropathy with a different mechanism (inflammatory fusion) and typically different imaging findings (sacroiliac erosion, bamboo spine) from the vertebral body wedging described in this vignette.

141. B. Slipping rib syndrome results from hypermobility of the lower rib cartilaginous attachments, producing a clicking or slipping sensation and pain reproduced by the classic "hooking maneuver" (examiner's fingers hooked under the rib margin, pulling anteriorly), matching this vignette's presentation and specific provocative exam finding precisely. Costochondritis produces tenderness directly at the costochondral junction with palpation, not the specific hooking/slipping maneuver finding described in this vignette, making it a distinct clinical entity with a different diagnostic exam technique. Osteitis pubis involves the pubic symphysis, an entirely different anatomic region from the rib margin pathology described in this vignette.

142. C. Legg-Calve-Perthes disease is an idiopathic avascular necrosis of the femoral head epiphysis occurring in young children (typically ages 4 to 8), producing a limp and hip/groin pain with characteristic flattening and fragmentation on imaging, without the adult risk factors like corticosteroid use, matching this vignette's age group, presentation, and imaging finding precisely. Femoroacetabular impingement is a structural bony contact abnormality between the femoral head-neck junction and acetabulum, a mechanically distinct process from the blood-supply-related epiphyseal necrosis described in this vignette. Slipped capital femoral epiphysis involves displacement of the femoral epiphysis through the growth plate, a different mechanism (mechanical slippage) from the avascular fragmentation process described in this vignette, and it typically affects an older adolescent age group.

143. C. Malignant psoas syndrome results from tumor infiltration of the psoas muscle, compressing the femoral nerve that travels within it, producing groin and anterior thigh pain with hip flexion weakness, matching this vignette's presentation, imaging finding, and mechanism precisely. Malignant brachial plexopathy involves the upper extremity nerve plexus from tumor invasion in the chest/axilla region, an anatomically distinct location from the lower extremity psoas/femoral nerve involvement described in this vignette. Postmastectomy pain syndrome is a chronic neuropathic pain condition following breast cancer surgery, an entirely unrelated syndrome and mechanism from the psoas muscle tumor infiltration described in this vignette.

144. A. Multiple myeloma produces diffuse osteoclast activation through cytokine signaling from myeloma cells within the bone marrow, resulting in widespread lytic bone destruction ("punched-out" lesions) and associated diffuse bony pain throughout the involved skeleton, matching this vignette's presentation and imaging finding precisely. Multiple myeloma is a hematologic malignancy producing diffuse, multifocal skeletal involvement, not a single isolated metastasis from a solid tumor, which would typically produce more localized rather than diffuse pain. Osteitis pubis is a localized

inflammatory condition of the pubic symphysis, an entirely different, non-malignant process from the diffuse myeloma-related skeletal lytic disease described in this vignette.

145. A. Tumor lysis syndrome results from massive tumor cell breakdown after initiating chemotherapy for a rapidly proliferating malignancy, releasing intracellular contents and producing characteristic metabolic derangements including hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia, along with associated pain, matching this vignette's timeline, laboratory findings, and mechanism precisely. Hypercalcemia of malignancy would produce an ELEVATED, not decreased, calcium level, which is the opposite laboratory finding from the hypocalcemia explicitly described in this vignette, making it an inconsistent diagnosis. Superior vena cava syndrome is a vascular compression syndrome producing facial/arm swelling, an entirely different mechanism and presentation from the metabolic emergency with characteristic laboratory derangements described in this vignette.

146. B. Malignancy is well recognized to be associated with an increased risk of venous thromboembolism, including deep vein thrombosis and pulmonary embolism, related to a cancer-associated prothrombotic (hypercoagulable) state, making this a common and clinically significant complication requiring vigilance and often prophylaxis, matching this vignette's presentation and its clinical significance precisely. Cancer has a well-established, significantly increased association with venous thromboembolism risk compared to the general population, directly contradicting a claim that no such association exists. While direct tumor invasion of a vein can occasionally contribute to thrombosis, the primary and much more common mechanism in cancer-associated thrombosis is a systemic prothrombotic state from tumor-related factors, not exclusively direct venous invasion by the tumor itself.

147. B. Chemotherapy extravasation occurs when a vesicant chemotherapy agent leaks from the vein into surrounding tissue, potentially causing significant local tissue damage including necrosis if not promptly recognized and managed with specific extravasation protocols, matching this vignette's presentation and the clinical urgency described precisely. Progressive pain, swelling, and redness at an infusion site during vesicant chemotherapy administration is NOT a typical, expected, no-action finding; it is a recognized complication requiring immediate intervention, making this option incorrect. This presentation (localized pain, swelling, redness at the infusion site itself) is consistent with local tissue extravasation, not a systemic allergic reaction, which would present differently (hives, difficulty breathing) and require different management (epinephrine) than the local extravasation management described in this vignette.

148. C. Radiation dermatitis is a painful skin reaction, ranging from erythema to peeling and desquamation, resulting from the cumulative effect of ionizing radiation on skin within the treatment field, developing over the course of radiation therapy, matching this vignette's presentation, timeline, and attributed cause precisely. Chemotherapy-induced oral mucositis involves the oral mucosa, an entirely different tissue and anatomic location from the skin reaction within a radiation field described in this vignette. Cellulitis is an infectious skin process, which this vignette explicitly distinguishes from the described finding by attributing it directly to radiation exposure rather than infection.

149. B. Cancer can produce pain through secondary mechanical effects on adjacent structures, such as ureteral obstruction and resultant hydronephrosis from local tumor compression, illustrating that cancer pain sources extend beyond the primary tumor site itself to its downstream mechanical effects on nearby organs, matching this vignette's presentation and mechanism precisely. This vignette explicitly describes pain arising from a SECONDARY effect (ureteral obstruction) rather than directly from the primary tumor mass, directly contradicting a claim that cancer pain always arises directly from the primary tumor itself. Ureteral obstruction from a pelvic malignancy is a well-recognized cause of flank and back pain from resultant hydronephrosis and renal capsule distension, directly contradicting a claim that no such association exists.

150. B. Hepatic capsule (Glisson's capsule) distension from liver enlargement due to metastatic tumor burden is a recognized mechanism of cancer-related pain, producing a deep, aching right upper quadrant discomfort distinct from pain arising from direct tissue invasion elsewhere, matching this vignette's description and mechanism precisely. This vignette explicitly describes pain resulting from liver metastases and organ enlargement, directly contradicting a claim that liver metastases never cause pain regardless of size or growth rate. This vignette specifically describes capsule STRETCHING as the pain mechanism (not peritoneal invasion), illustrating that organ capsule distension is a genuine, distinct pain mechanism, contradicting a claim that all abdominal cancer pain arises exclusively from direct peritoneal invasion.

151. C. Childhood cancer survivors can experience persistent chronic pain, including joint and bone pain, related to lasting effects of chemotherapy and radiation received during treatment, representing an important and ongoing consideration in long-term survivorship care even decades after successful treatment, matching this vignette's description and clinical context precisely. This vignette explicitly attributes the chronic pain to lasting treatment effects WITHOUT evidence of recurrence, directly contradicting a claim that such pain always indicates disease recurrence and should never be attributed to treatment effects. This vignette explicitly describes chemotherapy and radiation as having lasting musculoskeletal effects contributing to chronic pain decades later, directly contradicting a claim that childhood cancer treatments have no recognized long-term musculoskeletal effects.

152. A. Comprehensive management of a fungating malignant wound addresses both pain control and odor management together, since both symptoms significantly affect a patient's comfort, quality of life, and dignity, and this dual-focus approach reflects good palliative wound care practice, matching this vignette's described comprehensive approach precisely. Odor management has significant, well-recognized bearing on a patient's overall quality of life and dignity (it can affect social interaction and self-image), directly contradicting a claim that it has no relationship to these outcomes. Fungating malignant wounds are frequently painful, and this vignette explicitly describes the wound as painful, directly contradicting a claim that such wounds are never painful and require attention only to odor.

153. B. Validated behavioral pain assessment tools designed for critically ill, nonverbal patients (such as those used broadly in ICU settings) can be appropriately applied to guide analgesic management in critically ill cancer patients who cannot self-report, illustrating that standard ICU pain assessment

principles extend to this population, matching this vignette's described approach precisely. This vignette explicitly describes a validated behavioral tool being successfully used to guide analgesic titration in this population, directly contradicting a claim that pain assessment is impossible and should not be attempted. This vignette explicitly describes using a standard ICU behavioral pain tool (adapted to the oncologic context, not replaced by an entirely separate methodology), directly contradicting a claim that an entirely different, non-overlapping cancer-specific methodology is required.

154. A. Not all spinal metastases produce spinal cord or nerve root compression; localized vertebral pain without neurologic compromise, confirmed by imaging and exam, allows for a less urgent, symptom-focused pain management approach, distinct from the true oncologic emergency management required when cord compression is present or strongly suspected, matching this vignette's presentation and management approach precisely. This vignette explicitly describes an absence of cord compression on exam and imaging, specifically allowing for a LESS urgent approach, directly contradicting a claim that emergent MRI and high-dose corticosteroids are always required regardless of exam findings. Spinal metastases without current cord compression CAN progress to cause compression later, which is precisely why ongoing monitoring and patient education about warning symptoms remain important, making a claim that no further monitoring is ever needed incorrect and potentially unsafe.

155. B. Chronic mesenteric ischemia, often called "intestinal angina," produces reproducible postprandial abdominal pain from inadequate mesenteric blood flow to meet the increased metabolic demand of digestion, leading to food fear and weight loss, matching this vignette's reproducible timing pattern and clinical consequences precisely. Acute mesenteric ischemia is a sudden-onset surgical emergency with severe, non-reproducible pain, a fundamentally different time course from the chronic, reliably reproducible postprandial pattern described in this vignette. Functional dyspepsia does not have an underlying vascular ischemic mechanism, and this vignette's reproducible postprandial timing and weight loss pattern is more specifically consistent with a vascular process than a functional one.

156. A. Testicular torsion presents with sudden, severe unilateral scrotal pain, nausea and vomiting, a high-riding horizontally oriented testicle, and an absent cremasteric reflex, representing a true surgical emergency requiring immediate detorsion to preserve testicular viability, matching this vignette's presentation and exam findings precisely. Epididymitis typically has a more gradual onset over hours to days, often with associated urinary symptoms, a different time course from the sudden, acute presentation described in this vignette. Chronic prostatitis/chronic pelvic pain syndrome is a chronic condition with a gradual, persistent presentation, not the sudden, acute surgical emergency described in this vignette.

157. A. Epididymitis presents with gradual-onset scrotal pain and swelling over one to two days, often with dysuria and low-grade fever from an infectious/inflammatory process, tenderness posterior to the testicle, and characteristic relief of pain with scrotal elevation (positive Prehn sign), matching this vignette's presentation, timeline, and exam finding precisely. Testicular torsion has a sudden, acute onset without the gradual gradual timeline, dysuria, or fever described in this vignette, and typically shows a NEGATIVE Prehn sign (elevation does not relieve torsion pain), making it an inconsistent diagnosis for

this vignette. Testicular cancer classically presents as a painless testicular mass, not the acute painful, febrile, infectious presentation described in this vignette.

158. C. Diverticulitis results from inflammation of a colonic diverticulum, classically presenting with left lower quadrant pain (given the sigmoid colon's common location for diverticula), along with fever and altered bowel habits, matching this vignette's presentation, location, and imaging finding precisely. Appendicitis classically presents with right lower quadrant pain, an anatomically distinct location from the left lower quadrant sigmoid pathology described in this vignette. Biliary colic presents with right upper quadrant pain, an anatomically distinct location from the left lower quadrant sigmoid colon pathology described in this vignette.

159. A. Esophageal spasm produces severe, squeezing substernal chest pain from uncoordinated, high-amplitude esophageal contractions, capable of closely mimicking cardiac chest pain, confirmed by esophageal manometry after cardiac causes have been excluded, matching this vignette's presentation, trigger, and diagnostic finding precisely. GERD typically produces a burning retrosternal sensation related to acid reflux, a different mechanism from the manometrically confirmed motor disorder (uncoordinated contractions) described in this vignette. Peptic ulcer disease produces epigastric pain related to meal timing, a different location and mechanism from the substernal chest pain and swallow-triggered esophageal motor abnormality described in this vignette.

160. C. Mittelschmerz refers to brief, recurring, mid-cycle unilateral pelvic pain associated with ovulation, from minor peritoneal irritation as the egg is released, typically lasting hours without fever or other concerning findings, matching this vignette's timing, duration, and benign nature precisely. Ovarian torsion is a surgical emergency with persistent, severe pain requiring urgent intervention, a fundamentally different severity and clinical urgency from the brief, self-limited, recurring pattern described in this vignette. Endometriosis produces a more chronic pain pattern, often related to but not strictly confined to the precise mid-cycle timing of the brief episodes described in this vignette.

161. C. Boerhaave syndrome is a full-thickness esophageal rupture, classically occurring after an episode of forceful vomiting, producing severe chest/abdominal pain, subcutaneous emphysema (crepitus) from mediastinal air leakage, and representing a true surgical emergency, matching this vignette's mechanism, presentation, and imaging finding precisely. Esophageal spasm is a motor disorder without any structural tear or perforation, an entirely different, non-emergent condition from the full-thickness rupture described in this vignette. Peptic ulcer disease involves the stomach or duodenum, an anatomically distinct location from the esophageal rupture described in this vignette.

162. A. Chronic functional constipation can itself produce chronic, crampy visceral abdominal pain through colonic distension from retained stool, improving somewhat after a bowel movement, representing a benign but clinically significant visceral pain source distinct from a structural or inflammatory process, matching this vignette's presentation and its illustrated concept precisely. This vignette explicitly describes constipation producing chronic abdominal pain through colonic distension, directly contradicting a claim that constipation has no recognized relationship to abdominal pain of any

kind. This vignette explicitly states there are no alarm features (no weight loss or blood in stool), and functional constipation-related pain without alarm features does NOT require the same urgent workup as pain with alarm features, making this option's urgency claim incorrect.

163. C. SUNCT syndrome is characterized by very brief, extremely frequent attacks of severe unilateral periorbital pain with prominent conjunctival injection and tearing, and it is specifically distinguished from other trigeminal autonomic cephalalgias by its lack of significant indomethacin responsiveness, matching this vignette's attack characteristics and diagnostic clue precisely. Paroxysmal hemicrania is, by definition, completely responsive to indomethacin, which is the opposite of the lack of response described in this vignette, making it an inconsistent diagnosis. Cluster headache attacks typically last longer (15-180 minutes) than the very brief seconds-to-minutes attacks described in this vignette, making it a less precise match for this specific presentation.

164. B. New daily persistent headache is a distinct headache syndrome characterized by an abrupt onset, often on a specific day the patient can clearly recall, that becomes continuous and unremitting from that point forward, without evolving gradually like chronic migraine, matching this vignette's description of the abrupt, clearly-dated onset and subsequent persistence precisely. Chronic migraine typically evolves gradually from episodic migraine over time, rather than beginning abruptly on a single clearly remembered day, making it an inconsistent match for this vignette's onset pattern. Medication overuse headache is specifically related to frequent use of acute headache medications, a different mechanism from the de novo abrupt-onset headache described in this vignette, which has no such medication overuse history mentioned.

165. B. Post-traumatic headache is a headache disorder specifically attributed to head trauma, developing within a recognized time window after the injury (commonly within seven days), often with mixed tension-type and migrainous features, and can persist chronically in a subset of patients, matching this vignette's timeline, feature pattern, and trauma history precisely. Idiopathic intracranial hypertension is an unrelated condition typically associated with obesity and elevated intracranial pressure, without the preceding head trauma history that is central to this vignette's presentation. Cluster headache is a primary headache disorder with a distinct attack pattern (severe, brief, autonomic-associated attacks) unrelated to trauma, not the persistent daily post-injury headache pattern described in this vignette.

166. C. Primary stabbing headache, often called "ice pick" headache, produces brief, sharp, stabbing pains lasting only a second or two, occurring irregularly and unpredictably in varying locations, without associated autonomic features, matching this vignette's description precisely. Trigeminal neuralgia produces pain confined to a specific trigeminal nerve division, typically triggered by specific stimuli, rather than the irregularly migrating location pattern described in this vignette. Cluster headache attacks last considerably longer (15-180 minutes) and are associated with prominent autonomic features (tearing, congestion), neither of which is described in this vignette's brief, autonomic-feature-free presentation.

167. C. Primary exertional headache is a headache reproducibly triggered by physical exertion, resolving within a defined period after stopping the activity, and is a diagnosis of exclusion made after a thorough workup rules out a secondary cause (such as a vascular abnormality), matching this vignette's presentation, trigger, and diagnostic approach precisely. Cervicogenic headache is related to underlying cervical spine pathology, not specifically and reproducibly triggered by exertion itself as described in this vignette. Medication overuse headache is related to frequent analgesic medication use, an entirely different trigger and mechanism from the exertion-triggered headache described in this vignette.

168. A. Glossopharyngeal neuralgia involves the glossopharyngeal nerve, producing brief, severe, electric shock-like pain in the throat, tonsillar region, and back of the tongue, often triggered by swallowing, chewing, or talking, and occasionally radiating to the ear, matching this vignette's location, trigger, and pain quality precisely. Trigeminal neuralgia involves the trigeminal nerve and produces pain in the FACE rather than the throat/tonsillar region, an anatomically distinct distribution from the presentation described in this vignette. The facial nerve is a primarily motor nerve, and its dysfunction (Bell's palsy) produces facial weakness rather than the neuralgic throat pain syndrome described in this vignette.

169. B. A traumatic or stump neuroma is a focal, palpable, tender nodule formed by disorganized regenerating nerve fibers at the site of a transected nerve, reproducing pain with direct percussion, distinct from the diffuse, non-palpable phantom sensations perceived as arising from the absent limb, matching this vignette's focal exam finding precisely. Phantom limb pain is perceived as arising from the absent distal limb itself and is not associated with a focal, palpable, percussion-tender nodule at the residual limb, making it an inconsistent match for this vignette's specific physical exam finding. CRPS produces a diffuse pattern of autonomic and sensory changes affecting the limb broadly, not a focal, palpable, percussion-tender nodule as described in this vignette.

170. B. Anterior interosseous nerve syndrome involves compression of a pure motor branch of the median nerve in the proximal forearm, producing characteristic weakness of thumb and index finger flexion (inability to form an "OK" sign) without any sensory loss, since the nerve carries no cutaneous sensory fibers, matching this vignette's motor-only deficit and mechanism precisely. Carpal tunnel syndrome involves the median nerve at the wrist and produces BOTH sensory and motor findings, unlike the pure motor deficit without any sensory loss described in this vignette. Cubital tunnel syndrome involves the ulnar nerve at the elbow, producing sensory changes in the ring and little fingers along with weakness, an entirely different nerve and symptom pattern from the pure median motor deficit described in this vignette.

171. C. Anesthesia dolorosa is a recognized complication of ablative procedures like trigeminal rhizotomy, producing constant, unpleasant, burning deafferentation pain within an area that has been rendered numb by the nerve ablation itself, matching this vignette's new pain character, timing, and location within the numb area precisely. This vignette explicitly describes a constant, burning sensation within a numb area, which is a fundamentally different pain quality from the brief, electric shock-like paroxysmal pattern of the original trigeminal neuralgia, making recurrent trigeminal neuralgia an

inconsistent description. This vignette explicitly describes the new pain arising in the same distribution treated by the ablative procedure and within the resulting numb area, making an unrelated, coincidental TMD diagnosis an inconsistent explanation for this specific temporal and anatomic relationship.

172. B. Amyloid neuropathy results from abnormal amyloid protein deposits infiltrating peripheral nerve tissue, producing painful peripheral neuropathy along with autonomic symptoms, and can be associated with an underlying plasma cell disorder (such as AL amyloidosis) or hereditary transthyretin amyloidosis, matching this vignette's presentation, biopsy finding, and associated condition precisely. Charcot-Marie-Tooth disease is a hereditary neuropathy without amyloid protein deposition or an associated plasma cell disorder, making it an inconsistent match for this vignette's biopsy finding and clinical context. Guillain-Barre syndrome is an acute autoimmune demyelinating process without amyloid protein deposition, a different mechanism and time course from the amyloid infiltration described in this vignette.

173. A. Radiation-induced peripheral neuropathy can affect an isolated peripheral nerve within a prior radiation field, producing slowly progressive numbness and mild weakness in that nerve's distribution, distinct from the more extensive, multi-root involvement and typically more prominent pain seen with radiation-induced brachial plexopathy, matching this vignette's isolated nerve distribution and milder pain profile precisely. Radiation-induced brachial plexopathy involves the entire plexus (multiple nerve roots), a more extensive distribution than the isolated single peripheral nerve described in this vignette. Guillain-Barre syndrome is an acute autoimmune process unrelated to radiation exposure, an entirely different mechanism and time course from the slowly progressive, radiation-field-localized neuropathy described in this vignette.

174. C. The sural nerve is a purely sensory nerve, formed from branches of the tibial and common peroneal nerves, supplying the lateral foot and ankle, and it is recognized as vulnerable to injury during posterolateral ankle surgical approaches, matching this vignette's distribution, nerve composition, and surgical risk precisely. The saphenous nerve supplies the medial, not lateral, aspect of the leg and foot, an anatomically distinct distribution from the lateral foot/ankle presentation described in this vignette. The deep peroneal nerve is a mixed motor-sensory nerve supplying the anterior compartment and a small dorsal foot web space, a different composition and distribution from the purely sensory sural nerve described in this vignette.

175. B. The saphenous nerve is a purely sensory terminal branch of the femoral nerve, traveling through the adductor canal to supply the medial knee and lower leg, and it is recognized as vulnerable to injury near knee arthroscopy portal sites, matching this vignette's distribution and surgical context precisely. The sural nerve supplies the lateral, not medial, aspect of the leg, an anatomically distinct distribution from the medial-sided presentation described in this vignette. The obturator nerve supplies the medial thigh and hip adductors, a more proximal distribution than the medial knee and lower leg symptoms described in this vignette.

176. A. Restless legs syndrome produces an uncomfortable, difficult-to-describe sensation in the legs with an urge to move them, characteristically worse at rest and in the evening and partially relieved by movement, without a focal structural or nerve entrapment explanation, matching this vignette's description, timing pattern, and movement relationship precisely. Tarsal tunnel syndrome is a focal nerve entrapment producing relatively fixed numbness and paresthesia in a specific nerve distribution, not the bilateral, rest-worsened, movement-relieved sensation described in this vignette. Meralgia paresthetica produces a focal sensory disturbance limited to the lateral thigh from a single entrapped nerve, an anatomically distinct and unilateral-tending pattern from the bilateral, diffuse leg sensation described in this vignette.

177. A. Post-traumatic trigeminal neuropathy results from direct nerve injury during a procedure such as dental extraction, producing persistent numbness, tingling, and burning pain in the affected nerve's distribution, mechanistically and clinically distinct from the brief, paroxysmal, triggered pain pattern of classic trigeminal neuralgia, matching this vignette's presentation and its explicit distinction precisely. Classic trigeminal neuralgia produces brief, electric shock-like TRIGGERED pain paroxysms, which is explicitly different from the persistent numbness and burning described in this vignette, making it an inconsistent diagnosis for this specific presentation. Temporomandibular disorder involves jaw joint and muscle dysfunction, an entirely different structure and mechanism from the direct nerve injury described in this vignette.

178. B. Diabetic amyotrophy, also called diabetic lumbosacral radiculoplexus neuropathy, presents with sudden, severe, asymmetric proximal thigh and hip pain followed by progressive proximal weakness and muscle wasting, a distinct clinical entity from the more common symmetric distal sensorimotor pattern of typical diabetic neuropathy, matching this vignette's presentation precisely. Typical diabetic peripheral polyneuropathy produces a symmetric, distal, sensory-predominant pattern, which is explicitly different from the asymmetric, proximal, motor-predominant presentation described in this vignette. Diabetic autonomic neuropathy affects autonomic functions like blood pressure regulation and GI motility, not the proximal motor weakness and wasting described in this vignette.

179. B. Erb's palsy results from a stretch injury to the upper brachial plexus roots (typically C5-C6) during a difficult delivery complicated by shoulder dystocia, producing the characteristic "waiter's tip" posture of shoulder internal rotation and elbow extension, matching this vignette's delivery history, mechanism, and classic posture precisely. Congenital muscular torticollis involves contracture of the sternocleidomastoid muscle producing a fixed neck tilt, an entirely different structure and presentation from the brachial plexus nerve injury and arm posture described in this vignette. This vignette explicitly describes a birth-related injury from shoulder dystocia during delivery, a fundamentally different mechanism and population from an adult traumatic brachial plexus injury from high-energy trauma.

180. C. Copper deficiency is a less commonly recognized but clinically important cause of myeloneuropathy after bariatric surgery, producing gait imbalance, numbness, and weakness that can closely resemble the presentation of vitamin B12 deficiency, and should specifically be considered and tested for in this population, matching this vignette's description and its explicit distinction from B12

deficiency precisely. This vignette explicitly states the deficiency is distinct from vitamin B12, directly ruling out B12 deficiency as the answer despite its more common association with post-bariatric neurologic complications. Iron deficiency classically causes fatigue and anemia-related symptoms, not the specific myeloneuropathy syndrome (gait imbalance, numbness, weakness) described in this vignette.

181. A. Hereditary neuropathy with liability to pressure palsies is a hereditary condition causing unusually heightened susceptibility to recurrent, transient compression neuropathies from even minor, brief nerve compression, with episodes typically resolving over days to weeks, matching this vignette's presentation, pattern, and family history precisely. Guillain-Barre syndrome is an acquired, typically monophasic autoimmune process without a hereditary pattern or the specific recurrent, minor-compression-triggered episodes described in this vignette. Chronic inflammatory demyelinating polyneuropathy produces a chronic or relapsing but generally progressive course, not the discrete, recurrent, minor-trigger-related transient episodes described in this vignette.

182. B. Arsenic toxicity causes a painful, symmetric sensorimotor polyneuropathy along with characteristic Mees' lines (transverse white lines on the fingernails) and gastrointestinal symptoms, matching this vignette's combination of neurologic and characteristic nail findings precisely. Lead toxicity classically causes a predominantly motor neuropathy (such as wrist drop), not the painful sensorimotor pattern with the specific Mees' lines nail finding described in this vignette. Mercury toxicity classically causes neuropsychiatric symptoms and tremor rather than the specific combination of painful polyneuropathy and Mees' lines described in this vignette.

183. A. Leprosy, caused by *Mycobacterium leprae*, produces patchy areas of skin numbness and characteristic palpably thickened peripheral nerves, and it remains a leading global infectious cause of peripheral neuropathy in endemic regions, matching this vignette's presentation, exam finding, and epidemiologic context precisely. Guillain-Barre syndrome is an acute, autoimmune demyelinating process, an entirely different mechanism from the chronic mycobacterial infection described in this vignette. Charcot-Marie-Tooth disease is a hereditary condition with a genetic basis, not an infectious process, making it an inconsistent match for the mycobacterial infection described in this vignette.

184. A. Isoniazid interferes with pyridoxine (vitamin B6) metabolism, and this mechanism is responsible for its well-recognized peripheral neuropathy side effect, which can be mitigated or prevented with concurrent pyridoxine supplementation during isoniazid therapy, matching this vignette's mechanism, timeline, and treatment consideration precisely. Rifampin is another antituberculosis medication but is not classically associated with pyridoxine-related peripheral neuropathy, making it an inconsistent match for the specific mechanism described in this vignette. Ethambutol is classically associated with optic neuropathy (affecting vision), not the peripheral sensory neuropathy from pyridoxine interference described in this vignette.

185. C. Pain management in correctional settings requires balancing a patient's legitimate treatment needs against institution-specific considerations including security protocols, restricted formularies, and

elevated diversion risk, reflecting a genuinely unique care environment that shapes clinical decision-making, matching this vignette's described balancing act precisely. Incarcerated patients retain a right to appropriate medical care, including treatment for documented chronic pain conditions, directly contradicting a claim that they have no right to such treatment while in custody. This vignette explicitly describes security and diversion concerns as legitimately shaping the pain management approach in this setting, directly contradicting a claim that these considerations are entirely irrelevant to clinical decision-making.

186. B. Variants beyond cytochrome P450 metabolizing enzymes, such as in the OPRM1 gene encoding the mu-opioid receptor itself, can also contribute to individual variability in opioid analgesic response by altering receptor binding, illustrating that opioid pharmacogenomics extends beyond metabolism alone, matching this vignette's described finding and its broader implication precisely. This vignette explicitly describes an OPRM1 receptor gene variant (distinct from CYP2D6) also influencing opioid response, directly contradicting a claim that CYP2D6 metabolizer status is the only pharmacogenomic factor that can ever matter. This vignette explicitly demonstrates a pharmacogenomic finding with established relevance to opioid response, directly contradicting a claim that such testing has no established relevance and should never be considered.

187. A. Prior authorization requirements can create meaningful administrative barriers and treatment delays, even for recommended non-opioid medications and interventional procedures, affecting timely access to appropriate pain care, matching this vignette's described delay and its underlying administrative cause precisely. This vignette explicitly describes a delay resulting from insurance administrative processes, directly contradicting a claim that such processes have no meaningful effect on treatment access timeliness. This vignette explicitly describes prior authorization being required for a NON-opioid medication and procedure, directly contradicting a claim that such requirements apply exclusively to opioid medications.

188. C. Navigating a workers' compensation system involves distinct administrative structures, including assigned case management, mandated independent medical evaluations, and specific treatment authorization processes, that can meaningfully influence both the pace and scope of a patient's pain treatment course, matching this vignette's described system and its clinical impact precisely. This vignette explicitly describes workers' compensation as having DISTINCT features (case manager, independent evaluations, distinct authorization process) from standard health insurance, directly contradicting a claim that no such distinct features exist. This vignette explicitly describes independent medical evaluations as influencing treatment authorization and pace of care, directly contradicting a claim that such evaluations have no bearing on these outcomes.

189. B. Assumptions based on a patient's visible disability can sometimes lead to diagnostic overshadowing, in which new or changing pain symptoms are attributed reflexively to the known disability without thorough independent evaluation, potentially delaying recognition of a separate problem, matching this vignette's described concern and its clinical significance precisely. This vignette explicitly raises concern that new or changing symptoms might be under-evaluated due to this

assumption, directly contradicting a claim that the disability always fully and completely explains all pain, making further evaluation unnecessary. This vignette explicitly describes a real, recognized bias-related effect on evaluation quality for patients with visible disabilities, directly contradicting a claim that no such effect ever occurs.

190. C. Advance care planning is a structured, proactive discussion addressing future goals of care, treatment preferences, and healthcare decision-maker designation, conducted well before a medical crisis requires those decisions to be made urgently, matching this vignette's described conversation and its proactive timing precisely. Informed consent for a single procedure addresses only that immediate, specific intervention, a narrower scope than the broader, future-oriented goals-of-care discussion described in this vignette. Surrogate decision-making is specifically invoked once a patient has already lost capacity, which is the reactive scenario that advance care planning is specifically intended to prepare for proactively, not the proactive planning process itself described in this vignette.

191. B. Informed consent for research participation includes additional specific elements beyond standard treatment consent, such as clearly explaining the investigational nature of the intervention, the trial's specific purpose, and the patient's explicit right to withdraw at any time without penalty, matching this vignette's described process and its distinct elements precisely. This vignette explicitly distinguishes research consent from consent for STANDARD treatment, directly contradicting a claim that the two are identical in every respect. This vignette describes a patient with intact decision-making capacity being asked to consent for themselves, not a surrogate consent scenario, which would only apply if the patient lacked capacity.

192. C. Navigating a veteran-specific healthcare system involves distinct structural features, including a dedicated network of facilities, specific referral processes, a separate formulary, and distinct eligibility and enrollment rules, all of which can meaningfully shape a patient's access to and course of pain care, matching this vignette's described system and its clinical relevance precisely. This vignette explicitly describes the veteran healthcare system as having a DISTINCT network, referral process, and formulary compared to civilian systems, directly contradicting a claim that no meaningfully distinct structural features exist. This vignette explicitly frames eligibility and enrollment structure as part of what shapes a patient's actual care access, directly contradicting a claim that these structures have no bearing on treatment access.

193. A. Chronic pain treatment in a patient with substance use disorder in stable remission requires individualized, careful weighing of legitimate pain treatment needs against relapse risk, favoring non-opioid approaches where reasonably effective while remaining open to carefully monitored opioid use when genuinely needed, rather than a reflexive blanket approach, matching this vignette's described balanced clinical approach precisely. This vignette explicitly describes the SUD history as a relevant factor actively shaping the treatment approach (favoring non-opioid options, careful monitoring), directly contradicting a claim that such history has no bearing whatsoever on management. This vignette explicitly describes remaining open to careful, monitored opioid use if genuinely needed, directly

contradicting a claim that opioids must be permanently and categorically denied to any patient with any SUD history regardless of remission duration.

194. B. Treating a competitive athlete's chronic pain requires specific physician awareness of anti-doping regulations, since even otherwise-routine analgesic medications may appear on a prohibited substances list and could jeopardize the athlete's competition eligibility if prescribed without this verification, matching this vignette's described consideration and its clinical importance precisely. This vignette explicitly describes anti-doping regulations as directly shaping which medications can appropriately be prescribed, directly contradicting a claim that such regulations have no bearing on analgesic prescribing decisions. This vignette specifically describes verifying whether a medication is prohibited (implying some are and some are not), directly contradicting a sweeping claim that all analgesic medications without exception are prohibited for any competitive athlete.

195. C. This protocol addresses continuity of essential medication access for chronic pain patients during a natural disaster or other significant disruption to normal pharmacy and healthcare access, a genuine and clinically important preparedness consideration for patients dependent on ongoing medication for pain management, matching this vignette's described protocol and its purpose precisely. Natural disasters and other disruptions represent a realistic, recognized threat to medication access continuity, which is precisely why this vignette's clinic developed a specific protocol to address it, directly contradicting a claim that this concern has no realistic likelihood of relevance. This vignette explicitly describes the protocol addressing "essential medications" broadly, not opioids exclusively, directly contradicting a claim that such planning applies only to opioid medications.

196. C. Limited digital literacy or lack of reliable technology access can itself function as a genuine barrier to telehealth-based care, even when telehealth is intended to improve access, requiring alternative accommodations such as phone-only visits or continued in-person care for affected patients, matching this vignette's described scenario and its practical resolution precisely. This vignette explicitly describes a patient unable to reliably access or navigate telehealth technology, directly contradicting a claim that every patient has equal, reliable ability to use video-based telehealth without any accommodation need. This vignette explicitly describes the patient's limited technology access and digital literacy as the direct cause of needing an alternative visit format, directly contradicting a claim that such limitations have no bearing on a patient's ability to benefit from telehealth.

197. A. Immigrant and refugee patients may face healthcare system navigation barriers, such as unfamiliarity with referral processes and insurance enrollment, that are distinct from and in addition to language barriers alone, requiring additional dedicated care coordination support beyond interpretation services, matching this vignette's described scenario and its stated additional need precisely. This vignette explicitly states that navigation support is needed BEYOND simply addressing the language barrier alone, directly contradicting a claim that language interpretation services alone are always fully sufficient to address every barrier this population might face. This vignette explicitly describes specific, meaningful navigation barriers faced by this population, directly contradicting a claim that no such meaningful barriers exist beyond those faced by any other patient population.

198. C. Disparities in access to interventional pain procedures can exist based on insurance type, related in part to differences in reimbursement rates and provider participation across different coverage types (such as Medicaid versus private insurance), representing a recognized, clinically significant access equity issue, matching this vignette's described observation and its underlying explanation precisely. This vignette explicitly describes a real, observed relationship between insurance type and procedural access wait times, directly contradicting a claim that insurance type has no meaningful relationship to procedural access. This vignette explicitly describes DIFFERENCES in reimbursement rates and provider participation between insurance types, directly contradicting a claim that all insurance types provide completely identical reimbursement and provider participation.

199. A. Limited transportation access can itself function as a meaningful, practical barrier to consistent chronic pain treatment engagement, independent of a patient's underlying motivation or adherence intent, and recognizing this distinction is important for appropriately addressing missed appointments, matching this vignette's described scenario and its stated distinction precisely. This vignette explicitly states the missed appointments are due to a genuine transportation barrier, NOT a lack of motivation, directly contradicting a claim that missed appointments always reflect a lack of motivation rather than a practical access barrier. This vignette explicitly describes transportation access as the direct cause of the patient's missed appointments, directly contradicting a claim that transportation access has no meaningful relationship to appointment attendance.

200. C. Job loss resulting from chronic pain can itself function as a significant psychosocial stressor, contributing to worsened pain and disability through loss of income, daily structure, and occupational identity, extending beyond purely financial impact alone, matching this vignette's described recognition and its broader psychosocial framing precisely. This vignette explicitly describes loss of structure and IDENTITY, not just income, as contributing factors, directly contradicting a claim that job loss has no meaningful psychosocial impact beyond purely financial consequences. This vignette explicitly describes employment status as bidirectionally related to the pain and disability trajectory, directly contradicting a claim that employment status has no bearing on this trajectory in either direction.