

COMPREHENSIVE MOCK EXAM 7

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 basic-science study measures conduction velocity in an unmyelinated peripheral nerve fiber with a conduction velocity under 2 m/s that mediates the dull, diffuse, poorly localized "second pain" felt seconds after a pinprick, distinct from the initial sharp sensation. Which fiber type is being described?

- A. A-beta fiber, a large myelinated afferent
- B. A-delta fiber, a thinly myelinated afferent
- C. C fiber, an unmyelinated slow-conducting afferent

2. A researcher studying spinal nociceptive processing identifies a class of dorsal horn neuron that receives convergent input from both nociceptive (A-delta/C fiber) and non-nociceptive (A-beta fiber) afferents, allowing it to encode a broad range of stimulus intensities from innocuous to noxious. What is this neuron type called?

- A. Wide dynamic range (WDR) neuron
- B. Nociceptive-specific neuron
- C. Low-threshold mechanoreceptor neuron

3. Investigators studying a chronic pain model find that repeated afferent stimulation produces a persistent, activity-dependent strengthening of synaptic connections in the spinal dorsal horn that outlasts the initial stimulus by hours to days, contributing to pain chronicity at the synaptic level. What synaptic mechanism does this describe?

- A. Axonal Wallerian degeneration of a nerve
- B. Peripheral nerve remyelination process
- C. Long-term potentiation (LTP) of dorsal horn synapses

4. A patient has chronic widespread pain with no evidence of tissue damage on exam or imaging and no identifiable nerve lesion, yet reports significant pain believed to arise from altered central nervous system pain processing itself. According to current pain taxonomy, which mechanistic category does this pain best fit?

- A. Nociplastic pain
- B. Nociceptive pain

C. Neuropathic pain

5. A research team follows a group of patients with a specific occupational exposure over several years, comparing the subsequent incidence of chronic low back pain to a similar group without that exposure, without randomly assigning the exposure itself. What type of study design is this?
- A. Randomized controlled trial**
 - B. Cohort study**
 - C. Case report**
6. A clinical trial reports that a new analgesic reduced mean pain scores by 2 points on a 10-point scale, with a 95% confidence interval of 1.5 to 2.5. How should this confidence interval be interpreted?
- A. The range within which the true population effect is likely to lie, given the observed data and the specified 95% confidence level**
 - B. The exact range of pain score reduction experienced by every individual patient in the trial**
 - C. The probability that the drug has no true effect on pain, a null-hypothesis probability statement**
7. A pain clinic implements a policy requiring that any major change in a chronic pain treatment plan be documented along with evidence that the risks, benefits, and alternatives were discussed with the patient and that the patient's preferences were incorporated into the final decision. What practice does this represent?
- A. Universal precautions screening, a standardized initial risk-stratification approach applied to all opioid starts**
 - B. Peer chart review, a distinct quality-assurance practice for documentation compliance**
 - C. Shared decision-making, with documentation of the collaborative process**
8. A physician assistant practicing in a pain clinic under physician supervision wants to independently adjust a patient's controlled substance prescription. Before doing so, the clinic must confirm what scope of independent prescribing authority is permitted under the specific requirements of the state medical board. What does this illustrate?

- A.** Federal DEA registration renewal requirements, which are identical nationwide regardless of state
- B.** State-specific scope-of-practice and supervision/delegation requirements governing advanced practice provider prescribing authority
- C.** HIPAA requirements governing release of the patient's records, an unrelated privacy regulation

9. A pain clinic's billing staff request access to a patient's full chart to process an insurance claim. The clinic's privacy policy requires that only the specific information needed for that particular billing purpose be shared, rather than the entire medical record. What principle does this policy reflect?

- A.** The HIPAA minimum necessary standard
- B.** The principle of therapeutic privilege
- C.** The doctrine of informed consent

10. A pain physician weighs whether to proceed with an interventional procedure that carries both meaningful potential benefit and meaningful potential risk of harm for a particular patient, ultimately deciding that the expected benefit does not sufficiently outweigh the risk in this case. Which pair of core ethical principles is most directly being balanced in this decision?

- A.** Autonomy and justice
- B.** Beneficence and non-maleficence
- C.** Fidelity and veracity

11. A pain physician administers a validated 9-item self-report questionnaire that asks a patient to rate their worst, least, average, and current pain intensity, and separately rate how much pain interferes with general activity, mood, walking, work, relationships, sleep, and enjoyment of life. Which instrument is being used?

- A.** The Oswestry Disability Index
- B.** The Brief Pain Inventory (BPI)
- C.** The Pain Catastrophizing Scale

12. A cognitively intact adult patient is asked to rate their pain intensity by choosing a whole number between 0 and 10, where 0 represents no pain and 10 represents the worst pain imaginable. What type of pain assessment tool is being used?

- A.** Numeric Rating Scale (NRS)
- B.** FLACC behavioral observation scale
- C.** PAINAD observational scale

13. A researcher applies a calibrated handheld device to a patient's skin, gradually increasing pressure until the patient reports the sensation first becomes painful, recording the exact force required in kilopascals. What type of quantitative pain assessment does this represent?

- A.** Electromyography, a muscle electrical study
- B.** Two-point discrimination testing
- C.** Pressure algometry, measuring the pressure pain threshold

14. A clinician evaluating a patient with suspected neuropathic pain administers a brief screening questionnaire asking about burning, painful cold, electric shocks, tingling, pins and needles, numbness, and itching, along with a brief bedside sensory exam, to help distinguish neuropathic from nociceptive pain. Which tool is this?

- A.** The Oswestry Disability Index, a back-specific tool
- B.** The Pain Catastrophizing Scale, a cognitive-affective tool
- C.** The DN4 questionnaire, a validated neuropathic pain screening tool

15. A primary care physician evaluating a new patient with acute low back pain uses a brief 9-item screening tool that stratifies the patient into low, medium, or high risk of developing chronic disabling back pain, in order to guide the intensity of the initial treatment approach. Which tool is being used?

- A.** The Functional Capacity Evaluation
- B.** The STarT Back screening tool
- C.** The McGill Pain Questionnaire

16. A pain physician performing diagnostic facet joint medial branch blocks recognizes that a single block carries a meaningful false-positive rate due to placebo response and other nonspecific factors, and therefore requires a second, confirmatory block with concordant relief before proceeding to radiofrequency ablation. What does this practice address?

- A.** The known false-positive rate of a single diagnostic block, improved by requiring a second confirmatory block with concordant response
- B.** The risk of epidural hematoma from the injection needle itself, a distinct anticoagulation-related concern
- C.** The requirement for antibiotic prophylaxis before diagnostic injections, an infection-prevention concern

17. A patient undergoing an independent medical evaluation for a disability claim demonstrates inconsistent effort and physical findings that are inconsistent with the reported pain severity, prompting the examiner to administer standardized tests designed to detect submaximal effort or exaggerated symptom reporting. What is this type of assessment called?

- A.** The Functional Capacity Evaluation, a physical tool
- B.** Symptom validity (effort/malingering) testing
- C.** Electrodiagnostic testing

18. A researcher uses a standardized, computer-adaptive item bank to measure the degree to which a patient's pain interferes with cognitive, emotional, physical, and social functioning, allowing comparison of scores across different pain conditions and patient populations. Which measurement system is being used?

- A.** The Wong-Baker FACES scale
- B.** PROMIS Pain Interference measure
- C.** The Glasgow Coma Scale

19. A researcher asks a patient to record their pain intensity and activity level several times per day over two weeks using a smartphone app, capturing real-time fluctuations rather than relying on the patient's recall at a single clinic visit. What methodology does this represent?

- A.** Retrospective chart review of existing records

B. Cross-sectional survey administered once

C. Ecological momentary assessment (real-time pain diary methodology)

20. A researcher administers a 25-item self-report questionnaire assessing symptoms thought to reflect heightened central nervous system sensitivity, such as fatigue, sensitivity to light and noise, and pain in multiple body regions, to help identify patients whose presentation may be driven by central sensitization. Which instrument is this?

A. The Central Sensitization Inventory

B. The Beck Depression Inventory

C. The Timed Up and Go test

21. A patient with moderate-to-severe acute pain is started on tapentadol. The prescriber explains that, unlike a pure mu-opioid agonist, this drug provides analgesia through two distinct mechanisms acting together. What are tapentadol's two mechanisms of action?

A. Pure mu-opioid receptor agonism combined with peripheral COX-2 inhibition

B. Mu-opioid receptor agonism combined with norepinephrine reuptake inhibition

C. Kappa-opioid receptor agonism combined with serotonin reuptake inhibition

22. A breastfeeding mother is prescribed codeine for postpartum pain and is later found to be a CYP2D6 ultra-rapid metabolizer. Her infant subsequently develops signs of opioid toxicity. What pharmacogenomic mechanism explains this outcome?

A. Ultra-rapid CYP2D6 metabolism converts codeine to morphine faster and in greater quantity, causing high exposure

B. CYP2D6 ultra-rapid metabolizer status prevents codeine from being converted to any active metabolite at all, ever

C. CYP2D6 status has no bearing on codeine metabolism, since codeine is entirely renally eliminated unchanged

23. A patient receiving repeated doses of meperidine for pain develops tremors, myoclonus, and a seizure. Which mechanism is responsible for this neurotoxic complication, and why does it occur with meperidine but not typically with most other opioids?

- A.** Meperidine directly blocks GABA-A receptors, lowering seizure threshold at any single dose
- B.** Meperidine causes profound hypoglycemia, which independently triggers seizure activity
- C.** Accumulation of the renally cleared, proconvulsant active metabolite normeperidine with repeated dosing

24. A patient on chronic opioid therapy develops persistent constipation that has not responded adequately to standard laxatives. The physician starts methylnaltrexone, which relieves the constipation without reversing the patient's systemic analgesia. What is the mechanism that allows this selective effect?

- A.** Methylnaltrexone is a full central mu-opioid antagonist that crosses the blood-brain barrier freely, reversing pain relief along with constipation
- B.** Methylnaltrexone is a peripherally acting mu-opioid receptor antagonist (PAMORA) that does not readily cross the blood-brain barrier, blocking gut mu receptors while sparing central analgesia
- C.** Methylnaltrexone works by directly stimulating colonic smooth muscle contraction, unrelated to opioid receptors

25. A male patient on long-term high-dose opioid therapy for chronic pain reports new fatigue, decreased libido, and is found to have a low serum testosterone level. What opioid-related endocrine complication does this represent?

- A.** Opioid-induced hyperthyroidism, an unrelated endocrine effect
- B.** Opioid-induced adrenal crisis from primary adrenal gland destruction
- C.** Opioid-induced androgen deficiency, from suppression of hypothalamic-pituitary-gonadal axis signaling

26. A patient who has completed opioid detoxification is started on oral naltrexone to help prevent relapse to opioid use. Unlike naloxone, which is used for acute overdose reversal, naltrexone is dosed for sustained, longer-term use. What is naltrexone's role in this context?

- A.** A short-acting partial agonist used only for acute intoxication reversal in the emergency department setting
- B.** A long-acting oral or injectable mu-opioid antagonist blocking euphoric effects of subsequent opioid use, for relapse prevention
- C.** A full mu-opioid agonist used to prevent withdrawal symptoms through sustained receptor activation continuously

27. A pharmaceutical manufacturer designs an extended-release oxycodone tablet that becomes a hard, difficult-to-crush gel when tampered with, making it resistant to manipulation for rapid release and non-oral routes of misuse. What is this pharmaceutical strategy called?

- A.** Standard immediate-release formulation without any tamper resistance features
- B.** Compounded liquid formulation intended solely for pediatric dosing accuracy
- C.** Abuse-deterrent formulation (ADF) technology, designed to resist physical or chemical manipulation for misuse

28. A patient started on intravenous morphine for postoperative pain develops diffuse itching without a rash, hives, or any other sign of a true allergic reaction. What is the most likely mechanism for this common opioid-related symptom?

- A.** A true IgE-mediated allergic reaction requiring immediate discontinuation and epinephrine
- B.** Opioid-induced hepatotoxicity causing cholestatic pruritus
- C.** Direct, non-immune-mediated histamine release from mast cells triggered by morphine, independent of true allergy

29. A patient stable on lithium for bipolar disorder is started on ibuprofen for musculoskeletal pain and subsequently develops signs of lithium toxicity, including tremor and confusion, without any change in lithium dose. What mechanism explains this interaction?

- A.** NSAIDs reduce renal prostaglandin-mediated clearance of lithium, increasing serum lithium concentrations
- B.** NSAIDs increase hepatic metabolism of lithium, producing a toxic metabolite
- C.** Ibuprofen has no known interaction with lithium, and the toxicity must be coincidental

30. A patient taking warfarin for atrial fibrillation is started on ibuprofen for acute pain and develops gastrointestinal bleeding. Beyond warfarin's own anticoagulant effect, what additional mechanism from the NSAID increases bleeding risk in this combination?

- A.** NSAIDs impair platelet aggregation and can independently injure the gastric mucosa, compounding bleeding risk on top of warfarin's anticoagulant effect
- B.** NSAIDs directly inhibit hepatic synthesis of vitamin K-dependent clotting factors, mimicking warfarin's own mechanism
- C.** NSAIDs have no additive bleeding risk when combined with warfarin, since they act through entirely unrelated pathways

31. A physician selecting an NSAID for a patient with osteoarthritis notes that meloxicam, at typical clinical doses, demonstrates relatively greater COX-2 selectivity compared to older nonselective NSAIDs like ibuprofen, though it is less COX-2-selective than celecoxib. What does this relative selectivity gradient influence?

- A.** Meloxicam's onset of action, which is dramatically faster than ibuprofen's regardless of COX selectivity
- B.** Meloxicam's requirement for parenteral administration only, unlike oral nonselective NSAIDs
- C.** The relative balance between GI-sparing benefit and residual COX-1-related GI/platelet risk along the COX-2 selectivity spectrum

32. A patient using over-the-counter acetaminophen regularly for chronic headaches is counseled on the maximum recommended total daily dose to avoid hepatotoxicity risk, including counting acetaminophen present in combination cold/flu and prescription combination analgesic products. What is the key safety principle being emphasized?

- A.** Total cumulative daily acetaminophen dose across all sources must be tracked to avoid unintentional overdose risk
- B.** Acetaminophen has no defined maximum daily dose since it is available without a prescription anywhere
- C.** Only prescription-strength acetaminophen products count toward the daily total; OTC products are fully exempt

33. A cardiologist selecting an NSAID for a patient with known coronary artery disease who requires occasional analgesia notes that naproxen is generally considered to carry a relatively lower cardiovascular risk profile among commonly used NSAIDs, compared to more COX-2-selective agents. What is the proposed explanation for this relative difference?

- A.** Naproxen retains more substantial, longer-lasting COX-1-mediated antiplatelet activity, partially offsetting the prothrombotic cardiovascular risk associated with COX-2 inhibition
- B.** Naproxen has no COX-1 activity whatsoever and works exclusively through a completely separate, non-prostaglandin mechanism
- C.** Naproxen's cardiovascular safety advantage comes from its ability to lower blood pressure more than any other NSAID

34. An elderly patient taking both an ACE inhibitor for hypertension and a diuretic for heart failure is started on an NSAID for osteoarthritis pain and subsequently develops acute kidney injury. What is the name given to this specific three-drug combination and its associated renal risk?

- A.** Serotonin syndrome triad, an entirely unrelated toxidrome from excess serotonergic drug activity
- B.** Milk-alkali syndrome, a distinct condition from excessive calcium and absorbable alkali intake
- C.** The "triple whammy": concurrent ACE inhibitor, diuretic, and NSAID use, synergistically reducing renal perfusion

35. A patient taking high-dose aspirin therapy for a rheumatologic condition develops tinnitus, hearing changes, and hyperventilation. What does this presentation suggest?

- A.** A typical, expected finding at any therapeutic aspirin dose, requiring no further evaluation
- B.** Early salicylate toxicity, with tinnitus classically an early warning sign preceding more severe toxicity
- C.** An unrelated primary inner ear infection with no connection to the aspirin dose

36. A patient with chronic pain and comorbid depression is started on venlafaxine at a low dose, with the prescriber explaining that at this dose the drug acts predominantly through one neurotransmitter system, but that meaningful additional activity on a second system typically requires titrating to a higher dose. What describes this dose-dependent mechanism?

- A.** Venlafaxine is purely noradrenergic at all doses, with no serotonergic activity at any dose level whatsoever
- B.** Venlafaxine's mechanism is entirely dose-independent, acting identically on all monoamine systems regardless of dose given
- C.** At lower doses venlafaxine acts predominantly as a serotonin reuptake inhibitor, while clinically meaningful norepinephrine reuptake inhibition generally requires higher doses

37. A patient with trigeminal neuralgia who cannot tolerate carbamazepine due to hyponatremia is switched to oxcarbazepine, a structurally related anticonvulsant. What is an important consideration when making this switch?

- A.** Oxcarbazepine has an identical, unimproved hyponatremia risk compared to carbamazepine, offering no advantage in this specific scenario
- B.** Oxcarbazepine generally has fewer drug interactions than carbamazepine (less potent CYP enzyme induction) but still carries a meaningful risk of hyponatremia that requires ongoing monitoring
- C.** Oxcarbazepine requires HLA-B*1502 screening in all patients regardless of ancestry, unlike carbamazepine

38. A patient with chronic migraine (fewer headache days than required for onabotulinumtoxinA candidacy) is started on topiramate for migraine prevention. Through which of the following proposed mechanisms does topiramate provide migraine prophylaxis?

- A.** Selective peripheral TRPV1 receptor antagonism, an unrelated capsaicin-type mechanism
- B.** Multiple mechanisms including GABA enhancement, sodium channel blockade, and glutamate modulation, reducing excitability
- C.** Direct mu-opioid receptor agonism providing migraine-specific analgesia through opioid pathways

39. A patient with frequent migraines and a history of epilepsy is started on divalproex sodium (valproate) for migraine prevention, since it can address both conditions with a single medication. What is an important safety consideration specific to valproate use in a woman of reproductive age?

- A.** Valproate carries significant teratogenic risk, including neural tube defects, and requires careful reproductive counseling and contraception discussion in women of childbearing potential

B. Valproate has no known reproductive or fetal safety concerns and can be used without any additional counseling in this population

C. Valproate is specifically contraindicated only in postmenopausal women, with no relevant safety concern in women of reproductive age

40. A patient with fibromyalgia and significant fatigue is started on milnacipran, a medication specifically FDA-approved for fibromyalgia rather than for depression. What class of medication is milnacipran, and what is notable about its FDA-approved indication?

A. A serotonin-norepinephrine reuptake inhibitor (SNRI) that is FDA-approved specifically for fibromyalgia, notably without an FDA-approved depression indication in the United States

B. A tricyclic antidepressant approved only for major depressive disorder, with fibromyalgia use considered strictly off-label

C. A gabapentinoid structurally unrelated to any antidepressant class, approved for fibromyalgia through the same pathway as pregabalin

41. An elderly patient with neuropathic pain is switched from amitriptyline to nortriptyline due to bothersome anticholinergic side effects (dry mouth, constipation, urinary retention) and sedation. What is the pharmacologic rationale for this switch within the same tricyclic antidepressant class?

A. Nortriptyline has no analgesic activity for neuropathic pain, making the switch purely for side-effect reasons unrelated to efficacy expectations

B. Nortriptyline and amitriptyline have identical anticholinergic and sedative side-effect profiles, so no meaningful benefit would be expected from this switch

C. Nortriptyline, the active metabolite of amitriptyline, is generally better tolerated with relatively less pronounced anticholinergic and sedative effects while retaining meaningful analgesic activity

42. A patient with chronic pain and a history of significant liver disease is being considered for duloxetine therapy for comorbid neuropathic pain and depression. What is an important prescribing consideration specific to duloxetine in this patient?

A. Duloxetine has no hepatic metabolism and can be used without any special consideration in liver disease

B. Duloxetine is specifically recommended as first-line therapy in severe hepatic impairment due to a unique renal-only elimination pathway

C. Duloxetine carries a labeled warning against use in patients with hepatic insufficiency or substantial alcohol use, given case reports of hepatotoxicity

43. A patient with postherpetic neuralgia and a history of difficulty adhering to a three-times-daily gabapentin regimen is switched to gabapentin enacarbil, an extended-release prodrug formulation. What pharmacokinetic advantage does this formulation offer?

- A. Sustained absorption via active transport, allowing once- or twice-daily dosing versus multiple daily doses
- B. Gabapentin enacarbil has a completely different mechanism of action from gabapentin, acting at NMDA receptors instead
- C. Gabapentin enacarbil requires no absorption at all, being administered exclusively via intravenous injection

44. A patient with painful muscle spasticity from a spinal cord injury is started on oral tizanidine. Through which receptor mechanism does this centrally acting muscle relaxant work?

- A. Direct agonism at peripheral nicotinic acetylcholine receptors at the neuromuscular junction
- B. Central alpha-2 adrenergic receptor agonism, reducing excitatory neurotransmitter release from spinal interneurons
- C. Selective peripheral blockade of ryanodine receptors in skeletal muscle sarcoplasmic reticulum

45. A patient with spasticity from multiple sclerosis is started on oral baclofen. Through which receptor mechanism does baclofen reduce spasticity?

- A. Direct blockade of voltage-gated sodium channels in peripheral motor nerves, unrelated to central GABA-B
- B. Agonism at GABA-B receptors in the spinal cord, inhibiting excitatory neurotransmitter release and reducing reflex muscle activity
- C. Selective inhibition of acetylcholinesterase at the neuromuscular junction

46. A patient with refractory central neuropathic pain from a spinal cord injury undergoes a trial of intravenous lidocaine infusion in a monitored setting, with meaningful pain reduction observed during

the infusion. What is the proposed mechanism behind systemic IV lidocaine's analgesic effect in this setting?

- A.** Lidocaine acts as a selective peripheral TRPV1 receptor agonist when given intravenously
- B.** Lidocaine works exclusively by inducing general anesthesia-level sedation, with pain relief being purely incidental to unconsciousness
- C.** Systemic sodium channel blockade reduces ectopic neuronal firing and central hyperexcitability contributing to central neuropathic pain, at subanesthetic plasma concentrations

47. A patient with refractory chronic pain undergoes a trial of intravenous magnesium infusion as an adjuvant analgesic. Through which receptor mechanism is magnesium proposed to contribute to analgesia?

- A.** Direct agonism at peripheral mu-opioid receptors, similar to a weak opioid agent
- B.** Selective inhibition of cyclooxygenase enzymes, similar in action to an NSAID
- C.** Physiological antagonism/blockade of the NMDA receptor calcium channel, reducing central sensitization and wind-up

48. A combination cough/cold product contains dextromethorphan, and a pain researcher notes that at higher doses this common over-the-counter ingredient also has NMDA receptor antagonist activity that has generated interest as a component in some combination analgesic approaches. What receptor mechanism is being described?

- A.** NMDA glutamate receptor antagonism, similar in mechanism (though a different specific agent) to ketamine's NMDA-blocking action
- B.** Selective serotonin 5-HT₃ receptor antagonism, similar in mechanism to an antiemetic drug
- C.** Direct agonism at peripheral cannabinoid CB₁ receptors, an unrelated receptor system entirely

49. A patient with acute low back pain and muscle spasm is prescribed methocarbamol as a short-term adjunct to other analgesics. How is methocarbamol's precise mechanism of action best characterized?

- A.** A precisely defined, direct GABA-B receptor agonist mechanism identical in every respect to baclofen
- B.** A centrally acting muscle relaxant whose mechanism is not fully established, likely general CNS depression

C. A peripheral neuromuscular blocking agent acting directly at the skeletal muscle motor endplate itself

50. A patient undergoing chemotherapy with significant chemotherapy-induced nausea that has not responded adequately to standard antiemetics is started on nabilone, a synthetic cannabinoid, which also provides some adjunctive analgesic benefit. What is nabilone's pharmacologic classification and primary receptor mechanism?

A. A plant-derived, unmodified cannabis extract acting exclusively on peripheral CB2 receptors alone

B. A benzodiazepine with incidental antiemetic properties, entirely unrelated to any cannabinoid receptor

C. A synthetic cannabinoid agonist at CB1 and CB2 receptors, similar in target to naturally occurring cannabinoids

51. A patient undergoing shoulder arthroscopy receives a preoperative ultrasound-guided regional block targeting the brachial plexus at the level of the interscalene groove, between the anterior and middle scalene muscles, to provide surgical anesthesia and postoperative analgesia to the shoulder and upper arm. Which block is this?

A. Interscalene brachial plexus block

B. Adductor canal block

C. Ilioinguinal nerve block

52. A patient undergoing total knee arthroplasty receives an ultrasound-guided regional block targeting the saphenous nerve and other sensory branches within the adductor canal of the thigh, chosen specifically because it provides analgesia while largely preserving quadriceps motor strength, unlike a femoral nerve block. Which block is this?

A. Adductor canal block

B. Interscalene brachial plexus block

C. Stellate ganglion block

53. A patient with multiple rib fractures receives an ultrasound-guided injection of local anesthetic in the fascial plane superficial to the serratus anterior muscle, along the mid-axillary line, providing analgesia to the anterolateral chest wall as an alternative to a paravertebral or epidural technique. Which block is this?

- A.** Quadratus lumborum block
- B.** Serratus anterior plane block
- C.** Adductor canal block

54. A patient undergoing abdominal surgery receives an ultrasound-guided injection of local anesthetic into the fascial plane posterior to the quadratus lumborum muscle, providing analgesia to the anterior and lateral abdominal wall with a longer duration of action than a more superficial abdominal wall block. Which block is this?

- A.** Serratus anterior plane block
- B.** Quadratus lumborum block
- C.** Interscalene brachial plexus block

55. A patient undergoing thoracic surgery receives an ultrasound-guided injection of local anesthetic adjacent to the vertebral body, just lateral to where the spinal nerve exits the intervertebral foramen, producing unilateral segmental somatic and sympathetic block similar in coverage to a thoracic epidural but confined to one side. Which block is this?

- A.** Stellate ganglion block
- B.** Celiac plexus block
- C.** Thoracic paravertebral block

56. A patient with chronic shoulder pain from adhesive capsulitis who is not a candidate for oral analgesics receives a diagnostic and therapeutic injection targeting a nerve arising from the brachial plexus that provides sensory innervation to a large portion of the shoulder joint, performed at the suprascapular notch. Which nerve block is this?

- A.** Axillary nerve block at the quadrangular space
- B.** Interscalene brachial plexus block

C. Suprascapular nerve block

57. A patient with chronic groin pain following open inguinal hernia repair, in the distribution of two specific sensory nerves that can become entrapped in surgical scar tissue, undergoes a diagnostic and therapeutic nerve block targeting these nerves near the anterior superior iliac spine. Which nerves are targeted?

- A.** The ilioinguinal and iliohypogastric nerves
- B.** The obturator and femoral nerves
- C.** The pudendal and posterior femoral cutaneous nerves

58. A patient with an acute migraine attack in the emergency department is treated with intranasal local anesthetic applied to the posterior nasal cavity, targeting an autonomic ganglion embedded in fatty tissue behind the middle turbinate, providing rapid headache relief without systemic opioid exposure. Which structure is targeted by this technique?

- A.** The stellate ganglion
- B.** The sphenopalatine ganglion
- C.** The Gasserian (trigeminal) ganglion

59. A patient with medically refractory trigeminal neuralgia undergoes a percutaneous procedure in which a needle is advanced through the cheek and foramen ovale to reach an intracranial structure at the skull base, where controlled thermal or mechanical injury is applied to relieve facial pain. Which structure is targeted?

- A.** The Gasserian (trigeminal) ganglion
- B.** The sphenopalatine ganglion
- C.** The stellate ganglion

60. A patient with a contained lumbar disc herniation and persistent radicular pain despite conservative therapy undergoes a minimally invasive procedure in which a portion of nucleus pulposus material is removed through a small percutaneous cannula, with the goal of decompressing the disc and reducing nerve root irritation, without open surgical exposure. What is this procedure called?

- A. Percutaneous discectomy**
- B. Kyphoplasty**
- C. Facet joint radiofrequency ablation**

61. During a vertebral augmentation procedure for an osteoporotic compression fracture, injected bone cement extravasates outside the vertebral body into the adjacent epidural space, a recognized complication of the procedure. What is this complication called, and what is its clinical significance?

- A. Epidural abscess, an infectious complication requiring emergent surgical decompression in every single case**
- B. Cement leakage/extravasation, which can range from asymptomatic to causing neural compression requiring further intervention depending on location and volume**
- C. Dural puncture headache, an entirely unrelated complication tied to the needle puncture itself**

62. A patient with chronic lumbar radicular pain attributed to epidural scarring after prior spine surgery undergoes a procedure in which a catheter is advanced into the epidural space under fluoroscopic guidance to mechanically and pharmacologically lyse adhesions restricting nerve root mobility. What is this procedure called?

- A. Epiduroscopy/percutaneous epidural lysis of adhesions (Racz procedure)**
- B. Sacral neuromodulation, an unrelated bladder therapy**
- C. Vertebral augmentation, an unrelated cement therapy**

63. A patient with refractory interstitial cystitis/bladder pain syndrome and associated pelvic pain is referred for an implanted neuromodulation device that stimulates the sacral nerve roots controlling bladder and pelvic floor function, distinct from a spinal cord stimulator targeting the dorsal columns. What is this therapy called?

- A. Dorsal root ganglion stimulation of the lumbar spine, targeting a different level and structure for focal limb pain**
- B. Sacral neuromodulation, targeting the S3 sacral nerve root controlling bladder and pelvic floor function**
- C. Peripheral nerve stimulation of the occipital nerve, targeting an entirely different anatomic head/scalp region**

64. A patient considering spinal cord stimulation for chronic pain is counseled that newer stimulation waveforms, such as high-frequency (10 kHz) and burst stimulation, may provide pain relief without producing the paresthesia sensation characteristic of conventional tonic stimulation. What distinguishes these newer waveforms from conventional tonic SCS?

- A.** They require a completely different, non-electrical mechanism involving direct drug delivery to the spinal cord itself
- B.** They can only be used in patients who have already failed a conventional tonic SCS trial, per strict FDA labeling rules
- C.** They deliver stimulation parameters achieving analgesia without the paresthesia felt with conventional tonic stimulation

65. A newer generation spinal cord stimulator system incorporates sensors that measure the evoked compound action potential generated in the spinal cord by each stimulation pulse, automatically adjusting stimulation amplitude in real time to maintain consistent neural activation as the patient changes position. What is this technology called?

- A.** Closed-loop (ECAP-sensing) spinal cord stimulation
- B.** Standard open-loop tonic stimulation with fixed, unchanging amplitude
- C.** Intrathecal drug delivery with a programmable flow-rate pump

66. A patient with chronic migraine refractory to standard preventive therapy and onabotulinumtoxinA undergoes implantation of a small stimulating lead placed subcutaneously over the occipital region, targeting the greater and lesser occipital nerves rather than the spinal cord. What is this therapy called?

- A.** Dorsal root ganglion stimulation, targeting a spinal structure typically used for focal limb neuropathic pain
- B.** Sacral neuromodulation, targeting sacral nerve roots for bladder and pelvic floor dysfunction
- C.** Occipital nerve stimulation, a form of peripheral nerve stimulation targeting the occipital nerves for refractory headache

67. A patient with severe spasticity from cerebral palsy, causing significant pain and functional impairment, undergoes implantation of a programmable pump delivering continuous medication directly into the intrathecal space at doses far lower than oral dosing would require, specifically to reduce spasticity and associated pain. Which medication is this pump most likely delivering?

- A.** Intrathecal morphine, for direct analgesic effect on spinal opioid receptors
- B.** Intrathecal ziconotide, for direct N-type calcium channel blockade
- C.** Intrathecal baclofen, acting on spinal GABA-B receptors to reduce spasticity

68. A patient with piriformis syndrome and associated muscle spasm causing sciatic nerve irritation, refractory to physical therapy and oral medications, undergoes an ultrasound-guided injection of botulinum toxin directly into the piriformis muscle. What is the therapeutic goal of this injection?

- A.** Permanent neurolytic destruction of the sciatic nerve itself, directly and irreversibly
- B.** Chemodenervation-induced relaxation of the piriformis muscle, reducing compressive irritation of the adjacent sciatic nerve
- C.** Systemic antispasmodic effect throughout the body via bloodstream absorption of the toxin

69. A patient with chronic sacroiliac joint pain and underlying ligamentous laxity undergoes a series of injections of a hypertonic dextrose solution into the affected ligamentous and periarticular tissue, with the stated goal of stimulating a local healing/proliferative response rather than providing an immediate anesthetic or anti-inflammatory effect. What is this treatment called?

- A.** Corticosteroid injection, providing rapid anti-inflammatory relief through a distinct mechanism entirely
- B.** Radiofrequency ablation, providing thermal nerve lesioning through an entirely different mechanism
- C.** Prolotherapy, using an irritant solution to stimulate a local proliferative healing response in lax or injured connective tissue

70. A patient with mild-to-moderate knee osteoarthritis who wants to delay joint replacement undergoes a series of intra-articular knee injections of hyaluronic acid, intended to supplement the joint's natural lubricating fluid rather than provide an anti-inflammatory steroid effect. What is this treatment called?

- A.** Intra-articular corticosteroid injection
- B.** Viscosupplementation with hyaluronic acid
- C.** Platelet-rich plasma injection

71. A patient with chronic lateral epicondylitis refractory to conservative therapy and corticosteroid injection undergoes an ultrasound-guided minimally invasive procedure in which a small needle is used to mechanically disrupt and debride degenerated tendon tissue without open surgical incision. What is this procedure called?

- A.** Percutaneous tenotomy (needle fasciotomy/tenotomy)
- B.** Radiofrequency ablation of the medial branch nerve
- C.** Vertebral augmentation

72. A patient undergoing radiofrequency ablation of the medial branch nerves for facet-mediated pain receives a newer technology that circulates cooled water through the electrode during the procedure, allowing a larger, more spherical thermal lesion to be created at lower peak tissue temperatures compared to standard RFA. What is this technology called?

- A.** Cooled (water-cooled) radiofrequency ablation
- B.** Cryoablation using a compressed-gas probe
- C.** Pulsed radiofrequency, a non-thermal technique

73. A pain physician performs a radiofrequency procedure on a dorsal root ganglion using short bursts of high-voltage current with pauses between bursts to allow heat dissipation, specifically avoiding the sustained tissue temperature elevation that would cause thermal destruction, as an alternative to conventional continuous thermal RFA. What is this technique called?

- A.** Continuous thermal radiofrequency ablation, the standard destructive technique this method specifically avoids
- B.** Chemical neurolysis with phenol, working through direct chemical protein denaturation instead
- C.** Pulsed radiofrequency, a non-ablative technique using intermittent current bursts to modulate nerve function without destructive heat lesioning

74. A patient with a focal area of chronic postsurgical scar pain undergoes implantation of a small stimulating electrode array placed subcutaneously directly beneath the painful skin region itself, rather than targeting a specific named peripheral nerve or the spinal cord. What is this technique called?

- A.** Dorsal root ganglion stimulation
- B.** Peripheral (subcutaneous) field stimulation

C. Spinal cord stimulation targeting the dorsal columns

75. A patient who develops a positional headache after an epidural steroid injection, worse when upright and improved when lying flat, consistent with a post-dural puncture headache, fails conservative management with hydration and caffeine. What is the definitive procedural treatment for this complication?

- A.** Repeat epidural steroid injection performed again at the exact same previously treated spinal level
- B.** Intrathecal opioid pump trial, an entirely unrelated therapy for chronic pain
- C.** Epidural blood patch, injecting the patient's own blood into the epidural space to seal the dural leak

76. Before beginning an interventional spine procedure, the entire care team pauses to verbally confirm the correct patient identity, correct procedure, correct site and side, and relevant allergies, with each team member actively participating in the verification. What patient-safety practice does this represent?

- A.** A procedural time-out (surgical safety checklist verification)
- B.** Root cause analysis performed after an adverse event
- C.** A formal informed consent discussion, replacing the need for any other safety verification

77. A patient with confirmed sacroiliac joint-mediated pain after two concordant diagnostic intra-articular blocks is referred for a radiofrequency procedure targeting the small sensory nerve branches (lateral branches of the sacral dorsal rami) that innervate the posterior sacroiliac joint, analogous to medial branch RFA for the lumbar facet joints. What procedure is this?

- A.** Lumbar facet medial branch radiofrequency ablation
- B.** Sacroiliac joint lateral branch radiofrequency ablation
- C.** Celiac plexus neurolysis

78. A patient undergoing a lengthy, moderately uncomfortable interventional spine procedure receives intravenous sedative medication titrated to keep them comfortable and cooperative while maintaining spontaneous respiration and the ability to respond to verbal cues, administered and monitored by a dedicated anesthesia provider throughout the case. What is this level of sedation called?

- A. General anesthesia with a secured airway
- B. No sedation, using local anesthetic alone for the entire procedure
- C. Monitored anesthesia care (MAC) with moderate procedural sedation

79. A patient with chronic vertebrogenic low back pain attributed to degenerative changes at the vertebral endplate, confirmed by characteristic Modic changes on MRI, undergoes a minimally invasive procedure that ablates a specific nerve within the vertebral body thought to transmit pain signals from the damaged endplate. Which nerve is targeted by this newer procedure?

- A. The basivertebral nerve, within the vertebral body itself
- B. The greater occipital nerve, an unrelated posterior scalp structure
- C. The pudendal nerve, an unrelated perineal structure

80. A patient with unilateral lumbar radicular pain and imaging showing a synovial cyst arising from a hypertrophic facet joint compressing the adjacent nerve root undergoes an image-guided percutaneous procedure in which the cyst is punctured and its fluid contents aspirated, sometimes followed by intentional rupture, in an attempt to avoid open surgical excision. What is this procedure called?

- A. Vertebral augmentation with cement injection
- B. Percutaneous facet synovial cyst aspiration/rupture
- C. Celiac plexus neurolysis

81. A patient with chronic low back pain avoids bending and lifting out of fear of reinjury, despite being cleared for normal activity. A physical therapist develops a structured program in which the patient gradually and repeatedly performs the specific feared movements in a graded, hierarchical fashion until fear and avoidance diminish. What treatment approach is this?

- A. Passive modality therapy using heat alone, without active movement
- B. Graded exposure therapy targeting kinesiophobia (fear of movement/reinjury)
- C. Trigger point injection therapy

82. A patient with chronic pain and significant emotional dysregulation is taught specific skills to tolerate intense distress without resorting to harmful coping behaviors, as part of a structured therapy

originally developed for borderline personality disorder but now adapted for chronic pain management. What is this therapeutic approach called?

- A. Standard progressive muscle relaxation training alone
- B. Operant conditioning-based pain behavior modification
- C. Dialectical behavior therapy (DBT) distress tolerance skills training

83. A pain physician uses a patient-centered communication style, exploring and resolving a patient's ambivalence about reducing opioid use by asking open-ended questions, reflecting the patient's own stated reasons for change, and avoiding direct confrontation or argument. What communication technique is this?

- A. Cognitive restructuring targeting catastrophic thoughts
- B. Motivational interviewing
- C. Systematic desensitization

84. A patient with chronic pain and significant difficulty falling and staying asleep is referred for a structured, multi-session behavioral treatment that addresses maladaptive sleep-related thoughts and behaviors (such as excessive time in bed and irregular sleep schedule) rather than being started on a sedative-hypnotic medication. What treatment is this?

- A. Standard sleep hygiene education alone, as a single-session intervention
- B. Cognitive behavioral therapy for insomnia (CBT-I)
- C. Progressive muscle relaxation used as monotherapy for insomnia

85. A patient with chronic pain reports that meeting regularly with other patients facing similar chronic pain challenges, sharing coping strategies and emotional support in a facilitated group setting, has been an important part of their overall treatment plan. What is this treatment component called?

- A. Individual psychodynamic psychotherapy
- B. Biofeedback training
- C. Peer support/group therapy for chronic pain

86. A patient with chronic pain undergoes a treatment in which a trained clinician guides them into a focused state of relaxed attention and heightened suggestibility, then uses therapeutic suggestions to alter the patient's perception of pain intensity. What treatment modality is this?

- A.** Clinical hypnosis/hypnotherapy for pain management
- B.** Standard cognitive-behavioral therapy without a trance-induction component
- C.** Transcutaneous electrical nerve stimulation

87. A physical therapist evaluates a patient with low back pain by having them perform repeated movements in different directions (flexion, extension) to identify a specific direction that centralizes or reduces the patient's leg pain, then prescribes a home exercise program emphasizing that specific directional movement. What treatment approach is this?

- A.** Generic core stabilization exercise, given without any directional assessment
- B.** Passive ultrasound therapy, applied without patient movement
- C.** The McKenzie method (mechanical diagnosis and therapy), using directional preference exercise

88. An occupational health specialist evaluates a worker's desk setup, chair height, monitor position, and repetitive task patterns, then recommends specific adjustments to reduce mechanical strain contributing to the worker's chronic neck and upper back pain. What intervention category does this represent?

- A.** Pharmacologic intervention
- B.** Ergonomic workplace modification
- C.** Interventional nerve block

89. A worker with a permanent partial disability from a chronic pain condition that prevents return to their prior physically demanding job is referred to a specialist who assesses transferable skills, provides job retraining, and assists with job placement in a less physically demanding role. What service is this?

- A.** Vocational rehabilitation counseling
- B.** Functional capacity evaluation
- C.** Acute pain service consultation

90. A patient with chronic low back pain is evaluated by a physician trained in a system of hands-on diagnosis and treatment that includes soft tissue techniques, myofascial release, and gentle mobilization, based on a philosophy that the musculoskeletal system, nervous system, and other body systems are interconnected. What treatment approach is this?

- A.** Osteopathic manipulative treatment (OMT)
- B.** Radiofrequency ablation of the medial branch nerve
- C.** Intrathecal drug delivery

91. A physical therapist treats a patient's myofascial trigger point by inserting a thin, solid filiform needle directly into the taut band of muscle, without injecting any medication, aiming to elicit a local twitch response and reduce muscle tension. How does this technique differ mechanistically from traditional acupuncture?

- A.** It is mechanistically and philosophically identical to acupuncture in every conceivable respect, differing only by license
- B.** It requires injecting a local anesthetic medication with every single needle placement performed, unlike acupuncture
- C.** Dry needling targets trigger points via a Western neuromuscular twitch-response rationale, distinct from meridian theory

92. A patient with fibromyalgia is referred to a mind-body practice involving slow, flowing movements coordinated with breath and focused attention, similar in some respects to tai chi but originating from a distinct traditional Chinese practice emphasizing cultivation of internal energy (qi). Which practice is this?

- A.** Traditional Swedish massage, a passive manual therapy technique performed entirely by a therapist on the patient
- B.** Qigong, a traditional Chinese mind-body practice of slow movement, breath, and focused attention
- C.** Standard resistance weight training exercise, a distinct active exercise modality focused on muscular strength

93. A patient preparing for a painful procedure is guided by a clinician to visualize a calm, peaceful scene in vivid sensory detail, engaging sight, sound, and touch, as a technique to reduce anticipatory anxiety and procedural pain perception. What technique is this?

- A.** Cognitive restructuring targeting catastrophic thought patterns
- B.** Operant behavioral reinforcement of pain behaviors
- C.** Guided imagery, a relaxation technique using structured, vivid mental visualization

94. A hospitalized patient with chronic pain is offered a structured session with a trained therapist using live or recorded music, rhythmic entrainment, and active or receptive musical engagement as an adjunct to reduce pain perception and anxiety during a prolonged hospital stay. What is this treatment called?

- A.** Music therapy, a structured therapeutic modality
- B.** Standard biofeedback using surface EMG
- C.** Transcutaneous electrical nerve stimulation

95. An occupational therapist evaluates a patient with chronic hand pain and weakness and recommends a specialized ergonomic tool with a built-up, cushioned grip to reduce the force required for gripping during daily activities, along with other adaptive tools for the kitchen and workplace. What category of intervention does this represent?

- A.** Pharmacologic adjuvant therapy, a medication-based approach
- B.** Interventional nerve block, a needle-based procedure
- C.** Assistive device/adaptive equipment prescription

96. A physical therapist treats a patient with chronic low back pain using an integrated approach that combines targeted movement retraining with explicit cognitive and behavioral strategies addressing the patient's specific pain beliefs, fears, and unhelpful movement patterns, individualized to that patient's particular psychosocial and physical presentation. What treatment approach does this represent?

- A.** Cognitive functional therapy, an individualized biopsychosocial approach combining movement retraining with targeted cognitive-behavioral strategies
- B.** Standard passive modality therapy using heat and ultrasound alone, without any cognitive-behavioral component whatsoever

C. Isolated corticosteroid injection performed without any accompanying rehabilitative component at all

97. A patient with acute mechanical low back pain seeks care from a licensed practitioner who uses high-velocity, low-amplitude manual thrust techniques to the spine, working within a distinct professional scope of practice separate from physical therapy or osteopathic medicine, though with some overlapping manual techniques. What type of practitioner is this?

- A.** A clinical psychologist, providing psychological therapy
- B.** A chiropractor, whose scope of practice centers on spinal manipulation
- C.** An occupational therapist, focused on daily activities

98. A patient with chronic pain asks about trying a complementary therapy in which a practitioner claims to channel healing energy through light touch or near-touch of the hands, without any manipulation of tissue or established physiologic mechanism. The physician explains that rigorous clinical evidence for this specific therapy remains limited. Which therapy is being described?

- A.** Therapeutic massage with well-defined myofascial mechanisms involving direct manual soft tissue manipulation
- B.** Acupuncture with a defined meridian-based theoretical framework
- C.** Reiki, an energy-healing modality with a proposed mechanism that lacks established physiologic evidence

99. A patient with chronic pain and associated anxiety is taught a technique involving slow, deep breaths that expand the abdomen rather than the chest, engaging the diaphragm, to activate the parasympathetic nervous system and reduce physiologic arousal. What technique is this?

- A.** Diaphragmatic breathing (deep breathing relaxation training)
- B.** Standard aerobic cardiovascular exercise training
- C.** Transcutaneous electrical nerve stimulation

100. A patient with phantom limb pain after below-knee amputation is treated with a technique in which the patient positions a mirror to reflect the image of their intact limb in the space where the amputated limb would be, then performs movements of the intact limb while watching its mirrored reflection,

aiming to reduce the perceived pain in the phantom limb through visual feedback. What is this technique called?

- A.** Standard progressive muscle relaxation performed entirely without any visual feedback or mirror-based component
- B.** Mirror therapy, using visual feedback from the intact limb to reduce phantom limb pain perception
- C.** Transcutaneous electrical nerve stimulation applied directly to the residual limb via skin electrodes

101. A medical student asks how the field of pain medicine formally defines "pain" itself, noting that the definition must account for both the sensory and emotional dimensions of the experience, as well as pain that occurs without any identifiable tissue damage. Which of the following correctly reflects the current formal, widely adopted definition of pain?

- A.** Pain is defined strictly as the neural signal generated by nociceptor activation, independent of any conscious perception
- B.** Pain is defined exclusively as a symptom that always indicates ongoing structural tissue damage
- C.** Pain is an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage

102. A researcher explains that a sedated, unconscious patient can still exhibit measurable neural activity in nociceptive pathways in response to a noxious stimulus, but this does not mean the patient is experiencing "pain" in the way we define it clinically. What conceptual distinction is being illustrated?

- A.** Nociception (the neural process of encoding noxious stimuli) versus pain (the conscious, subjective experience), which are related but distinct concepts
- B.** There is no meaningful distinction between nociception and pain; the terms are fully interchangeable in all contexts
- C.** Nociception only occurs in conscious patients, so an unconscious patient cannot generate any nociceptive signal at all

103. Epidemiologic studies of chronic widespread pain conditions consistently find a substantially higher prevalence among women than men, along with an increased risk associated with certain

psychosocial stressors and a family history of similar conditions. What does this epidemiologic pattern illustrate?

- A.** Chronic widespread pain occurs with equal prevalence and identical risk factors in men and women, with no meaningful sex-based epidemiologic differences
- B.** Chronic widespread pain conditions show a well-documented female predominance along with recognized psychosocial and familial/genetic risk factors
- C.** Chronic widespread pain is caused exclusively by a single identified genetic mutation with complete, deterministic penetrance

104. A patient with fibromyalgia is also found to have irritable bowel syndrome, temporomandibular disorder, and chronic tension headache, all of which are now understood to share overlapping central sensitization mechanisms and frequently co-occur in the same individuals. What concept does this clustering of conditions illustrate?

- A.** These conditions are entirely unrelated and their co-occurrence in this patient is purely coincidental
- B.** This clustering indicates the patient has a single unified autoimmune disease affecting multiple organ systems
- C.** Overlapping central sensitivity syndromes, a recognized clustering of conditions thought to share underlying central sensitization mechanisms

105. A patient presents to the emergency department with acute abdominal pain of unclear cause. A junior resident hesitates to give analgesia before the surgical team evaluates the patient, citing concern that pain relief might mask peritoneal signs and delay diagnosis of a surgical abdomen. What does current evidence say about this practice?

- A.** Appropriately titrated analgesia does not obscure the exam or delay diagnosis; early treatment is now recommended
- B.** This is correct current practice, and analgesia should always be withheld until a definitive surgical diagnosis is established
- C.** Analgesia should be withheld only in pediatric patients with abdominal pain, but is otherwise unrestricted in adults generally

106. A patient with known severe obstructive sleep apnea is undergoing major surgery, and the anesthesia and surgical teams plan a multimodal, opioid-minimizing postoperative analgesic strategy with continuous pulse oximetry monitoring. What is the primary rationale for this heightened caution in this specific patient population?

- A.** Patients with OSA have no increased sensitivity to opioid-induced respiratory depression compared to the general population
- B.** Patients with OSA have increased susceptibility to opioid-induced respiratory depression and airway obstruction, warranting opioid-minimizing strategies and enhanced monitoring
- C.** OSA patients require higher, not lower, opioid doses to achieve adequate analgesia due to increased opioid metabolism

107. A patient in the immediate days following a traumatic below-knee amputation reports pain localized to the actual surgical incision site, distinct from any sensation perceived as coming from the absent foot. How is this early postoperative pain distinguished from phantom limb sensation?

- A.** Residual limb pain is localized to the surgical site, distinct from phantom sensation from the absent limb
- B.** Residual limb pain and phantom limb sensation are the same clinical entity and cannot be meaningfully distinguished at all
- C.** Residual limb pain never occurs in the immediate postoperative period and only develops years after amputation surgery

108. A patient requiring chest tube insertion for a traumatic pneumothorax receives local infiltration of anesthetic along the planned insertion tract and intercostal space before the procedure, in addition to systemic analgesia, to reduce procedural pain. What is the rationale for this local/regional component?

- A.** Local infiltration alone provides complete surgical-level anesthesia for the entire chest without any need for systemic analgesia at any point
- B.** Local infiltration along the insertion tract and intercostal space reduces the acute procedural pain of tube placement itself, complementing rather than replacing systemic analgesia
- C.** Local infiltration is used exclusively to prevent pneumothorax recurrence, with no analgesic benefit

109. A facility performing procedural sedation classifies the depth of sedation for each case using a standardized framework ranging from minimal sedation (anxiolysis) through moderate sedation, deep sedation, and general anesthesia, with specific monitoring requirements defined for each level. What is the purpose of this standardized classification system?

- A.** Escalating sedation levels with matched required monitoring intensity, since compromise risk rises at each level
- B.** To determine which insurance billing code applies, with no actual bearing on patient monitoring requirements whatsoever
- C.** To classify only pediatric sedation cases, since this framework does not apply to adult procedural sedation at all

110. A burn team calculates a patient's total body surface area (TBSA) burned using a standardized method, noting that a larger TBSA burn is generally associated with more extensive background pain, greater fluid resuscitation needs, and a more complex overall analgesic plan spanning background and procedural pain components. What does this illustrate about burn injury severity and pain management planning?

- A.** TBSA burned correlates with overall injury severity and helps guide the anticipated intensity and complexity of the analgesic plan, alongside fluid resuscitation needs
- B.** TBSA calculation has no relationship whatsoever to expected pain severity or analgesic planning
- C.** TBSA is used solely to calculate antibiotic dosing and has no connection to fluid resuscitation or pain management

111. A patient with a continuous peripheral nerve catheter for postoperative analgesia develops increasing erythema, warmth, and purulent drainage at the catheter insertion site several days after placement. What complication should be suspected, and what is the appropriate initial action?

- A.** This is an expected, benign finding requiring no action and continued catheter use
- B.** This represents local anesthetic systemic toxicity, requiring immediate lipid emulsion therapy
- C.** Catheter site infection is suspected; the catheter should be removed and the site evaluated, with antibiotic therapy considered as indicated

112. A trauma team evaluating a patient with multiple rib fractures uses a validated scoring tool incorporating the patient's age, number of rib fractures, and presence of bilateral fractures to estimate the

risk of subsequent pulmonary complications and guide the intensity of pain management and monitoring. What does this scoring tool help determine?

- A.** The exact surgical fixation technique required for every single rib fracture patient, regardless of other clinical factors
- B.** The patient's eligibility for outpatient management regardless of the fracture pattern or any other individual risk factors
- C.** A risk stratification for pulmonary complications that helps guide the intensity of analgesic management and monitoring (e.g., regional analgesia, ICU-level monitoring) in higher-risk patients

113. A patient with a severe traumatic brain injury and depressed level of consciousness cannot reliably self-report pain using a standard numeric scale, and typical behavioral pain scales designed for other populations may be confounded by the patient's underlying neurologic injury itself. What does this illustrate about pain assessment in this population?

- A.** Pain assessment is genuinely impossible in this population and should therefore not be attempted at all, ever
- B.** TBI-related altered consciousness and communication present unique challenges for pain assessment, requiring careful, population-aware use or adaptation of behavioral observation tools
- C.** Standard numeric self-report scales work equally well in TBI patients with depressed consciousness as in fully alert patients

114. An emergency department implements training for staff on recognizing that many trauma patients have prior histories of adversity or trauma exposure, and adjusts communication style, environment, and care delivery to avoid re-traumatization while still providing effective acute pain treatment. What framework does this represent?

- A.** Standard universal precautions screening for opioid misuse risk
- B.** A purely pharmacologic protocol with no communication or environmental component
- C.** Trauma-informed care principles applied to acute pain management

115. An ambulatory surgery center develops a standardized discharge plan for minor outpatient procedures emphasizing scheduled acetaminophen and NSAID dosing, cold therapy, and activity modification, reserving opioid prescriptions only for cases where non-opioid measures are expected to be clearly inadequate. What is the rationale for this discharge approach?

- A.** This approach is used solely to reduce the facility's medication costs, with no consideration of patient safety
- B.** A structured non-opioid-first discharge bundle can provide adequate analgesia for many minor procedures while minimizing unnecessary opioid exposure and leftover pills available for misuse or diversion
- C.** This approach requires every patient to receive an opioid prescription regardless of procedure type, contradicting the premise of the vignette

116. A patient presents with an acute, painful vesicular rash in a dermatomal distribution, and is diagnosed with acute herpes zoster. The physician starts an antiviral agent and also addresses the significant acute pain associated with the active rash. What is an important goal of early, adequate acute pain control in this setting, beyond immediate comfort?

- A.** Adequate acute pain control during the active zoster episode is thought to help reduce the risk of, or severity of, subsequent postherpetic neuralgia, in addition to providing immediate comfort
- B.** Acute pain control during active zoster has been shown to have no relationship whatsoever to subsequent postherpetic neuralgia risk
- C.** Antiviral therapy alone is sufficient and analgesic treatment during the acute phase provides no additional benefit

117. A child requires a brief, mildly painful procedure such as laceration repair, and the emergency physician offers a self-administered gas mixture delivered through a mask, providing rapid-onset anxiolysis and mild analgesia with a very short recovery time once the mask is removed, as an alternative to deeper sedation. Which agent is this?

- A.** Nitrous oxide (inhaled nitrous oxide/oxygen mixture)
- B.** Intravenous ketamine dissociative sedation
- C.** Intravenous propofol deep sedation

118. A patient reports neck pain radiating down the arm in a dermatomal distribution, reproduced when the examiner passively extends and laterally rotates the patient's neck toward the symptomatic side while applying gentle downward pressure on the head. What condition and clinical test does this describe?

- A.** Lumbar radiculopathy, confirmed by a positive straight leg raise test

- B.** Cervical myelopathy, confirmed by a positive Hoffman sign
- C.** Cervical radiculopathy, confirmed by a positive Spurling test

119. A patient reports neck pain that worsens with cervical extension and rotation and improves with flexion, with tenderness over the posterior cervical facet joints on exam, without arm radiation. Which structure is the likely pain generator?

- A.** The cervical intervertebral disc
- B.** The cervical facet (zygapophyseal) joint
- C.** The cervical nerve root

120. A patient wakes up with acute neck pain and is unable to turn their head, holding it tilted to one side with the chin rotated to the opposite side, without any preceding trauma, red-flag symptoms, or neurologic deficit. What condition does this presentation most likely represent?

- A.** Cervical spinal cord injury requiring emergent imaging and evaluation, given significant neurologic deficit findings
- B.** Acute torticollis (wry neck), typically from acute muscular/soft-tissue strain without a serious underlying cause
- C.** Cervical facet joint septic arthritis, an infectious process with systemic signs of infection present

121. A young athlete reports deep shoulder pain and a catching or popping sensation with overhead activity, with exam findings suggestive of injury to the fibrocartilaginous rim surrounding the glenoid, at the attachment site of the long head of the biceps tendon. What condition does this represent?

- A.** Adhesive capsulitis with global range of motion loss
- B.** Acromioclavicular joint separation
- C.** Superior labral tear from anterior to posterior (SLAP lesion)

122. A patient reports anterior shoulder pain, worse with resisted elbow flexion and forearm supination, with tenderness to palpation along the bicipital groove. What condition does this presentation describe?

- A.** Subacromial impingement with a positive Hawkins test

- B.** Biceps tendinopathy, from overuse injury of the long head of the biceps tendon
- C.** Adhesive capsulitis with global motion restriction

123. A patient with chronic shoulder pain is observed to have abnormal, asymmetric movement of the shoulder blade during arm elevation, with the medial or inferior border of the scapula prominently winging away from the thorax. What term describes this abnormal scapular movement pattern, often contributing to secondary shoulder impingement symptoms?

- A.** Adhesive capsulitis
- B.** Scapular dyskinesis
- C.** Acromioclavicular joint separation

124. A patient reports knee pain and a sensation of catching or locking after a twisting injury during sports, with pain reproduced by the examiner passively flexing and extending the knee while applying rotational stress and palpating the joint line. What structure is likely injured, and what is this provocative test called?

- A.** The anterior cruciate ligament, assessed with the Lachman test
- B.** The lateral collateral ligament, assessed with varus stress testing
- C.** The meniscus, assessed with the McMurray test

125. A patient sustains a noncontact pivoting knee injury during sports, hears a pop, and develops immediate swelling and a sensation of instability. The examiner performs a maneuver applying anterior force to the proximal tibia with the knee flexed to about 20-30 degrees, noting increased anterior translation compared to the uninjured side. What structure is injured, and what is this test called?

- A.** The anterior cruciate ligament, assessed with the Lachman test
- B.** The meniscus, assessed with the McMurray test
- C.** The posterior cruciate ligament, assessed with the posterior drawer test

126. A runner reports sharp lateral knee pain that worsens specifically during the repetitive flexion-extension of running, particularly as the foot strikes the ground, with point tenderness over the lateral femoral epicondyle. What condition does this presentation describe?

- A.** Iliotibial band syndrome, from friction of the IT band over the lateral femoral epicondyle during repetitive knee flexion-extension
- B.** Patellofemoral pain syndrome, with pain localized specifically to the anterior aspect of the knee
- C.** Baker's cyst, with pain and swelling localized specifically to the posterior aspect of the knee

127. A patient with underlying knee osteoarthritis reports a soft, fluctuant swelling in the posterior knee (popliteal fossa), which becomes more prominent with knee extension and can cause a sensation of tightness or fullness behind the knee. What condition does this represent?

- A.** Iliotibial band syndrome, with lateral knee pain from friction over the lateral femoral epicondyle
- B.** Anterior cruciate ligament tear, with anterior knee instability following an acute pivoting injury
- C.** Baker's cyst (popliteal cyst), a fluid-filled swelling in the posterior knee often associated with underlying joint pathology

128. A young, active patient reports anterior knee pain that worsens with prolonged sitting ("theater sign"), squatting, and climbing stairs, with tenderness to palpation around the patella but no effusion or mechanical locking. What condition does this presentation describe?

- A.** Meniscal tear with mechanical locking and catching symptoms following a twisting knee injury
- B.** Patellofemoral pain syndrome, related to abnormal patellar tracking and loading
- C.** Baker's cyst with posterior knee swelling and a sensation of fullness behind the knee

129. A patient reports sharp, burning pain and a sensation of "walking on a pebble" localized to the ball of the foot between the third and fourth toes, worsened by tight, narrow-toed shoes. What condition does this presentation describe?

- A.** Plantar fasciitis, with characteristic first-step morning heel pain and point tenderness
- B.** Morton's neuroma, a benign enlargement of the interdigital nerve, classically between the third and fourth toes
- C.** Achilles tendinopathy, with posterior ankle pain localized along the tendon itself

130. A patient reports chronic pain and a visible bony prominence at the base of the great toe, with progressive lateral deviation of the toe, worsened by tight, narrow footwear. What condition does this describe?

- A.** Hallux valgus (bunion), a progressive deformity with lateral deviation of the great toe and a prominent medial first metatarsal head
- B.** Morton's neuroma, with burning pain specifically located between the third and fourth toes
- C.** Plantar fasciitis, with heel pain that is characteristically worst on first morning steps

131. An older adult with chronic thoracic spine stiffness, but relatively little pain, is found on imaging to have flowing calcification and ossification along the anterolateral aspect of multiple contiguous vertebral bodies, with relatively preserved disc height and no significant sacroiliac joint erosion. What condition does this represent?

- A.** Ankylosing spondylitis, with sacroiliac joint erosion as a hallmark early diagnostic finding on imaging
- B.** Diffuse idiopathic skeletal hyperostosis (DISH), characterized by flowing anterolateral vertebral body ossification with preserved disc height
- C.** Osteoporotic vertebral compression fracture, with acute vertebral height loss

132. An elderly patient with chronic axial low back pain worsened by extension reports pain relief with flexion, and imaging shows adjacent, closely opposed lumbar spinous processes with reactive bony changes at the point of contact ("kissing spines"). What condition does this describe?

- A.** Lumbar disc herniation with nerve root compression symptoms
- B.** Sacroiliac joint dysfunction, a mechanical pain source
- C.** Baastrup's disease, from close approximation and contact of adjacent spinous processes

133. A young adult reports inflammatory-pattern low back and buttock pain with morning stiffness, and imaging shows bilateral sacroiliac joint erosion and sclerosis with early fusion, in the context of an underlying inflammatory spondyloarthropathy. How does this inflammatory sacroiliac joint involvement differ from mechanical sacroiliac joint dysfunction?

- A.** Inflammatory sacroiliitis shows erosion, sclerosis, and fusion from spondyloarthropathy, unlike mechanical dysfunction

- B.** Inflammatory sacroiliitis and mechanical SI joint dysfunction are radiographically and clinically identical in every single respect
- C.** Mechanical SI joint dysfunction always shows more severe joint erosion on imaging than inflammatory sacroiliitis

134. A patient with chronic joint pain is found to have diffuse swelling of an entire finger (a "sausage digit"), nail pitting, and onycholysis, along with a history of a scaly skin rash on the elbows and scalp. What underlying condition does this presentation suggest?

- A.** Psoriatic arthritis, with characteristic dactylitis (sausage digit) and nail changes accompanying psoriatic skin disease
- B.** Osteoarthritis, with typical Heberden and Bouchard nodes but no skin or nail involvement
- C.** Gout, with an acute monoarticular flare and no chronic dactylitis

135. A young adult develops asymmetric joint pain and swelling in the knees and ankles approximately two to four weeks after an episode of gastrointestinal or genitourinary infection, along with conjunctivitis and urethritis. What condition does this triad suggest?

- A.** Rheumatoid arthritis, with symmetric small joint involvement and positive rheumatoid factor
- B.** Reactive arthritis, a post-infectious inflammatory arthritis classically associated with conjunctivitis and urethritis
- C.** Osteoarthritis, a degenerative process unrelated to any preceding infection

136. An older patient reports progressive difficulty fully extending the ring and small fingers, with a palpable thickened cord and nodule in the palm at the base of the affected fingers, without pain but with increasing functional limitation. What condition does this describe?

- A.** Dupuytren's contracture, from progressive palmar fascia thickening and fibrosis causing finger flexion contracture
- B.** Carpal tunnel syndrome, with median nerve entrapment causing numbness
- C.** De Quervain tenosynovitis, with radial wrist pain reproduced by the Finkelstein test

137. An elderly patient with progressive lateral spinal curvature on imaging, developing gradually over years due to asymmetric disc and facet degeneration rather than a childhood-onset structural curve, reports chronic low back pain with associated leg symptoms from resultant spinal stenosis. What condition does this describe?

- A.** Adolescent idiopathic scoliosis, a structural curve with childhood or adolescent onset and a different mechanism
- B.** Ankylosing spondylitis with a bamboo spine appearance
- C.** Adult degenerative (de novo) scoliosis, arising from age-related asymmetric disc and facet degeneration

138. A patient reports a soft, round, fluctuant swelling on the dorsal aspect of the wrist that increases in size with wrist flexion and fluctuates over time, without significant pain except with certain wrist positions. What condition does this describe?

- A.** De Quervain tenosynovitis, with radial-sided pain reproduced by the Finkelstein test
- B.** Dupuytren's contracture, with a palmar cord and finger flexion contracture
- C.** Ganglion cyst, a fluid-filled swelling arising from a joint capsule or tendon sheath, classically on the dorsal wrist

139. A young dancer reports an audible or palpable snapping sensation at the hip with certain movements, such as rising from a chair or swinging the leg, without significant pain in most cases, attributed to a tendon or muscle sliding over a bony prominence. What condition does this describe?

- A.** Snapping hip syndrome, from a tendon (commonly the iliotibial band or iliopsoas) sliding over an adjacent bony prominence
- B.** Greater trochanteric pain syndrome, with lateral hip point tenderness and pain lying on that side
- C.** Meralgia paresthetica, with anterolateral thigh numbness from lateral cutaneous nerve entrapment

140. A new runner who recently increased training mileage reports diffuse aching pain along the inner border of the shin, worse with activity and improving with rest, without a focal point of severe tenderness or evidence of fracture on exam. What condition does this describe?

- A.** Stress fracture, with a focal point of severe bony tenderness

B. Medial tibial stress syndrome ("shin splints"), from repetitive stress to the tibial periosteum and surrounding soft tissue

C. Chronic exertional compartment syndrome, with pain specifically relieved by rest but recurring predictably at a consistent exercise threshold

141. A long-distance runner reports focal, worsening shin pain over several weeks, now present even with walking, with a specific point of severe tenderness on exam and no history of a single traumatic event. Imaging eventually confirms a small linear fracture line without cortical disruption. What condition does this describe?

A. Medial tibial stress syndrome, with diffuse, non-focal tenderness

B. Stress fracture, from repetitive submaximal loading exceeding the bone's capacity for repair

C. Chronic exertional compartment syndrome, with symptoms specifically tied to a reproducible exercise threshold

142. A young athlete reports reproducible lower leg pain, tightness, and numbness that reliably begins after a consistent, predictable duration of running and resolves within minutes of stopping exercise, with normal exam findings between episodes. What condition does this presentation suggest?

A. Acute compartment syndrome, a surgical emergency requiring immediate fasciotomy and continuous severe pain

B. Medial tibial stress syndrome, with diffuse aching that persists after exercise stops

C. Chronic exertional compartment syndrome, with symptoms reliably provoked at a reproducible exercise threshold and resolving with rest

143. A palliative care physician evaluating a patient with advanced cancer pain assesses not only the physical nociceptive and neuropathic components of the pain, but also the patient's psychological distress, social isolation from illness, and existential or spiritual suffering, recognizing that all of these dimensions contribute to the patient's overall suffering. What concept does this comprehensive assessment reflect?

A. The WHO analgesic ladder, a purely pharmacologic stepwise framework for medication escalation

B. Mirels' criteria, a fracture risk scoring system for orthopedic oncology decision-making

C. The concept of "total pain," recognizing physical, psychological, social, and spiritual dimensions of suffering in serious illness

144. A patient with lung cancer (Pancoast tumor) develops progressive shoulder and arm pain, weakness, and sensory loss in a pattern involving multiple nerve roots of the brachial plexus, attributed to direct tumor invasion of the plexus rather than a single nerve root lesion. What condition does this represent?

- A. Simple cervical radiculopathy from a single-level disc herniation
- B. Malignant brachial plexopathy, from direct tumor invasion of the brachial plexus
- C. Carpal tunnel syndrome from median nerve entrapment

145. A patient who underwent mastectomy and axillary lymph node dissection for breast cancer develops persistent burning, aching pain in the chest wall, axilla, and medial upper arm months after surgery, in the absence of cancer recurrence. What condition does this represent?

- A. Postmastectomy pain syndrome, a chronic neuropathic pain condition following breast cancer surgery
- B. Acute postoperative incisional pain, expected to resolve within the first postoperative week
- C. Malignant brachial plexopathy from tumor recurrence

146. A patient who underwent thoracotomy for lung cancer resection develops persistent burning pain along the surgical incision and chest wall, in the distribution of the intercostal nerves, that continues for several months after surgery, unrelated to any recurrent tumor. What condition does this represent?

- A. Post-thoracotomy pain syndrome, a chronic neuropathic pain condition from intercostal nerve injury during thoracic surgery
- B. Acute pleuritic chest pain from a new pneumonia infection, with fever and a new radiographic infiltrate
- C. Malignant pleural effusion causing chest wall pressure

147. A patient undergoing chemotherapy develops severe, painful ulceration of the oral mucosa, making it difficult to eat, drink, or take oral medications, attributed to direct cytotoxic injury to rapidly dividing

mucosal cells from the chemotherapy regimen. What condition does this represent, and what does it illustrate about cancer pain management?

- A.** Chemotherapy-induced peripheral neuropathy, a distal sensory nerve complication unrelated to the oral cavity itself
- B.** Malignant bowel obstruction, presenting with colicky abdominal pain
- C.** Chemotherapy-induced oral mucositis, showing treatment toxicity itself as an underrecognized cancer pain source

148. A patient who completed curative treatment for cancer several years ago and has no evidence of recurrent disease continues to experience chronic pain related to lasting effects of surgery, radiation, or chemotherapy received during treatment. What does this scenario illustrate about pain in the cancer survivorship population?

- A.** Chronic pain never persists after successful cancer treatment; any pain reported in a cancer survivor must indicate recurrent disease until proven otherwise
- B.** Cancer survivorship pain is managed using an entirely different physiologic pain mechanism unrelated to any principle applicable to other chronic pain populations
- C.** Cancer survivors can experience persistent chronic pain from lasting treatment effects (surgical, radiation, or chemotherapy-related) even after successful cure, representing a distinct clinical population requiring ongoing pain management attention

149. An elderly patient with a history of both osteoporosis and a known malignancy presents with a new vertebral compression fracture. The radiologist notes specific imaging features -- involvement of the posterior vertebral body element (pedicle), an associated soft tissue mass, and multiple non-contiguous lesions -- that raise concern for a pathologic fracture from metastatic disease rather than a simple osteoporotic fracture. What does this illustrate?

- A.** Osteoporotic and metastatic vertebral compression fractures are radiographically indistinguishable in all cases, and additional imaging is never helpful
- B.** Certain imaging features can help distinguish a pathologic fracture from a simple osteoporotic compression fracture
- C.** Only bone biopsy, never any imaging characteristics, can ever help distinguish these two clinical entities from each other

150. A patient who received radiation therapy to the chest wall and axilla for breast cancer years ago now develops progressive arm pain, weakness, and sensory changes in the brachial plexus distribution. The clinical team must distinguish between radiation-induced plexopathy and tumor recurrence causing malignant plexopathy. Which clinical feature more classically favors radiation-induced plexopathy over tumor recurrence?

- A.** Radiation plexopathy is more painless with progressive weakness; malignant plexopathy features severe early pain
- B.** Radiation-induced plexopathy always occurs within days of completing radiation therapy, while tumor recurrence never causes plexopathy at any interval
- C.** There is no clinically useful way to distinguish these two entities, and the distinction has no bearing on management decisions

151. A patient with a large mediastinal mass from lymphoma develops facial and upper extremity swelling, distended neck veins, and a sensation of chest fullness and pressure, attributed to compression of a major vessel returning blood from the head, neck, and arms to the heart. What does this vessel compression syndrome represent, and how might it relate to cancer-associated pain and pressure symptoms?

- A.** Malignant epidural spinal cord compression, requiring urgent MRI and corticosteroids
- B.** Chemotherapy-induced peripheral neuropathy, a distal sensory complication unrelated to central vascular compression
- C.** Superior vena cava syndrome, from compression of the superior vena cava producing venous congestion, facial/arm swelling, and pressure-related discomfort

152. A patient with metastatic breast cancer develops progressive, diffuse headache worse with position changes, along with cranial nerve palsies and altered mental status, and lumbar puncture reveals malignant cells in the cerebrospinal fluid. What condition does this represent?

- A.** Leptomeningeal carcinomatosis, from metastatic seeding of the meninges producing headache and diffuse neurologic dysfunction
- B.** Simple tension-type headache, entirely unrelated to the underlying malignancy or any structural process
- C.** Medication overuse headache from frequent analgesic use

153. Multiple studies have documented that cancer pain remains undertreated in certain patient populations, including racial and ethnic minorities and patients in resource-limited settings, even when controlling for pain severity and cancer type. What does this body of evidence illustrate about cancer pain management?

- A.** Cancer pain undertreatment disparities do not exist and have never been documented anywhere in the medical literature
- B.** Undertreatment disparities are fully explained by differences in cancer type alone, with no role for other factors
- C.** Documented treatment disparities across populations highlight persistent access and equity barriers in cancer pain care

154. A patient with advanced cancer reports that profound fatigue significantly worsens their perception of pain and reduces their engagement in previously helpful coping strategies, while poorly controlled pain also disrupts sleep and further worsens fatigue, creating a self-reinforcing cycle. What does this illustrate about the relationship between cancer-related fatigue and pain?

- A.** Cancer-related fatigue and pain have a bidirectional, mutually reinforcing relationship, such that addressing one symptom in isolation without attention to the other may limit overall symptom control
- B.** Cancer-related fatigue and pain are entirely independent symptoms with no meaningful physiologic or clinical interaction
- C.** Cancer-related fatigue is exclusively a side effect of opioid medication and has no relationship to the underlying malignancy or pain itself

155. A patient develops sudden-onset, severe right upper quadrant pain after a fatty meal, radiating to the right shoulder blade, associated with nausea, without fever or significant tenderness on exam. Ultrasound shows gallstones without evidence of gallbladder wall thickening or pericholecystic fluid. What condition does this presentation describe?

- A.** Acute cholecystitis with gallbladder wall inflammation
- B.** Biliary colic, from transient cystic duct obstruction by a gallstone without associated inflammation
- C.** Acute pancreatitis with elevated lipase levels and epigastric pain radiating to the back

156. A patient with a traumatic splenic injury reports pain not only in the left upper quadrant of the abdomen but also in the left shoulder, without any direct shoulder injury. What phenomenon explains this referred shoulder pain from an abdominal organ injury?

- A.** Direct mechanical compression of the brachial plexus by the injured spleen itself, an anatomically implausible mechanism
- B.** Referred pain from diaphragmatic irritation (Kehr's sign), due to shared phrenic nerve innervation between the diaphragm and shoulder region (C3-C5)
- C.** A coincidental, unrelated rotator cuff injury occurring simultaneously with the abdominal trauma

157. A patient initially reports vague, poorly localized periumbilical pain that, over several hours, migrates to become sharp, well-localized pain in the right lower quadrant, now worsened by movement and associated with localized peritoneal signs. What classic teaching example of pain evolution does this represent?

- A.** Pure somatic pain from the outset, with no visceral component present at any stage of the presentation
- B.** Pure visceral pain throughout, remaining periumbilical and poorly localized without any change in character
- C.** Appendicitis: the classic transition from visceral periumbilical pain to somatic right lower quadrant pain

158. A patient reports burning epigastric pain that occurs primarily 2-3 hours after meals and is relieved by eating or antacids, without radiation to the back, with endoscopy revealing a duodenal ulcer. What condition and pain pattern does this describe?

- A.** Acute pancreatitis, with epigastric pain radiating to the back, worsened rather than relieved by eating
- B.** Biliary colic, with postprandial right upper quadrant pain radiating to the shoulder
- C.** Peptic ulcer disease (duodenal ulcer), with a classic pattern of pain occurring hours after meals and relieved by eating or antacids

159. A patient with longstanding diabetes reports early satiety, postprandial fullness, nausea, and bloating, with a nuclear medicine gastric emptying study confirming delayed gastric emptying in the

absence of any mechanical obstruction. What condition does this represent, and what is the proposed mechanism of the associated discomfort?

- A.** Acute cholecystitis, from gallbladder wall inflammation with fever and significant tenderness present
- B.** Gastroparesis: delayed gastric emptying from vagal neuropathy causing distension, fullness, and bloating
- C.** Peptic ulcer disease, with a mucosal defect visible on endoscopy

160. A woman presents with sudden-onset, severe unilateral lower abdominal/pelvic pain, and imaging reveals a hemorrhagic ovarian cyst that has ruptured, without evidence of ovarian torsion. What is the typical clinical course of pain from a ruptured ovarian cyst compared to ovarian torsion?

- A.** Ruptured ovarian cyst pain is always more severe and prolonged than torsion, requiring emergent surgery in every case
- B.** Ruptured cyst pain is often sudden but self-limited; torsion pain persists without surgical intervention
- C.** There is no clinically meaningful difference in presentation or expected course between these two conditions at all

161. A patient reports chronic, dull rectal pain and a sensation of pressure or fullness, worse with prolonged sitting, without a clear structural anorectal lesion on exam, attributed to spasm of the pelvic floor muscles surrounding the rectum. What condition does this describe?

- A.** Levator ani syndrome, from chronic spasm of the levator ani pelvic floor muscles
- B.** Proctalgia fugax, with brief, severe, self-limited rectal pain episodes
- C.** Hemorrhoidal disease, with visible external or internal hemorrhoids on exam

162. A patient reports brief, severe episodes of rectal pain, often waking them from sleep, lasting only seconds to a few minutes and then resolving completely, with a normal anorectal exam between episodes and no identifiable structural cause. What condition does this describe?

- A.** Levator ani syndrome, with chronic, dull, positionally-related pain
- B.** Chronic anal fissure, with pain reproduced by defecation and a visible mucosal tear

C. Proctalgia fugax, characterized by brief, severe, self-limited episodes of rectal pain without a structural cause

163. A patient reports continuous, unilateral moderate headache present for over three months, with superimposed exacerbations accompanied by tearing and nasal congestion on the same side, and reports complete resolution of the headache after a therapeutic trial of indomethacin. What diagnosis does this absolute indomethacin responsiveness strongly suggest?

A. Migraine without aura, a distinct episodic headache disorder unrelated to autonomic exacerbations

B. Hemicrania continua, a continuous unilateral headache that is characteristically completely and absolutely responsive to indomethacin

C. Tension-type headache, a typically bilateral, band-like headache without autonomic features

164. A patient reports frequent, severe, strictly unilateral periorbital headache attacks, shorter in duration than typical cluster headache (lasting 2-30 minutes), occurring many times per day, associated with ipsilateral autonomic features, and completely resolving with indomethacin. What condition does this represent?

A. Paroxysmal hemicrania, a trigeminal autonomic cephalalgia with shorter, more frequent attacks than cluster headache, absolutely responsive to indomethacin

B. Classic cluster headache, with attacks lasting 15-180 minutes and no expected indomethacin responsiveness

C. Chronic migraine, with headache present on more than 15 days per month for at least three months

165. A patient reports sharp, shooting pain confined specifically to the distribution of the greater occipital nerve in the posterior scalp, reproduced by direct palpation over the nerve at the nuchal ridge, distinct from a broader headache pattern referred from the cervical spine more generally. How does this presentation differ from cervicogenic headache?

A. Occipital neuralgia and cervicogenic headache are the same condition and cannot be meaningfully distinguished at all

B. Occipital neuralgia is always caused by cervical facet joint pathology, identical in mechanism to cervicogenic headache

C. Occipital neuralgia reflects focal nerve entrapment, distinct from cervicogenic headache's broader referral pattern

166. A young woman with obesity reports a progressively worsening daily headache, worse with straining or lying down, along with transient visual obscurations and pulsatile tinnitus. Fundoscopic exam reveals bilateral papilledema, and lumbar puncture shows an elevated opening pressure with normal cerebrospinal fluid composition and normal brain imaging. What condition does this represent?

A. Idiopathic intracranial hypertension, causing headache from elevated pressure without a mass lesion present

B. Classic migraine with aura, entirely unrelated to intracranial pressure or cerebrospinal fluid dynamics

C. Medication overuse headache from frequent analgesic use

167. A postmenopausal woman reports a persistent burning sensation affecting the tongue and oral mucosa, present for months, with a completely normal oral examination and no identifiable local or systemic cause identified after appropriate workup. What condition does this represent?

A. Burning mouth syndrome, a chronic oral pain condition without an identifiable structural or local cause

B. Trigeminal neuralgia, with brief, electric shock-like facial pain paroxysms

C. Temporomandibular disorder, with jaw joint clicking and muscle tenderness

168. A patient reports chronic, daily, poorly localized facial pain that does not fit the pattern of trigeminal neuralgia, TMD, or any identifiable dental, sinus, or structural cause after extensive negative workup, described as a constant deep ache without clear triggers. What condition does this represent?

A. Classic trigeminal neuralgia, with brief, electric shock-like triggered pain paroxysms and clear trigger zones

B. Persistent idiopathic facial pain, a chronic condition without an identifiable structural or dental cause

C. Acute sinusitis, with purulent nasal discharge and facial pressure

169. A young patient reports progressive distal weakness and sensory loss in the feet and hands, with high-arched feet (pes cavus) and hammer toes, and a family history of similar symptoms in multiple relatives across generations. Nerve conduction studies show markedly reduced conduction velocities. What condition does this presentation suggest?

- A.** Diabetic peripheral neuropathy, an acquired metabolic neuropathy without any hereditary component or pattern
- B.** Guillain-Barre syndrome, an acute autoimmune demyelinating neuropathy
- C.** Charcot-Marie-Tooth disease, a hereditary sensorimotor neuropathy with characteristic foot deformities and a clear family history

170. An elderly patient with a history of strict vegan diet and pernicious anemia develops progressive numbness, tingling, and gait imbalance, along with weakness, and is found to have combined dysfunction of the dorsal columns and corticospinal tracts on exam. Laboratory testing reveals a low serum vitamin B12 level. What condition does this represent?

- A.** Subacute combined degeneration from vitamin B12 deficiency, affecting the dorsal columns and corticospinal tracts
- B.** Alcohol-related peripheral neuropathy from thiamine deficiency in the context of heavy chronic alcohol use
- C.** Charcot-Marie-Tooth disease, a hereditary neuropathy

171. A patient with end-stage renal disease on long-term hemodialysis develops symmetric, distal burning pain, numbness, and restless leg symptoms in a length-dependent pattern. What is this neuropathy attributed to?

- A.** Direct hemodialysis catheter trauma to peripheral nerves themselves, a localized mechanical injury mechanism
- B.** Uremic neuropathy, from the accumulation of uremic toxins in chronic kidney disease affecting peripheral nerve function
- C.** A hereditary neuropathy unrelated to the patient's kidney disease

172. A patient with newly diagnosed small cell lung cancer develops rapidly progressive sensory neuropathy with prominent sensory ataxia, occurring before any chemotherapy has been administered,

and is found to have specific autoantibodies associated with the malignancy. What does this presentation represent?

- A.** Chemotherapy-induced peripheral neuropathy, a treatment-related toxicity occurring after drug exposure
- B.** Paraneoplastic sensory neuropathy, an autoimmune process from malignancy-associated antibodies, pre-treatment
- C.** Diabetic peripheral neuropathy, an acquired metabolic neuropathy unrelated to any malignancy

173. A patient reports episodic, severe burning pain, redness, and warmth of the feet and hands, triggered by warmth or exercise and relieved by cooling or elevation, associated with a gain-of-function mutation in a specific sodium channel gene expressed in peripheral nociceptors. What condition does this represent?

- A.** Raynaud phenomenon, with episodic digital pallor and cyanosis specifically triggered by cold exposure
- B.** Complex regional pain syndrome Type I, following a minor precipitating injury
- C.** Erythromelalgia, from a gain-of-function mutation in the SCN9A sodium channel gene causing episodic burning pain, redness, and warmth

174. A child sustains repeated unnoticed injuries, including burns and fractures, without ever reporting pain, and genetic testing reveals a loss-of-function mutation in the same sodium channel gene implicated in erythromelalgia's gain-of-function mutations. What condition does this represent?

- A.** Complex regional pain syndrome, with heightened rather than absent pain sensitivity
- B.** Congenital insensitivity to pain, from a loss-of-function SCN9A mutation resulting in absent nociceptive signaling
- C.** Diabetic peripheral neuropathy, an acquired condition unrelated to any genetic channelopathy

175. A patient presents with leg pain, numbness, and weakness, and the examining physician must determine whether the findings follow a specific dermatomal/myotomal nerve root distribution (suggesting radiculopathy) or a distal, symmetric, stocking-pattern distribution not following any single nerve root (suggesting peripheral polyneuropathy). What is the key distinguishing clinical feature between these two entities?

- A.** Radiculopathy follows a single nerve root's distribution, while polyneuropathy is symmetric and distal
- B.** Radiculopathy and peripheral polyneuropathy are clinically and electrodiagnostically indistinguishable in absolutely all cases
- C.** Peripheral polyneuropathy always follows a single dermatomal distribution, identical to radiculopathy

176. A patient who suffered a stroke affecting the lateral medulla develops loss of pain and temperature sensation on the ipsilateral face and contralateral body, along with ataxia and other brainstem findings. This dissociated sensory loss pattern, sometimes followed months later by chronic central pain in the affected regions, is associated with which stroke syndrome?

- A.** Anterior cerebral artery infarct, affecting the medial frontal lobe with leg-predominant weakness
- B.** Wallenberg syndrome, producing a characteristic crossed pattern of pain/temperature sensory loss
- C.** Middle cerebral artery infarct, affecting the lateral cerebral hemisphere

177. A patient with a fluid-filled cavity within the spinal cord, confirmed on MRI, develops a characteristic dissociated sensory loss (loss of pain and temperature sensation with preserved light touch and proprioception) in a cape-like distribution over the shoulders and arms, along with chronic burning central pain in that distribution. What condition does this represent?

- A.** Syringomyelia, causing central pain from cavitation of the spinal cord affecting decussating spinothalamic fibers
- B.** Guillain-Barre syndrome, an acute, rapidly progressive peripheral demyelinating autoimmune process
- C.** Carpal tunnel syndrome, a peripheral nerve entrapment

178. A patient develops sudden, severe shoulder and upper arm pain, followed days later by profound weakness of the shoulder girdle muscles once the initial pain begins to subside, without a clear traumatic precipitant, sometimes preceded by a viral illness or vaccination. What condition does this represent?

- A.** Malignant brachial plexopathy from direct tumor invasion, typically with prominent pain as an early feature

B. Cervical radiculopathy from a single-level disc herniation

C. Neuralgic amyotrophy (Parsonage-Turner syndrome): idiopathic brachial plexopathy with pain-then-weakness pattern

179. A patient with known multiple sclerosis reports a sudden, electric shock-like sensation shooting down the spine and into the limbs, specifically triggered by flexing the neck forward. What is this phenomenon called, and what does it suggest about disease location?

A. A normal, expected finding with no relationship whatsoever to the underlying demyelinating disease process

B. Trigeminal neuralgia, related to demyelination of the trigeminal nerve root entry zone

C. Lhermitte's sign: a shock-like sensation from neck flexion, suggesting cervical dorsal column demyelination

180. A patient who underwent lumbar spine surgery for radiculopathy continues to experience persistent burning, radiating leg pain months after the procedure, despite technically successful decompression on imaging, attributed in part to epidural scarring and ongoing nerve root sensitization rather than any new structural problem. What term describes this overall clinical scenario?

A. Failed back surgery syndrome, with a persistent neuropathic pain component despite technically adequate surgical decompression

B. Acute postoperative pain, expected to resolve within the first week after surgery

C. Cauda equina syndrome, an acute surgical emergency requiring immediate re-operation

181. A woman reports chronic burning pain localized to the vulvar vestibule, significantly worsened by attempted penetration or even light touch (such as with a cotton swab test), without any identifiable infectious, dermatologic, or other structural cause after thorough gynecologic evaluation. What condition does this represent?

A. Vulvodynia, a chronic vulvar pain condition without an identifiable underlying cause, often with allodynia to light touch

B. Acute vulvovaginal candidiasis, with visible discharge and erythema along with a positive fungal culture

C. Bartholin gland abscess, with a palpable fluctuant mass

182. Two patients with complex regional pain syndrome present differently: one has a warm, red, swollen affected limb, while the other has a cool, pale, cyanotic-appearing affected limb with reduced hair and nail growth. What does this clinical variability illustrate about CRPS presentation?

- A.** CRPS always presents identically in every patient with a warm, red limb, and any other presentation excludes the diagnosis entirely
- B.** CRPS can present with distinct vasomotor phenotypes -- a "warm" (vasodilated) subtype and a "cold" (vasoconstricted) subtype -- reflecting variability in the underlying autonomic/vasomotor dysfunction
- C.** The cool, pale limb described must represent a completely unrelated diagnosis of acute arterial occlusion rather than any form of CRPS

183. A patient with a peripheral nerve injury involving axonal disruption but preserved surrounding connective tissue structures (axonotmesis) is counseled about the expected timeline for potential nerve regeneration and functional recovery. What is the generally cited rate of peripheral axonal regeneration used to estimate this recovery timeline?

- A.** Approximately 1 millimeter per day (roughly 1 inch per month), used as a general estimate for axonal regeneration along an intact connective tissue scaffold
- B.** Peripheral axons regenerate instantaneously, with full recovery expected within 24 hours of injury
- C.** Peripheral nerve axons never regenerate under any circumstances once axonal disruption has occurred

184. A patient with long-standing diabetes develops orthostatic hypotension, resting tachycardia, gastroparesis, and erectile dysfunction, in addition to the more commonly recognized distal sensory symptoms of diabetic neuropathy. What category of diabetic neuropathy does this constellation of findings represent?

- A.** Diabetic distal symmetric sensorimotor polyneuropathy, affecting only somatic sensory and motor fibers
- B.** Diabetic mononeuropathy, affecting a single isolated peripheral nerve
- C.** Diabetic autonomic neuropathy, affecting autonomic nerve fibers controlling cardiovascular, gastrointestinal, and genitourinary function

185. A pain physician evaluating a patient with a moderate intellectual disability and limited verbal communication adapts the visit by using simple, concrete language, involving a familiar caregiver who knows the patient's typical baseline behavior, and relying more heavily on behavioral observation than complex self-report scales. What does this approach illustrate?

- A.** Standard numeric rating scales are equally effective in this population without any need for adaptation
- B.** Pain cannot be meaningfully assessed at all in patients with intellectual disability, so treatment decisions should be based solely on the underlying diagnosis
- C.** Pain assessment in patients with intellectual/developmental disabilities often requires adapted communication strategies, caregiver input on baseline behavior, and increased reliance on behavioral observation

186. A patient is prescribed codeine for pain and reports minimal analgesic benefit despite an appropriate dose. Pharmacogenomic testing reveals the patient is a CYP2D6 poor metabolizer. How does this genotype explain the patient's poor response to codeine?

- A.** Poor CYP2D6 metabolizers convert codeine to its active metabolite morphine much less efficiently, resulting in reduced analgesic effect from standard codeine dosing
- B.** CYP2D6 poor metabolizer status has no bearing on codeine's analgesic effect, since codeine itself is the active analgesic molecule
- C.** CYP2D6 poor metabolizer status causes codeine to be converted to morphine more rapidly and completely than in normal metabolizers, which should have increased, not decreased, the analgesic effect

187. A patient with stable chronic pain living several hours from the nearest pain clinic is offered follow-up visits conducted via secure video conferencing rather than requiring in-person travel for every visit, with periodic in-person visits still required for physical examination and any needed procedures. What does this approach illustrate about telemedicine in chronic pain management?

- A.** This reflects normal, expected practice with no adaptation of communication strategy required at all for this population
- B.** Telemedicine can improve chronic pain follow-up access for geographically distant patients, with periodic in-person visits still needed
- C.** Telemedicine has no legitimate role in chronic pain management and should never be used for this patient population

188. A patient asks their pain physician about using cannabis products purchased from a state-licensed dispensary in a jurisdiction where cannabis has been legalized for medical or recreational use, for chronic pain management. What is an important consideration for the physician in this discussion, given the current legal and regulatory landscape?

- A.** Cannabis remains illegal at the state level in every single jurisdiction in the United States without exception
- B.** Physicians should avoid any discussion of cannabis use with patients, since it remains entirely unregulated and unstudied
- C.** Cannabis remains a federally controlled substance despite state legalization; discuss evidence, quality, and interactions

189. A pain physician evaluating a new patient who speaks limited English uses a qualified, trained medical interpreter (in person or via a certified telephone/video interpreter service) rather than relying on an accompanying family member to translate complex medical information and obtain informed consent. What is the rationale for this practice?

- A.** Family members are always preferred over professional interpreters because they know the patient better, regardless of accuracy
- B.** Professional interpreter services are entirely optional and used only when convenient, with no meaningful impact on care
- C.** Professional interpreters improve translation accuracy and protect confidentiality and consent quality versus family translation

190. A patient with complex chronic pain living in a rural area must travel over three hours each way to reach the nearest interventional pain specialist, resulting in delayed diagnosis and treatment compared to patients living in urban areas with nearby specialty access. What does this scenario illustrate about pain care delivery?

- A.** Geographic location has no meaningful effect on access to specialized pain care in the modern healthcare system today
- B.** Rural populations often face significant access barriers to specialty pain care, delaying diagnosis and treatment
- C.** Rural patients consistently receive faster access to specialty pain care than urban patients due to lower overall demand in rural areas

191. A patient who had a confirmed COVID-19 infection several months ago now reports persistent widespread musculoskeletal pain, fatigue, and cognitive difficulties that developed after the acute infection resolved, without another clear explanation. What does this presentation represent, and how might it relate to other chronic pain conditions?

- A.** This presentation has no recognized relationship to the prior COVID-19 infection and must represent an entirely coincidental, unrelated new diagnosis
- B.** This presentation is diagnostic of a specific, well-defined structural joint disease directly caused by the SARS-CoV-2 virus itself
- C.** Long COVID-associated chronic pain, a post-infectious syndrome with features overlapping those of other central sensitization/chronic widespread pain conditions, representing an emerging area of clinical attention

192. A pain clinic redesigns its patient education handouts to use plain language, short sentences, larger font, and visual diagrams, avoiding medical jargon, after recognizing that many patients struggle to understand the clinic's original, densely written materials. What patient-care principle does this redesign address?

- A.** Regulatory billing requirements, with no actual bearing on patient understanding or clinical outcomes whatsoever
- B.** Health literacy: designing materials so patients of varying comprehension can understand and self-manage care
- C.** HIPAA privacy requirements, an entirely separate and unrelated regulatory domain from communication clarity

193. A patient experiencing homelessness with chronic pain has difficulty maintaining a consistent medication regimen, attending scheduled follow-up appointments, and safely storing controlled substances, leading the care team to consider alternative approaches such as coordination with a shelter-based case manager and simplified dosing regimens. What does this scenario illustrate?

- A.** Housing status has no meaningful impact on chronic pain management or overall treatment planning at all
- B.** Homelessness creates practical barriers to adherence, appointments, and safe storage, requiring care plan adaptation
- C.** Patients experiencing homelessness should be excluded from chronic pain treatment entirely due to these barriers

194. A patient on gender-affirming hormone therapy is being started on a new medication for chronic pain, and the prescribing physician reviews the patient's current hormone regimen for potential drug interactions, similar to reviewing any other patient's chronic medication list before prescribing. What is the appropriate clinical approach to this consideration?

- A.** Reviewing the full medication list, including hormone therapy, for interactions is standard practice for any patient
- B.** Gender-affirming hormone therapy has no potential for drug interactions with any medication and never needs review
- C.** Pain medications should never be prescribed to any patient taking gender-affirming hormone therapy under any circumstances

195. A patient with a severe intellectual disability and a legally appointed guardian requires a major interventional pain procedure. The physician must obtain informed consent from the legally authorized decision-maker rather than the patient directly, while still explaining the procedure to the patient in an age/ability-appropriate way and seeking their assent where possible. What does this process illustrate?

- A.** Informed consent requirements do not apply at all when a patient lacks full decision-making capacity in this scenario
- B.** The patient's own signature is always legally sufficient for consent, regardless of documented decision-making capacity
- C.** With limited capacity, consent comes from the legal surrogate, while still involving the patient in assent

196. A pain physician routinely asks every patient, at each visit, what complementary or alternative therapies (such as herbal supplements, high-dose vitamins, or other over-the-counter products) they are using, explaining that this information is important for identifying potential interactions and providing complete, coordinated care. What practice does this represent?

- A.** An unnecessary line of questioning with no clinical relevance whatsoever to overall pain management
- B.** Systematic CAM disclosure supports medication reconciliation and identifies potential interactions or safety concerns
- C.** A practice required only for patients who specifically volunteer this information unprompted

197. A pediatric pain clinic begins structured planning several months before a patient with chronic pain turns 18, coordinating a formal transfer of care to an adult pain medicine provider, including a summary of the patient's treatment history and an introductory visit with the new provider. What does this process illustrate?

- A.** Structured transition planning ensures continuity of care and reduces gaps as a patient ages out of pediatric services
- B.** An unnecessary administrative step with no bearing on clinical outcomes for the patient whatsoever
- C.** A process that should occur abruptly on the patient's 18th birthday without any advance planning or coordination

198. A patient with chronic pain reports skipping doses of an effective but expensive medication because they cannot consistently afford the copay, resulting in inconsistent symptom control despite having an appropriate prescription. What does this scenario illustrate, and what is an appropriate physician response?

- A.** This represents intentional medication non-adherence unrelated to any external barrier, requiring only a discussion
- B.** Cost has no meaningful influence on medication adherence in patients with adequate prescription coverage
- C.** Financial toxicity can impair adherence; physicians should explore cost barriers and consider affordable alternatives

199. A patient with a history of Roux-en-Y gastric bypass surgery is prescribed an extended-release oral opioid formulation for chronic pain, and the prescriber recognizes that this specific formulation may have altered, potentially erratic absorption due to the patient's surgically altered gastrointestinal anatomy. What is the clinical concern being addressed?

- A.** Bariatric surgery has no effect on oral medication absorption of any kind, regardless of formulation type
- B.** Altered post-bariatric anatomy can unpredictably alter absorption of certain oral medications, including ER formulations
- C.** Extended-release oral formulations are always the safest and most predictable choice specifically for post-bariatric surgery patients

200. A pain clinic ensures that a deaf patient's visits are scheduled with a certified American Sign Language interpreter present (in person or via video remote interpreting), rather than relying on written notes or lip-reading alone, to ensure the patient can fully participate in discussions about their pain management plan. What does this practice reflect?

- A.** Certified interpreters support full patient participation, understanding, and valid informed consent for deaf patients
- B.** An optional courtesy with no meaningful bearing on the quality of informed consent or care for this patient
- C.** A practice that should be reserved only for patients who explicitly request it, with no proactive obligation on the part of the clinic

Answers

1. C. C fibers are unmyelinated, conduct at under 2 m/s, and mediate the dull, diffuse, poorly localized second-pain sensation that follows the initial sharp pain, matching this vignette precisely. A-beta fibers are large, myelinated, fast-conducting fibers that mediate light touch and proprioception, not pain, so they would not produce either pain sensation described here. A-delta fibers are thinly myelinated and conduct faster than C fibers (5-30 m/s), mediating the initial sharp first pain rather than the delayed, dull second pain described in this vignette.

2. A. Wide dynamic range neurons are defined by their convergent input from both nociceptive and non-nociceptive afferents, allowing them to encode a graded range of stimulus intensities from innocuous touch through noxious pain, matching this vignette exactly. Nociceptive-specific neurons, by contrast, respond only to noxious stimuli and do not receive the convergent non-nociceptive input described in this vignette. Low-threshold mechanoreceptor neurons respond specifically to innocuous mechanical stimuli and do not encode the broad, convergent nociceptive-plus-non-nociceptive range described here.

3. C. Long-term potentiation describes a persistent, activity-dependent strengthening of synaptic transmission that outlasts the inciting stimulus by hours to days, and LTP at dorsal horn synapses is a proposed cellular mechanism contributing to pain chronicity, matching this vignette precisely. Wallerian degeneration is a distinct process describing the breakdown of an axon distal to a site of nerve injury, not a synaptic strengthening phenomenon, so it does not match this description. Peripheral nerve remyelination is a distinct reparative process restoring the myelin sheath after injury, unrelated to the activity-dependent synaptic strengthening described in this vignette.

4. A. Nociplastic pain is the taxonomic category specifically describing pain arising from altered nociception despite no clear evidence of actual or threatened tissue damage causing activation of peripheral nociceptors and no evidence of disease or lesion of the somatosensory system, matching this

vignette precisely. Nociceptive pain requires evidence of actual or threatened tissue damage activating nociceptors, which is explicitly absent in this vignette's normal exam and imaging findings. Neuropathic pain requires a demonstrable lesion or disease of the somatosensory nervous system, which is also explicitly absent in this vignette, ruling it out as the correct category.

5. B. A cohort study follows groups defined by an exposure status (here, the occupational exposure) forward over time to compare subsequent outcome incidence, without randomly assigning the exposure itself, which is exactly the design described in this vignette. A randomized controlled trial requires random assignment of the exposure or intervention by the investigators, which is explicitly absent in this vignette since the exposure is observational, not assigned. A case report describes the clinical course of a single patient or small case series, not a comparative study following two defined groups over time as described here.

6. A. A confidence interval represents the range within which the true population effect size is likely to fall, given the observed sample data and the specified confidence level (here, 95%), which is the correct statistical interpretation. A confidence interval does not describe the exact range experienced by every individual patient; it describes uncertainty around the estimated population-level mean effect, not individual patient variability. A confidence interval is not a probability statement about the null hypothesis being true; that type of inference relates to p-values and hypothesis testing, not to the interpretation of a confidence interval itself.

7. C. Shared decision-making is defined by a collaborative process in which risks, benefits, and alternatives are discussed and the patient's preferences and values are explicitly incorporated into the final treatment decision, with documentation of that process, matching this vignette precisely. Universal precautions screening refers to a standardized initial risk-stratification approach applied to all pain patients starting opioid therapy, not a documentation requirement for shared collaborative decision-making. Peer chart review is a distinct quality-assurance practice in which colleagues review documentation for quality or compliance purposes, not the same as the collaborative patient-preference-incorporating process described here.

8. B. Scope-of-practice and physician supervision/delegation requirements for advanced practice providers, including controlled substance prescribing authority, are set at the state level and vary meaningfully between states, which is exactly the consideration illustrated in this vignette. DEA registration is a federal requirement, but the specific scope of independent prescribing authority for an advanced practice provider is governed by state law, not by DEA registration itself, making this option an incomplete and inaccurate characterization. HIPAA governs the privacy and release of protected health information, an entirely separate regulatory domain from the prescribing-authority and supervision question illustrated in this vignette.

9. A. The HIPAA minimum necessary standard requires that only the minimum amount of protected health information needed to accomplish a specific purpose be used or disclosed, which is exactly the principle reflected in limiting billing staff access to only what is needed for that claim. Therapeutic

privilege is a distinct, narrow ethical concept referring to withholding certain information from a patient when disclosure itself would cause significant harm, unrelated to internal staff data-access limitation. Informed consent concerns a patient's right to understand and agree to a proposed treatment or procedure, an entirely different concept from the internal data-minimization policy described in this vignette.

10. B. Beneficence (the obligation to act for the patient's benefit) and non-maleficence (the obligation to avoid causing harm) are the two core principles directly balanced when weighing a procedure's potential benefit against its potential risk of harm, matching this vignette's decision-making process precisely. Autonomy (respecting the patient's right to self-determination) and justice (fair distribution of resources) are genuine core ethical principles, but they are not what is being weighed in this specific risk-versus-benefit clinical judgment, which centers on benefit versus harm rather than patient choice or fairness. Fidelity (keeping commitments) and veracity (truth-telling) are also genuine ethical principles, but they do not describe the benefit-versus-harm weighing process central to this vignette's clinical decision.

11. B. The Brief Pain Inventory specifically assesses pain severity across worst/least/average/current ratings and separately assesses pain interference across multiple functional domains, matching this vignette's description precisely. The Oswestry Disability Index is a distinct instrument focused specifically on low back pain-related functional disability across defined activities, not a general severity-plus-interference tool applicable across pain conditions as described here. The Pain Catastrophizing Scale measures rumination, magnification, and helplessness related to pain, not pain intensity and interference ratings, making it a different type of instrument from the one described in this vignette.

12. A. The Numeric Rating Scale asks patients to select a whole number, typically 0-10, to represent their pain intensity, which is exactly the tool described in this vignette for a cognitively intact, verbal adult. The FLACC scale is a behavioral observation tool designed for young, nonverbal, or preverbal children, not a self-report numeric tool used by a cognitively intact adult as described here. PAINAD is a behavioral observation tool designed for nonverbal patients with advanced dementia, not a self-report numeric scale used by a cognitively intact patient as in this vignette.

13. C. Pressure algometry uses a calibrated handheld device to apply gradually increasing pressure until the patient reports pain onset, quantifying the pressure pain threshold in units such as kilopascals, matching this vignette's description precisely. Electromyography measures the electrical activity of muscle in response to nerve stimulation, an entirely different modality from the mechanical pressure threshold testing described here. Two-point discrimination testing measures a patient's ability to distinguish two nearby simultaneous touch points on the skin, assessing tactile discrimination rather than the pain threshold to gradually increasing pressure described in this vignette.

14. C. The DN4 (Douleur Neuropathique en 4 questions) questionnaire combines specific symptom descriptors (burning, painful cold, electric shocks, tingling, numbness, itching) with a brief bedside sensory exam to help distinguish neuropathic from nociceptive pain, matching this vignette's description

exactly. The Oswestry Disability Index assesses functional disability related to low back pain across specific activities, not neuropathic symptom quality screening, making it an unrelated tool for this purpose. The Pain Catastrophizing Scale measures cognitive-affective responses to pain such as rumination and helplessness, not the symptom-descriptor-based neuropathic screening described in this vignette.

15. B. The STarT Back screening tool is a brief, validated instrument that stratifies patients with low back pain into low, medium, or high risk of poor outcome/chronicity, specifically to guide the intensity of the initial treatment approach, matching this vignette precisely. The Functional Capacity Evaluation is a structured, observed physical performance battery used to determine safe functional work capabilities, not a brief risk-stratification screening tool administered at an initial visit. The McGill Pain Questionnaire characterizes the sensory, affective, and evaluative qualities of a patient's pain experience, not risk stratification for chronicity, making it a different type of instrument from the one described here.

16. A. A single diagnostic block carries a recognized false-positive rate from placebo response and other nonspecific factors, and requiring a second, concordant confirmatory block substantially improves diagnostic accuracy before proceeding to a more definitive procedure like radiofrequency ablation -- exactly the rationale described in this vignette. This practice addresses diagnostic accuracy of the block's pain-relief result, not epidural hematoma risk, which is a distinct anticoagulation/bleeding-related procedural safety concern unrelated to false-positive diagnostic response. Antibiotic prophylaxis is generally not required for routine diagnostic medial branch blocks (a non-implant procedure), and this vignette's focus on confirmatory testing has nothing to do with infection prevention.

17. B. Symptom validity testing, sometimes referred to as effort or malingering assessment, uses standardized methods to detect submaximal effort or inconsistent, exaggerated symptom reporting during an evaluation, matching this vignette's description and purpose exactly. Quantitative sensory testing measures sensory thresholds (such as thermal or vibration detection) using standardized stimuli, which is a different type of assessment from effort/validity testing for exaggerated symptom reporting. Electrodiagnostic testing (EMG/NCS) assesses nerve and muscle electrophysiologic function, an entirely different type of assessment unrelated to detecting inconsistent effort or symptom exaggeration.

18. B. PROMIS (Patient-Reported Outcomes Measurement Information System) Pain Interference is a standardized, computer-adaptive measurement system specifically designed to assess how pain interferes with functioning across multiple domains, allowing cross-condition and cross-population comparison, matching this vignette's description precisely. The Wong-Baker FACES scale is a simple pediatric-friendly intensity scale using facial expressions, not a standardized computer-adaptive interference measurement system as described here. The Glasgow Coma Scale assesses level of consciousness after brain injury, an entirely unrelated clinical measure with no connection to pain interference assessment.

19. C. Ecological momentary assessment involves repeated, real-time sampling of a patient's experience (such as pain intensity) in their natural environment, captured close to the moment it occurs rather than

relying on retrospective recall, matching this vignette's smartphone-based, multiple-times-daily methodology exactly. A retrospective chart review involves examining existing medical records after the fact, not real-time, prospective, repeated patient-reported sampling as described here. A cross-sectional survey administered once captures a single snapshot in time, which is the opposite of the repeated, longitudinal, real-time sampling methodology described in this vignette.

20. A. The Central Sensitization Inventory is a validated 25-item self-report questionnaire specifically designed to capture symptoms associated with central sensitization, such as fatigue, sensory sensitivity, and widespread pain, matching this vignette's description exactly. The Beck Depression Inventory measures depressive symptom severity, not central sensitization-related somatic and sensory symptoms, making it a different type of instrument from the one described here. The Timed Up and Go test is a brief mobility and fall-risk assessment involving a timed physical task, entirely unrelated to the self-report central sensitization symptom questionnaire described in this vignette.

21. B. Tapentadol combines mu-opioid receptor agonism with inhibition of norepinephrine reuptake, and this dual mechanism allows it to enhance descending inhibitory pain pathways in addition to direct opioid analgesia, which is its defining pharmacologic feature. Tapentadol has no COX-2 inhibitory activity; that mechanism describes NSAIDs, an entirely separate drug class, not an opioid analgesic like tapentadol. Tapentadol's clinically relevant opioid activity is at the mu receptor, not the kappa receptor, and its added monoamine mechanism is norepinephrine reuptake inhibition rather than serotonin reuptake inhibition, distinguishing its profile from mixed serotonergic-opioid agents like tramadol.

22. A. Codeine is a prodrug that CYP2D6 converts to morphine, its active analgesic metabolite; in ultra-rapid metabolizers, this conversion happens much faster and produces disproportionately high morphine levels, which can be transferred to a breastfeeding infant and cause opioid toxicity -- the correct and clinically important mechanism described in this vignette. Ultra-rapid metabolizer status increases, rather than prevents, conversion of codeine to its active morphine metabolite, making this option the opposite of the actual pharmacogenomic effect. Codeine's clinically important analgesic activity depends on hepatic CYP2D6 bioactivation to morphine, not renal elimination of unchanged drug, so CYP2D6 status is highly relevant to codeine's effect, not irrelevant as this option claims.

23. C. Meperidine is metabolized to normeperidine, a renally cleared, proconvulsant active metabolite that accumulates with repeated dosing (especially in renal impairment), producing tremors, myoclonus, and seizures -- a toxicity unique to meperidine among commonly used opioids and the reason its repeated or prolonged use is now generally avoided. Meperidine's seizure risk is due to normeperidine accumulation with repeated dosing, not direct GABA-A receptor blockade at any single dose, so this option misattributes the mechanism. Meperidine neurotoxicity is not mediated through hypoglycemia; the mechanism is metabolite accumulation and CNS excitotoxicity, not a glucose-related effect.

24. B. Methylnaltrexone is a peripherally acting mu-opioid receptor antagonist that is designed not to readily cross the blood-brain barrier, allowing it to block the peripheral gut mu receptors responsible for opioid-induced constipation while sparing central mu-receptor-mediated analgesia -- exactly the

selective mechanism described in this vignette. If methylnaltrexone freely crossed the blood-brain barrier as a full central antagonist, it would reverse analgesia along with constipation, which directly contradicts the selective effect described in this vignette and is the opposite of how PAMORAs are designed to work. Methylnaltrexone's mechanism is opioid receptor antagonism in the gut, not a direct, opioid-receptor-independent stimulant effect on colonic smooth muscle.

25. C. Chronic opioid use can suppress hypothalamic-pituitary-gonadal axis signaling, reducing gonadotropin release and leading to opioid-induced androgen deficiency with symptoms such as fatigue, decreased libido, and low serum testosterone -- exactly the complication described in this vignette. Opioids are not recognized to cause hyperthyroidism; this endocrine effect does not match the described suppression pattern or the low testosterone finding in this vignette. While chronic opioids can also suppress the hypothalamic-pituitary-adrenal axis to some degree, the specific presentation described here (low testosterone, decreased libido) is the classic androgen deficiency pattern, not primary adrenal gland destruction, which is a distinct and much more severe process.

26. B. Naltrexone is a long-acting mu-opioid receptor antagonist, available in oral daily or extended-release injectable monthly formulations, used after detoxification to block the euphoric and reinforcing effects of any subsequent opioid use in support of relapse prevention -- exactly the role described in this vignette. Naltrexone is not primarily used for acute intoxication reversal in the emergency department; that acute reversal role belongs to naloxone, a distinct, short-acting agent, which the vignette explicitly contrasts naltrexone against. Naltrexone is an antagonist, not an agonist, and blocking (rather than activating) the mu receptor is precisely the mechanism that supports relapse prevention, making a full-agonist description incorrect.

27. C. Abuse-deterrent formulation technology is specifically designed to physically or chemically resist manipulation (such as crushing, dissolving, or extraction) that would otherwise allow rapid-release misuse or non-oral routes of administration, matching the gel-forming tamper-resistant mechanism described in this vignette. This describes a specifically engineered extended-release product with built-in tamper resistance, which is the opposite of a standard immediate-release formulation lacking any such features. This is not a pediatric-specific liquid compounding strategy; the vignette specifically describes solid tablet tamper-resistance technology aimed at deterring misuse, not a pediatric dosing accuracy formulation.

28. C. Morphine and certain other opioids can directly trigger non-immune-mediated histamine release from mast cells, producing pruritus without hives, rash, or other features of a true allergic reaction -- a common and generally benign phenomenon distinct from true opioid allergy. This presentation, without rash, hives, or other systemic allergic features, is not consistent with a true IgE-mediated allergic reaction, which is a distinct and much less common mechanism requiring a different clinical response. There is no indication in this vignette of hepatotoxicity or cholestasis (such as jaundice or elevated liver enzymes), making cholestatic pruritus an inaccurate and unsupported explanation for this isolated itching symptom.

29. A. NSAIDs inhibit renal prostaglandin synthesis, which reduces renal blood flow and lithium clearance, allowing serum lithium concentrations to rise even without any change in the prescribed lithium dose -- a well-documented and clinically important interaction matching this vignette. Lithium is not significantly hepatically metabolized to a toxic metabolite; it is renally eliminated largely unchanged, so a hepatic metabolism-based interaction mechanism is inaccurate for this drug. This is a well-documented, clinically significant pharmacokinetic interaction between NSAIDs and lithium mediated through renal clearance, so dismissing it as coincidental ignores a genuine, well-established drug interaction risk.

30. A. NSAIDs impair platelet aggregation via COX-1 inhibition and can independently cause gastric mucosal injury, both of which compound bleeding risk when combined with warfarin's separate anticoagulant mechanism, which is the correct explanation for this vignette's increased bleeding risk. NSAIDs do not inhibit hepatic synthesis of vitamin K-dependent clotting factors; that is specifically warfarin's own mechanism, not a shared or mimicked NSAID effect. Despite acting through different primary pathways, NSAIDs and warfarin have a well-recognized additive bleeding risk when combined, so claiming there is no additive risk is factually incorrect and clinically important to recognize.

31. C. NSAIDs exist along a spectrum of COX-1/COX-2 selectivity, and meloxicam's intermediate relative COX-2 selectivity at typical doses reflects a partial GI-sparing benefit compared to fully nonselective agents, while still carrying more residual COX-1-related GI/platelet risk than a highly selective agent like celecoxib -- the correct concept illustrated by this vignette. COX selectivity relates to the balance of GI and platelet effects, not to onset of action speed, so describing this gradient as primarily affecting onset of action misattributes what selectivity actually governs. Meloxicam is available in standard oral formulations, not exclusively parenteral administration, making this option factually incorrect.

32. A. Because acetaminophen is present in many different OTC and prescription combination products, patients must track their TOTAL cumulative daily dose across all sources to stay within the recommended maximum and avoid unintentional hepatotoxic overdose -- the key, clinically important safety principle in this vignette. Acetaminophen does have a well-established recommended maximum daily dose specifically because of its hepatotoxicity risk at supratherapeutic cumulative exposure, so claiming it has no defined maximum is incorrect and dangerous. All acetaminophen-containing products, whether OTC or prescription, contribute to the same cumulative hepatotoxicity risk and must be counted together, so exempting OTC products from the total is a significant and unsafe miscounting error.

33. A. Naproxen retains relatively more substantial and longer-lasting COX-1-mediated antiplatelet activity compared to more COX-2-selective agents, and this residual antiplatelet effect is thought to partially offset the prothrombotic cardiovascular risk associated with reduced COX-2-derived prostacyclin, which is the proposed explanation for naproxen's relatively more favorable cardiovascular risk profile among NSAIDs. Naproxen does inhibit COX-1 meaningfully (this is precisely the basis for the proposed explanation), so claiming it has no COX-1 activity at all directly contradicts the actual

mechanism being described. NSAIDs, including naproxen, do not have a favorable blood-pressure-lowering effect; if anything, NSAIDs as a class tend to modestly raise blood pressure, making this an inaccurate explanation for naproxen's relative cardiovascular profile.

34. C. The combination of an ACE inhibitor (or ARB), a diuretic, and an NSAID is specifically termed the "triple whammy," reflecting the synergistic reduction in renal perfusion from each drug's distinct mechanism, which together substantially increase acute kidney injury risk -- exactly the scenario and terminology described in this vignette. Serotonin syndrome is an entirely unrelated toxidrome caused by excess serotonergic activity, not a renal perfusion-related drug interaction involving ACE inhibitors, diuretics, and NSAIDs. Milk-alkali syndrome is a distinct condition caused by excessive calcium and absorbable alkali intake, unrelated to the ACE inhibitor/diuretic/NSAID renal interaction described in this vignette.

35. B. Tinnitus is a classic early warning sign of salicylate toxicity, and its appearance along with hearing changes and hyperventilation (from salicylate-induced respiratory center stimulation) in a patient on high-dose aspirin should prompt evaluation for early salicylate toxicity before more severe effects develop. Tinnitus is not an expected, benign finding at routine therapeutic aspirin doses; its appearance signals that the dose is approaching or exceeding the toxic threshold, which is the entire clinical significance being tested in this vignette. While an unrelated ear infection is possible in general, the combination of tinnitus with hyperventilation in the specific context of high-dose aspirin therapy is classically and specifically explained by salicylate toxicity, making an unrelated infection a far less parsimonious explanation.

36. C. Venlafaxine exhibits dose-dependent pharmacology: at lower doses it acts predominantly as a serotonin reuptake inhibitor, while clinically meaningful norepinephrine reuptake inhibition typically emerges only at higher doses, which is the correct and clinically relevant mechanism described in this vignette. Venlafaxine's serotonergic activity is actually present and predominant at lower doses, not absent, making the claim that it is purely noradrenergic at all doses incorrect. Venlafaxine's activity is explicitly dose-dependent (this dose-dependence is the entire point of the vignette), so describing its mechanism as dose-independent directly contradicts the phenomenon being tested.

37. B. Oxcarbazepine, a keto-analog of carbamazepine, generally has fewer drug interactions due to less potent hepatic enzyme induction, but it still carries a meaningful, sometimes even higher, risk of hyponatremia and requires ongoing sodium monitoring, which is the correct and clinically important consideration for this switch. Oxcarbazepine's hyponatremia risk is a genuine concern that must still be monitored (it is not simply identical and unimproved, since the switch is often made partly for the interaction profile advantage, though hyponatremia risk persists), making the "no advantage" framing an oversimplification of the real, more nuanced consideration. HLA-B*1502 screening recommendations are specifically tied to carbamazepine (and related concerns with oxcarbazepine in certain populations), but describing it as required in "all patients regardless of ancestry" overstates and misrepresents the population-specific nature of this pharmacogenomic screening recommendation.

38. B. Topiramate's migraine-preventive effect is attributed to multiple proposed mechanisms, including enhanced GABAergic inhibition, voltage-gated sodium channel blockade, and glutamate receptor modulation, which together are thought to reduce cortical excitability relevant to migraine pathophysiology -- the correct, multi-mechanism explanation. Topiramate is not a TRPV1 receptor antagonist; that receptor and its modulation are unrelated to topiramate's actual anticonvulsant-derived migraine-preventive mechanisms. Topiramate has no opioid receptor activity; it is an anticonvulsant with a distinct, non-opioid mechanism entirely unrelated to mu-receptor agonism.

39. A. Valproate carries a well-documented, significant teratogenic risk, including neural tube defects, and its use in women of childbearing potential requires careful reproductive counseling and discussion of effective contraception, which is the correct and clinically essential safety consideration for this vignette. Valproate's teratogenic risk is one of the most well-established and clinically significant concerns among anticonvulsants, so claiming there are no reproductive or fetal safety concerns is dangerously incorrect. The teratogenicity concern is specifically relevant to women of REPRODUCTIVE age (due to fetal exposure risk during pregnancy), not postmenopausal women, making this option's population targeting backward and incorrect.

40. A. Milnacipran is an SNRI notable for being FDA-approved specifically for fibromyalgia in the United States, without carrying an FDA-approved depression indication domestically, which distinguishes its regulatory history from most other SNRIs and is the correct, specific fact being tested. Milnacipran is an SNRI, not a tricyclic antidepressant, and its fibromyalgia indication is specifically FDA-approved rather than merely off-label use, making this option factually incorrect on both counts. Milnacipran is chemically and mechanistically an SNRI antidepressant-class drug, not a gabapentinoid; its FDA approval pathway and mechanism are distinct from pregabalin's, making this option inaccurate.

41. C. Nortriptyline is the active metabolite of amitriptyline and is generally better tolerated, with relatively less pronounced anticholinergic and sedative side effects, while still retaining meaningful analgesic activity for neuropathic pain -- making it a rational switch within the same drug class for a patient bothered by amitriptyline's side effects. Nortriptyline does retain meaningful analgesic activity for neuropathic pain (this is precisely why it remains a reasonable within-class substitute rather than an abandonment of TCA therapy), so claiming it has no analgesic activity is incorrect. Nortriptyline and amitriptyline do NOT have identical side-effect profiles; nortriptyline is specifically known for a relatively more favorable (though not side-effect-free) tolerability profile, which is exactly the clinical rationale for this switch.

42. C. Duloxetine carries a labeled warning against use in patients with hepatic insufficiency or substantial alcohol use, based on case reports of hepatotoxicity, making significant liver disease an important contraindication-level consideration before prescribing it in this vignette. Duloxetine does undergo significant hepatic metabolism, and this hepatic handling is precisely why hepatic impairment is a specific labeled concern, so claiming it requires no special consideration in liver disease is incorrect. Duloxetine is not renally eliminated in a way that would make it a preferred first-line option in severe

hepatic impairment; in fact, hepatic impairment is a specific caution/contraindication for this drug, the opposite of what this option claims.

43. A. Gabapentin enacarbil is a prodrug specifically designed for more consistent, sustained absorption via an active transport mechanism, enabling once- or twice-daily oral dosing, which improves adherence compared to standard immediate-release gabapentin's typical three-times-daily regimen -- exactly the advantage described in this vignette. Gabapentin enacarbil is converted to gabapentin itself after absorption and retains the same alpha-2-delta calcium channel mechanism as gabapentin, not an entirely different NMDA receptor-based mechanism, making this option factually incorrect. Gabapentin enacarbil is an oral formulation requiring gastrointestinal absorption (via its specific active transport mechanism), not an injectable product requiring no absorption at all.

44. B. Tizanidine is a central alpha-2 adrenergic agonist that reduces the release of excitatory neurotransmitters from spinal interneurons, decreasing muscle tone and spasticity through a central mechanism, which is the correct explanation for this vignette. Tizanidine does not act directly at the neuromuscular junction on nicotinic receptors; that mechanism describes neuromuscular blocking agents used in anesthesia, an entirely different drug class and mechanism. Tizanidine's mechanism is central (spinal alpha-2 agonism), not a peripheral ryanodine receptor blockade, which is instead the mechanism of dantrolene, a different and pharmacologically distinct antispasticity agent.

45. B. Baclofen is a GABA-B receptor agonist that acts in the spinal cord to inhibit excitatory neurotransmitter release and dampen reflex muscle activity, which is the correct and well-established mechanism underlying its antispasticity effect. Baclofen does not work through direct peripheral motor nerve sodium channel blockade; its mechanism is central, at spinal GABA-B receptors, not a peripheral nerve conduction-blocking effect. Baclofen has no acetylcholinesterase inhibitory activity; that mechanism describes a different pharmacologic class entirely (relevant to conditions like myasthenia gravis), not baclofen's actual GABA-B-mediated spasticity mechanism.

46. C. At carefully monitored, subanesthetic plasma concentrations, systemic IV lidocaine's sodium channel blockade is thought to reduce ectopic neuronal firing and dampen central hyperexcitability contributing to central neuropathic pain, without producing sedation or anesthesia -- the correct mechanism for this therapeutic use. Lidocaine is not a TRPV1 receptor agonist; that mechanism describes capsaicin, an entirely different analgesic agent and mechanism. This use of IV lidocaine is specifically dosed at subanesthetic levels to preserve consciousness while achieving analgesia, so attributing its effect to general anesthesia-level sedation directly contradicts how this therapy is actually administered and monitored.

47. C. Magnesium acts as a physiological antagonist at the NMDA receptor-associated calcium channel, and this NMDA-blocking effect is proposed to reduce central sensitization and wind-up, providing adjuvant analgesic benefit, particularly for pain states involving central sensitization. Magnesium has no direct mu-opioid receptor agonist activity; its proposed analgesic mechanism is through NMDA receptor modulation, an entirely different receptor system from the opioid receptors. Magnesium does not inhibit

cyclooxygenase enzymes; that mechanism describes NSAIDs, a pharmacologically distinct drug class from magnesium's proposed NMDA-based mechanism.

48. A. Dextromethorphan, in addition to its common antitussive use, has NMDA glutamate receptor antagonist activity at higher doses, conceptually similar in receptor target (though a distinct specific agent and clinical context) to ketamine's NMDA-blocking mechanism, which is the correct receptor mechanism described in this vignette. Dextromethorphan is not primarily known for 5-HT₃ serotonin receptor antagonism; that mechanism describes antiemetics such as ondansetron, an unrelated drug class and mechanism. Dextromethorphan has no meaningful direct agonist activity at cannabinoid CB₁ receptors; its relevant analgesic-adjacent mechanism of interest is specifically NMDA receptor antagonism, not the cannabinoid receptor system.

49. B. Methocarbamol is a centrally acting muscle relaxant whose precise mechanism of action for muscle relaxation has not been fully established, though it is generally believed to work through general central nervous system depressant effects rather than a specific, well-defined receptor mechanism, which accurately characterizes the current understanding of this drug. Unlike baclofen, methocarbamol's mechanism is not attributed to a specific, well-defined GABA-B receptor agonist action; describing it as identical to baclofen's precise mechanism misrepresents the comparatively less well-characterized pharmacology of methocarbamol. Methocarbamol is centrally acting, not a peripheral neuromuscular blocking agent acting directly at the motor endplate, which is a mechanism more characteristic of agents used in surgical anesthesia, not oral muscle relaxants like methocarbamol.

50. C. Nabilone is a synthetic cannabinoid that acts as an agonist at both CB₁ (predominantly central) and CB₂ (predominantly peripheral/immune) cannabinoid receptors, providing antiemetic and adjunctive analgesic effects through the same receptor system targeted by naturally occurring cannabinoids, which is the correct classification and mechanism. Nabilone is a synthetic, laboratory-produced compound, not an unmodified plant-derived cannabis extract, and it engages both CB₁ and CB₂ receptors rather than acting exclusively on peripheral CB₂ receptors. Nabilone is not a benzodiazepine and has no relationship to that drug class or its GABA-A receptor mechanism; its antiemetic and analgesic effects are specifically cannabinoid-receptor mediated.

51. A. The interscalene brachial plexus block targets the brachial plexus roots/trunks between the anterior and middle scalene muscles, providing excellent anesthesia and analgesia for shoulder and proximal upper arm surgery, matching this vignette's anatomic target and clinical use precisely. The adductor canal block targets the saphenous nerve and other structures in the thigh's adductor canal for knee-related analgesia, an entirely different anatomic region from the shoulder described in this vignette. An ilioinguinal nerve block targets a distinct nerve supplying the groin/inguinal region, unrelated to shoulder or brachial plexus anesthesia.

52. A. The adductor canal block targets primarily sensory branches (including the saphenous nerve) within the adductor canal, providing effective knee analgesia while largely sparing quadriceps motor strength, unlike a femoral nerve block which affects the motor-rich femoral nerve trunk -- exactly the

rationale and target described in this vignette. The interscalene brachial plexus block targets the shoulder region's brachial plexus, an entirely different anatomic location from the knee described in this vignette. A stellate ganglion block targets cervical sympathetic innervation to the upper extremity, unrelated to knee analgesia or the adductor canal anatomy described here.

53. B. The serratus anterior plane block delivers local anesthetic into the fascial plane superficial to the serratus anterior muscle along the mid-axillary line, providing effective anterolateral chest wall analgesia and serving as an alternative regional technique for rib fracture pain, matching this vignette precisely. The quadratus lumborum block targets the abdominal wall and flank region via a different fascial plane in the posterior abdomen, not the anterolateral chest wall described in this vignette. The adductor canal block targets the thigh for knee-related analgesia, an entirely different anatomic region from the chest wall described here.

54. B. The quadratus lumborum block delivers local anesthetic into the fascial plane around the quadratus lumborum muscle, providing abdominal wall analgesia that is often longer-lasting than more superficial abdominal blocks due to spread toward the thoracolumbar paravertebral space, matching this vignette precisely. The serratus anterior plane block targets the anterolateral chest wall via a different fascial plane, not the abdominal wall described in this vignette. The interscalene brachial plexus block targets the shoulder region, an entirely different anatomic location unrelated to abdominal wall analgesia.

55. C. A thoracic paravertebral block delivers local anesthetic into the paravertebral space adjacent to the exiting spinal nerve, producing unilateral segmental somatic and sympathetic blockade comparable in coverage to a thoracic epidural but limited to one side, matching this vignette's description precisely. A stellate ganglion block targets cervical sympathetic innervation to the upper extremity and head/neck, an anatomically distinct target from the thoracic paravertebral space described in this vignette. A celiac plexus block targets abdominal visceral sympathetic innervation, an entirely different anatomic region and purpose from the unilateral segmental thoracic block described here.

56. C. The suprascapular nerve block targets the suprascapular nerve at the suprascapular notch, providing significant sensory analgesia to the shoulder joint and is commonly used for conditions such as adhesive capsulitis, matching this vignette's target and clinical indication precisely. An axillary nerve block at the quadrangular space targets a different, more distal nerve with a more limited sensory distribution over the deltoid region, not the broad shoulder joint sensory coverage described in this vignette. An interscalene brachial plexus block targets the plexus proximally and provides broader upper extremity coverage with more associated motor block, which is a different, more extensive intervention than the targeted suprascapular nerve block described here.

57. A. The ilioinguinal and iliohypogastric nerves are commonly implicated in chronic postsurgical groin pain after inguinal hernia repair due to their course through the surgical field, and blocking them near the anterior superior iliac spine is the standard diagnostic and therapeutic approach, matching this vignette precisely. The obturator and femoral nerves supply the medial thigh and anterior

thigh/quadriceps respectively, a different anatomic distribution from the groin/inguinal scar pain described in this vignette. The pudendal and posterior femoral cutaneous nerves supply the perineum and posterior thigh, an anatomically distinct region from the anterior groin pain following inguinal hernia repair described here.

58. B. The sphenopalatine ganglion, an autonomic ganglion located behind the middle turbinate, can be anesthetized via a transnasal approach to provide rapid headache and facial pain relief, including for acute migraine, matching this vignette's description and technique exactly. The stellate ganglion is a cervical sympathetic structure targeted via a separate anterior neck approach for upper extremity sympathetic pain, not accessible or relevant via the intranasal technique described in this vignette. The Gasserian (trigeminal) ganglion is an intracranial structure at the skull base typically accessed via a percutaneous approach through the cheek for trigeminal neuralgia procedures, not through the intranasal sphenopalatine approach described here.

59. A. Percutaneous procedures for refractory trigeminal neuralgia, such as radiofrequency thermocoagulation or balloon compression, target the Gasserian (trigeminal) ganglion at the skull base via a needle passed through the cheek and foramen ovale, matching this vignette's approach and target precisely. The sphenopalatine ganglion is accessed via a transnasal, not a transcutaneous cheek/foramen ovale, approach and is a distinct structure used for headache/facial pain of a different origin. The stellate ganglion is a cervical sympathetic structure accessed via an anterior neck approach, an entirely different anatomic location and access route from the skull-base trigeminal ganglion described in this vignette.

60. A. Percutaneous discectomy involves removing a portion of nucleus pulposus material through a small percutaneous cannula to decompress a contained disc herniation and reduce nerve root irritation, without open surgical exposure, matching this vignette's description precisely. Kyphoplasty is a distinct procedure for treating vertebral compression fractures by restoring vertebral body height with a balloon before cement injection, not a disc decompression procedure for herniation. Facet joint radiofrequency ablation targets the medial branch nerves supplying the facet joints for facet-mediated pain, an entirely different target and indication from disc herniation decompression.

61. B. Cement leakage (extravasation) is a recognized complication of vertebral augmentation in which injected cement escapes the vertebral body, and its clinical significance ranges from asymptomatic (most common) to causing neural compression requiring further intervention, depending on the leakage location and volume -- the correct and clinically nuanced description. This complication is a mechanical cement extravasation issue, not an infectious epidural abscess, so requiring emergent surgical decompression "in all cases" mischaracterizes both the mechanism and the typically variable severity of this complication. A dural puncture headache is an entirely different complication related to inadvertent dural puncture during a needle-based spinal procedure, not related to cement extravasation from vertebral augmentation.

62. A. Percutaneous epidural lysis of adhesions, often referred to as the Racz procedure, uses a catheter advanced into the epidural space to mechanically and pharmacologically break up scar tissue restricting

nerve root mobility, matching this vignette's description and indication (post-surgical epidural scarring) precisely. Sacral neuromodulation is an entirely different implanted neurostimulation therapy targeting sacral nerve roots for pelvic/bladder dysfunction, not a scar-lysis procedure for radicular pain. Vertebral augmentation addresses vertebral compression fractures through cement injection, an unrelated procedure and indication from the epidural adhesion lysis described in this vignette.

63. B. Sacral neuromodulation specifically targets the sacral nerve roots (commonly S3) that control bladder and pelvic floor function, and it is a distinct implanted therapy from spinal cord stimulation, used for conditions like refractory bladder pain syndrome and pelvic pain, matching this vignette precisely. Dorsal root ganglion stimulation of the lumbar spine targets a different level and structure, typically used for focal lower extremity neuropathic pain rather than bladder/pelvic floor dysfunction specifically. Occipital nerve peripheral stimulation targets an entirely different anatomic region (the head/scalp for headache disorders), unrelated to bladder or pelvic pain.

64. C. High-frequency (10 kHz) and burst stimulation waveforms use distinct stimulation parameters that can achieve meaningful pain relief without producing the paresthesia (tingling) sensation that patients typically feel with conventional tonic spinal cord stimulation, which is the key distinguishing feature described in this vignette. These newer waveforms are still electrical spinal cord stimulation therapies delivered through the same type of implanted epidural leads, not a fundamentally different drug-delivery mechanism, making this option factually incorrect. These newer waveform options are not restricted only to patients who have already failed conventional tonic SCS; they can be considered as primary options depending on device availability and clinical judgment, not a mandatory sequential requirement.

65. A. Closed-loop spinal cord stimulation uses evoked compound action potential (ECAP) sensing to measure the actual neural response to each stimulation pulse and automatically adjust amplitude in real time, maintaining more consistent activation despite position changes, matching this vignette's description of the technology precisely. Standard open-loop tonic stimulation delivers a fixed, unchanging amplitude without real-time feedback sensing, which is the opposite of the automatically adjusting, sensor-based system described in this vignette. Intrathecal drug delivery is an entirely different modality involving medication infusion rather than electrical stimulation, and it does not involve ECAP sensing or amplitude auto-adjustment as described here.

66. C. Occipital nerve stimulation involves a subcutaneously placed lead over the occipital region targeting the greater and lesser occipital nerves, used for refractory chronic migraine and other headache disorders, matching this vignette's description and indication precisely. Dorsal root ganglion stimulation targets a spinal structure typically for focal limb neuropathic pain, an anatomically and clinically different application from the occipital headache indication described in this vignette. Sacral neuromodulation targets sacral nerve roots for bladder/pelvic dysfunction, an entirely unrelated anatomic target and indication from the headache-focused occipital nerve stimulation described here.

67. C. Intrathecal baclofen pumps deliver baclofen directly to the intrathecal space, acting on spinal GABA-B receptors to reduce severe spasticity (such as from cerebral palsy) at doses far lower than oral dosing would require, which is the standard and correct therapy for this specific indication described in this vignette. Intrathecal morphine is used for severe pain (particularly cancer-related pain) rather than as the primary intrathecal therapy for spasticity management, making it a less specific match for this vignette's spasticity-focused indication. Intrathecal ziconotide is used for severe chronic pain refractory to other therapies via NMDA-independent calcium channel blockade, not as a first-line spasticity treatment, making it an inconsistent choice for this vignette's cerebral palsy spasticity indication.

68. B. Botulinum toxin injected into the piriformis muscle produces localized chemodenervation, relaxing the muscle and reducing its compressive irritation of the adjacent sciatic nerve, which is the correct therapeutic goal for this refractory piriformis syndrome presentation. The injection targets the piriformis MUSCLE to relieve nerve compression indirectly, not a direct neurolytic destruction of the sciatic nerve itself, which would cause unwanted permanent nerve damage rather than the intended muscle-relaxation effect. Botulinum toxin's clinically relevant effect in this application is local, at the injected muscle, not a systemic antispasmodic effect via bloodstream distribution throughout the body.

69. C. Prolotherapy involves injecting an irritant solution, classically hypertonic dextrose, into lax or injured ligamentous/periarticular tissue to stimulate a local proliferative healing response over time, rather than providing immediate anesthetic or anti-inflammatory relief, matching this vignette's description and stated goal precisely. Corticosteroid injection works through an anti-inflammatory mechanism providing more immediate symptomatic relief, which is explicitly different from the proliferative healing goal described in this vignette. Radiofrequency ablation works through thermal nerve lesioning to interrupt pain signaling, an entirely different mechanism from the tissue-proliferation goal of the dextrose injection described here.

70. B. Viscosupplementation involves injecting hyaluronic acid into the joint to supplement the natural viscoelastic properties of synovial fluid, aiming to improve joint lubrication and reduce osteoarthritis pain, matching this vignette's description and stated goal precisely. Intra-articular corticosteroid injection works through an anti-inflammatory mechanism, which the vignette explicitly distinguishes this treatment from, making it an inconsistent choice for the lubrication-focused therapy described. Platelet-rich plasma injection works through a regenerative growth-factor mechanism aimed at tissue repair, a different mechanism and rationale from the lubrication-supplementation goal of hyaluronic acid described in this vignette.

71. A. Percutaneous tenotomy uses ultrasound guidance and a small needle to mechanically disrupt and debride chronically degenerated tendon tissue without an open surgical incision, which is the appropriate minimally invasive procedure for refractory lateral epicondylitis described in this vignette. Radiofrequency ablation of the medial branch nerve targets spinal facet joint innervation for back or neck pain, an entirely different target and indication from the tendon-directed procedure described here. Vertebral augmentation addresses vertebral compression fractures through cement injection, an unrelated procedure to the tendon debridement described in this vignette.

72. A. Cooled radiofrequency ablation circulates water through the electrode to dissipate heat at the needle tip, allowing a larger, more spherical thermal lesion to form in the surrounding tissue at lower peak temperatures than standard RFA, which is the correct description of this specific technology. Cryoablation uses a different mechanism entirely, freezing tissue with a compressed-gas probe rather than using cooled water to modulate a radiofrequency thermal lesion, making it a distinct technology from what is described in this vignette. Pulsed radiofrequency is a non-thermal (or minimally thermal) technique using intermittent current bursts rather than continuous heating, which is a different mechanism from the cooled continuous thermal lesion technology described here.

73. C. Pulsed radiofrequency delivers current in short bursts with intervening pauses that allow heat to dissipate, avoiding the sustained tissue temperature elevation needed for destructive thermal lesioning, and is thought to modulate nerve function through a non-ablative mechanism, matching this vignette's description precisely. Continuous thermal radiofrequency ablation is the standard destructive technique that pulsed RFA is specifically designed to avoid, making it the opposite of the non-destructive technique described in this vignette. Chemical neurolysis with phenol works through direct chemical protein denaturation of nerve tissue, an entirely different mechanism from the electrical, non-ablative pulsed current technique described here.

74. B. Peripheral field stimulation involves placing a subcutaneous electrode array directly beneath a painful skin region itself, without targeting a specific named nerve or the spinal cord, which distinguishes it from both peripheral nerve stimulation of a specific nerve and spinal cord stimulation, matching this vignette's description exactly. Dorsal root ganglion stimulation targets a specific spinal structure (the DRG) corresponding to a dermatome, not a subcutaneous field directly beneath the painful skin area as described in this vignette. Spinal cord stimulation targets the dorsal columns within the spinal canal via an epidural lead, an anatomically distinct target from the subcutaneous field placement described here.

75. C. An epidural blood patch, in which a small volume of the patient's own blood is injected into the epidural space near the site of dural puncture, is the definitive procedural treatment for a post-dural puncture headache refractory to conservative measures, sealing the leak and relieving the positional headache. Repeating an epidural steroid injection does not address the underlying dural leak causing the headache and is not the appropriate definitive treatment for this specific complication. An intrathecal opioid pump trial is an entirely unrelated therapy for chronic pain management, with no role in treating a post-dural puncture headache.

76. A. A procedural time-out is a structured, team-based verbal verification of patient identity, procedure, site/side, and relevant safety information performed immediately before starting a procedure, which is exactly the practice described in this vignette and is a core patient-safety standard for invasive procedures. Root cause analysis is a distinct quality-improvement process performed retrospectively after an adverse event has already occurred, not a pre-procedure verification step like the one described here. A time-out is a distinct safety verification step from informed consent (which is a separate

discussion of risks/benefits/alternatives obtained earlier), and it does not replace the need for consent, making this option's framing incorrect.

77. B. Sacroiliac joint lateral branch radiofrequency ablation specifically targets the lateral branches of the sacral dorsal rami that innervate the posterior SI joint, providing an analogous denervation approach to lumbar medial branch RFA but directed at the SI joint's distinct sensory innervation, matching this vignette precisely. Lumbar facet medial branch radiofrequency ablation targets the medial branches supplying the lumbar facet joints, an anatomically distinct target from the sacral lateral branches supplying the SI joint described in this vignette. Celiac plexus neurolysis targets abdominal visceral sympathetic innervation for conditions like pancreatic cancer pain, an entirely unrelated anatomic target and indication from the SI joint procedure described here.

78. C. Monitored anesthesia care with moderate procedural sedation involves a dedicated anesthesia provider titrating sedative medication to keep the patient comfortable while preserving spontaneous respiration and responsiveness to verbal cues, which is exactly the level of sedation and monitoring described in this vignette. General anesthesia with a secured airway involves a much deeper level of unconsciousness with airway management (such as an endotracheal tube), which is distinctly different from the responsive, spontaneously breathing state described in this vignette. The vignette explicitly describes administration of IV sedative medication, which directly contradicts a description of no sedation with local anesthetic alone.

79. A. The basivertebral nerve is a specific nerve within the vertebral body that is thought to transmit nociceptive signals from damaged, Modic-change-positive vertebral endplates, and its ablation is the specific target of this newer procedure for vertebrogenic low back pain, matching this vignette precisely. The greater occipital nerve is located in the posterior scalp and has no relationship to vertebral body or endplate pain, making it an anatomically unrelated target. The pudendal nerve supplies perineal sensation and has no relationship to vertebral endplate or vertebrogenic back pain, making it an entirely unrelated anatomic target for this vignette.

80. B. Percutaneous facet synovial cyst aspiration, sometimes with intentional rupture of the cyst wall, is a minimally invasive image-guided technique used to decompress a nerve root compressed by a facet-origin synovial cyst, offering a potential alternative to open surgical excision, matching this vignette's description precisely. Vertebral augmentation addresses vertebral compression fractures through cement injection, an entirely different target and indication from the facet synovial cyst described in this vignette. Celiac plexus neurolysis targets abdominal visceral sympathetic innervation, an entirely unrelated anatomic target and indication from the lumbar facet cyst procedure described here.

81. B. Graded exposure therapy systematically and repeatedly exposes a patient to specific feared movements in a hierarchical fashion, based on principles similar to exposure therapy for phobias, and is specifically designed to reduce kinesiphobia and movement avoidance -- exactly the approach described in this vignette. Passive modality therapy using heat alone is a passive treatment that does not involve the active, graded behavioral confrontation of feared movements central to exposure therapy.

Trigger point injection therapy is a procedural intervention targeting myofascial taut bands, an entirely different treatment modality unrelated to the behavioral exposure approach described in this vignette.

82. C. Dialectical behavior therapy distress tolerance skills specifically teach patients to tolerate intense emotional distress without resorting to harmful behaviors, and this DBT-derived approach, originally developed for borderline personality disorder, has been adapted for chronic pain management, matching this vignette's description precisely. Progressive muscle relaxation is a distinct, narrower physiologic relaxation technique, not the comprehensive distress-tolerance skill set drawn from DBT described in this vignette. Operant conditioning-based pain behavior modification focuses on reinforcement contingencies for pain behaviors, a different theoretical framework from the DBT-based emotional distress tolerance skills described here.

83. B. Motivational interviewing is a patient-centered communication style that explores and resolves ambivalence about behavior change through open-ended questions, reflective listening, and eliciting the patient's own reasons for change while avoiding confrontation, matching this vignette's description precisely. Cognitive restructuring is a distinct CBT technique focused on identifying and challenging distorted thoughts, not the ambivalence-resolving communication style described in this vignette. Systematic desensitization is a distinct behavioral technique involving graded exposure to feared stimuli, not the conversational, ambivalence-focused communication approach described here.

84. B. Cognitive behavioral therapy for insomnia is a structured, multi-session, evidence-based behavioral treatment addressing maladaptive sleep-related thoughts and behaviors, and it is considered first-line therapy for chronic insomnia, including in patients with comorbid chronic pain, matching this vignette's description precisely. Basic sleep hygiene education is a real but more limited, typically single-session component that lacks the structured, multi-session cognitive and behavioral components (such as stimulus control and sleep restriction) that define full CBT-I. Progressive muscle relaxation is a useful adjunct technique but is not by itself the comprehensive, structured multi-component therapy described in this vignette.

85. C. Peer support and group therapy for chronic pain bring together patients facing similar challenges in a facilitated setting to share coping strategies and provide mutual emotional support, which is exactly the treatment component described in this vignette. Individual psychodynamic psychotherapy is a one-on-one treatment modality focused on unconscious conflicts, not the group-based peer support format described in this vignette. Biofeedback training uses real-time physiologic monitoring for individual self-regulation, an entirely different treatment modality from the group-based peer support described here.

86. A. Clinical hypnosis uses a trained clinician to guide a patient into a focused state of relaxed attention and heightened suggestibility, then applies therapeutic suggestions to alter pain perception, which is exactly the treatment modality described in this vignette. Standard CBT does not involve a trance-induction or heightened-suggestibility component; it relies on structured cognitive and behavioral techniques rather than the hypnotic state described here. TENS is an electrical stimulation device

delivering current through skin electrodes, an entirely different, non-psychological treatment modality from the hypnotic technique described in this vignette.

87. C. The McKenzie method, also known as mechanical diagnosis and therapy, specifically evaluates a patient's directional preference through repeated movement testing to identify a direction that centralizes symptoms, then prescribes exercise emphasizing that specific direction, matching this vignette's description precisely. Generic core stabilization exercise does not involve the specific directional preference assessment and individualized directional exercise prescription that defines the McKenzie method described in this vignette. Passive ultrasound therapy is a passive modality applied by a clinician, not an active, directionally individualized exercise approach based on patient movement testing as described here.

88. B. Ergonomic workplace modification involves assessing and adjusting a worker's physical work environment (desk setup, chair, monitor position, task patterns) to reduce mechanical strain contributing to musculoskeletal pain, matching this vignette's description and intervention exactly. This vignette describes environmental/postural modifications, not a medication-based intervention, so pharmacologic intervention does not match the described approach. This vignette describes a workplace environmental modification, not a needle-based interventional procedure, so an interventional nerve block does not match the described approach.

89. A. Vocational rehabilitation counseling specifically assesses transferable skills, provides retraining, and assists with job placement for workers whose disability prevents return to their prior occupation, matching this vignette's described service precisely. A functional capacity evaluation is a structured physical performance assessment measuring safe functional abilities, a distinct evaluative tool rather than the job retraining and placement service described in this vignette. An acute pain service is a hospital-based team optimizing postoperative/acute pain management, an entirely unrelated service to the vocational retraining and placement described here.

90. A. Osteopathic manipulative treatment is a hands-on diagnostic and treatment system, performed by osteopathic physicians, that includes soft tissue techniques, myofascial release, and gentle mobilization, grounded in a philosophy of interconnected body systems, matching this vignette's description precisely. Radiofrequency ablation is an interventional, needle-based procedural technique, an entirely different modality from the hands-on manual therapy system described in this vignette. Intrathecal drug delivery involves an implanted pump infusing medication, an entirely different, device-based treatment modality unrelated to the manual osteopathic approach described here.

91. C. Dry needling specifically targets myofascial trigger points to elicit a local twitch response and release muscle tension, grounded in a Western biomedical/neuromuscular rationale, which is theoretically distinct from traditional acupuncture's meridian-based framework, even though both use thin needles -- the correct distinction described in this vignette. While both techniques use similar needles, they are grounded in different theoretical frameworks and often target different anatomic points (trigger points versus meridian points), so describing them as identical in every respect overstates their

similarity. The vignette explicitly states no medication is injected with dry needling (it is a "dry" needle technique by definition), making the claim that local anesthetic is required with every placement factually incorrect.

92. B. Qigong is a traditional Chinese mind-body practice involving slow, flowing movements coordinated with breath and focused attention, distinct from but related to tai chi, and it has been studied for benefit in conditions like fibromyalgia, matching this vignette's description precisely. Traditional Swedish massage is a passive manual therapy technique performed by a therapist on the patient, not an active mind-body movement practice performed by the patient as described in this vignette. Standard resistance weight training is a distinct active exercise modality focused on muscular strength, not the slow, flowing, breath-coordinated movement practice described here.

93. C. Guided imagery uses structured, vivid mental visualization of a calming scene, engaging multiple senses, to reduce anticipatory anxiety and pain perception before or during a procedure, matching this vignette's description precisely. Cognitive restructuring is a distinct CBT technique focused on identifying and challenging distorted thoughts, not the sensory visualization technique described in this vignette. Operant behavioral reinforcement focuses on shaping behaviors through consequences, an entirely different mechanism from the mental visualization technique described here.

94. A. Music therapy uses structured musical engagement, delivered by a trained therapist, as an adjunct to reduce pain perception and anxiety, matching this vignette's description of the treatment and its clinical context precisely. Standard biofeedback uses physiologic signal monitoring (such as surface EMG) for self-regulation training, an entirely different treatment modality from the musical engagement technique described in this vignette. TENS is an electrical stimulation device, a distinct physical modality unrelated to the musical/auditory intervention described here.

95. C. Assistive device and adaptive equipment prescription involves recommending specialized tools (such as built-up cushioned grips) that reduce mechanical demand and strain during daily activities, matching this vignette's description of the occupational therapist's intervention precisely. This vignette describes physical adaptive equipment, not a medication-based intervention, so pharmacologic adjuvant therapy does not match the described approach. This vignette describes an adaptive equipment recommendation, not a needle-based procedure, so an interventional nerve block does not match the described intervention.

96. A. Cognitive functional therapy is a newer, individualized biopsychosocial approach for chronic low back pain that integrates targeted movement retraining with cognitive-behavioral strategies addressing a specific patient's pain beliefs and unhelpful movement patterns, matching this vignette's description precisely. Standard passive modality therapy using heat and ultrasound alone lacks the individualized cognitive-behavioral and movement-retraining integration that defines cognitive functional therapy as described in this vignette. An isolated corticosteroid injection is a procedural intervention without any rehabilitative or cognitive-behavioral component, entirely unlike the integrated approach described here.

97. B. Chiropractors are licensed practitioners whose distinct scope of practice centers on high-velocity, low-amplitude spinal manipulation, a professional field separate from (though with some overlapping manual techniques to) physical therapy and osteopathic medicine, matching this vignette's description precisely. A clinical psychologist provides psychological assessment and therapy, an entirely different scope of practice unrelated to manual spinal manipulation as described in this vignette. An occupational therapist focuses on functional activities of daily living and adaptive equipment, a distinct scope of practice from the spinal manipulation technique described here.

98. C. Reiki is an energy-healing modality in which a practitioner uses light or near-touch hand placement, claiming to channel healing energy, and it is specifically notable among complementary therapies for lacking an established physiologic mechanism and having limited rigorous supporting clinical evidence, matching this vignette's description precisely. Therapeutic massage involves direct, defined manual manipulation of soft tissue with more established physiologic mechanisms (such as muscle tension reduction), which is different from the light/near-touch, mechanism-unclear technique described in this vignette. Acupuncture has a defined (though traditional) theoretical framework involving meridians and needle insertion at specific points, which is a different modality and framework from the light-touch energy-channeling technique described here.

99. A. Diaphragmatic breathing involves slow, deep breaths that expand the abdomen and engage the diaphragm, a technique specifically used to activate the parasympathetic nervous system and reduce physiologic arousal associated with pain and anxiety, matching this vignette's description precisely. Standard aerobic cardiovascular exercise training is a distinct, more vigorous physical activity intervention, not the specific slow-breathing relaxation technique described in this vignette. TENS is an electrical stimulation device, an entirely different physical modality unrelated to the breathing-based relaxation technique described here.

100. B. Mirror therapy uses a mirror to reflect the intact limb into the space where the amputated limb would be, providing visual feedback during movement that is thought to help resolve the sensory-motor mismatch contributing to phantom limb pain, matching this vignette's description and rationale precisely. Standard progressive muscle relaxation does not involve any visual feedback or mirror-based technique, making it a fundamentally different intervention from the one described in this vignette. TENS is an electrical stimulation device applied to skin, an entirely different physical modality from the visual mirror-based technique described here.

101. C. The current, widely adopted formal definition of pain describes it as an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage, deliberately allowing for pain experienced without demonstrable tissue damage, matching this vignette's requirement precisely. Defining pain strictly as the neural nociceptive signal independent of conscious perception describes nociception, not pain itself, which is explicitly a subjective, conscious experience under the accepted definition. Defining pain as always indicating ongoing structural tissue damage directly contradicts the accepted definition's explicit allowance for pain that resembles, but does not require, actual tissue damage.

102. A. Nociception refers to the neural process of encoding and processing noxious stimuli, which can occur even without conscious awareness (as in an unconscious patient), while pain specifically requires conscious, subjective experience, making these related but conceptually distinct terms -- exactly the distinction illustrated in this vignette. Nociception and pain are NOT fully interchangeable; the entire point of this vignette is that nociceptive neural activity can occur without conscious pain experience, directly contradicting a claim of full interchangeability. Nociception is a neural signaling process that can occur independent of consciousness (as the vignette explicitly states with the sedated patient still exhibiting nociceptive pathway activity), so claiming it requires consciousness to occur at all is incorrect.

103. B. Chronic widespread pain conditions show a well-documented, substantially higher prevalence in women, along with recognized associations with psychosocial stressors and familial/genetic predisposition, which is the accurate epidemiologic characterization described in this vignette. This vignette explicitly describes a substantially higher prevalence in women along with specific psychosocial and familial risk factors, directly contradicting a claim of equal prevalence and no meaningful sex-based differences. Chronic widespread pain is understood to be multifactorial, involving genetic predisposition alongside psychosocial and other factors, not caused by a single deterministic gene mutation, making this option an inaccurate oversimplification.

104. C. Fibromyalgia, IBS, TMD, and chronic tension headache are recognized as overlapping central sensitivity syndromes, a clustering of conditions thought to share underlying central sensitization mechanisms and frequently co-occurring in the same individuals, matching this vignette's description precisely. These conditions are specifically recognized as sharing common underlying mechanisms and clustering together more often than chance, directly contradicting a claim that their co-occurrence is purely coincidental and unrelated. These conditions are not classified as manifestations of a single unified autoimmune disease; they are understood through a central sensitization framework rather than an autoimmune, multi-organ disease process.

105. A. Multiple studies have shown that appropriately titrated analgesia does not meaningfully obscure physical exam findings or delay diagnosis and treatment of a surgical abdomen, leading to a shift away from the older "oligoanalgesia" practice of withholding pain treatment pending diagnosis, toward early, appropriate analgesia. Continuing to reflexively withhold analgesia until a definitive diagnosis is established directly contradicts current evidence-based recommendations and represents the outdated practice this vignette is testing recognition of. There is no evidence-based rationale for treating pediatric patients differently in this regard; the shift toward early analgesia for undifferentiated abdominal pain applies across age groups, not selectively withheld in children.

106. B. Patients with obstructive sleep apnea have increased susceptibility to opioid-induced respiratory depression and upper airway obstruction, which is why opioid-minimizing multimodal strategies and enhanced postoperative monitoring are specifically recommended in this population, matching this vignette's clinical rationale precisely. This population has INCREASED, not equivalent, susceptibility to opioid-related respiratory compromise, which is the entire basis for the heightened precautions described

in this vignette, making a claim of no increased sensitivity incorrect. There is no basis for OSA patients requiring higher opioid doses due to increased metabolism; the clinical concern is the opposite -- increased sensitivity to standard or even lower doses -- making this option factually incorrect.

107. A. Residual limb (stump) pain is specifically localized to the actual remaining surgical site tissue, which is distinct from phantom limb sensation or pain, perceived as arising from the absent amputated portion, and this distinction is clinically important for guiding appropriate evaluation and treatment, matching this vignette precisely. These are recognized as distinct clinical entities with different anatomic localization (actual remaining tissue versus the absent limb), so describing them as the same and indistinguishable is incorrect. Residual limb pain commonly occurs in the immediate postoperative period (as in this vignette, "in the immediate days following" surgery), directly contradicting a claim that it only develops years later.

108. B. Local infiltration of the chest tube insertion tract and intercostal space specifically targets and reduces the acute procedural pain of tube placement, serving as a complement to (not a replacement for) systemic analgesia for the patient's broader traumatic injury, which is the correct rationale described in this vignette. Local infiltration provides targeted procedural analgesia for the insertion site itself, not complete surgical-level anesthesia for the entire chest or ongoing traumatic pain, making the claim of eliminating any need for systemic analgesia incorrect. Local infiltration is an analgesic technique for the procedure itself and has no role in preventing pneumothorax recurrence, which is an entirely separate clinical concern from procedural pain control.

109. A. This standardized sedation depth classification (based on the ASA continuum) defines escalating levels of sedation with correspondingly more intensive monitoring requirements at each level, reflecting the increasing risk of airway compromise and cardiorespiratory depression as sedation deepens, which is the correct purpose described in this vignette. While billing may reference sedation level, the primary clinical purpose of this classification is patient safety through appropriately matched monitoring, not merely an administrative billing designation with no bearing on actual care. This sedation depth classification framework applies broadly across both pediatric and adult procedural sedation, not exclusively to pediatric cases, making this option factually incorrect.

110. A. Total body surface area burned is a standardized measure of burn injury extent that correlates with overall injury severity, guiding both fluid resuscitation needs and the anticipated intensity and complexity of the analgesic plan across background and procedural pain components, matching this vignette's description precisely. TBSA is directly relevant to anticipated pain severity and analgesic planning (larger burns generally requiring more extensive multimodal pain management), so claiming no relationship exists is incorrect. TBSA is specifically used to guide fluid resuscitation calculations (such as the Parkland formula) and informs pain management planning; it is not used for antibiotic dosing calculations, making this option factually incorrect.

111. C. Erythema, warmth, and purulent drainage at a peripheral nerve catheter insertion site are signs of catheter site infection, which requires prompt catheter removal, site evaluation, and consideration of

antibiotic therapy as indicated -- the correct and clinically important response to this complication. Progressive erythema, warmth, and purulent drainage are NOT expected, benign findings; they are signs of infection requiring active management, not a "no action" approach. Local anesthetic systemic toxicity presents with neurologic and cardiovascular symptoms (such as perioral numbness, seizures, or arrhythmias) from systemic drug absorption, not with localized erythema and purulent drainage at the catheter site, making this an incorrect diagnosis for the findings described.

112. C. A validated rib fracture risk scoring tool incorporating factors like age, fracture number, and bilaterality helps stratify a patient's risk for pulmonary complications, guiding decisions about analgesic intensity (such as early regional analgesia) and the appropriate level of monitoring, matching this vignette's description and purpose precisely. This scoring tool informs risk stratification and management intensity, not a mandate for a specific surgical fixation technique in every case, since not all rib fracture patients require surgical fixation. This scoring tool is specifically used to identify higher-risk patients who may need MORE intensive management, not to determine blanket eligibility for outpatient management regardless of individual risk factors.

113. B. Traumatic brain injury with altered consciousness presents genuine, population-specific challenges for pain assessment, since standard self-report is unreliable and behavioral scales may be confounded by the neurologic injury itself, requiring careful, population-aware selection or adaptation of observational assessment approaches -- the correct, nuanced conclusion illustrated by this vignette. Pain assessment challenges do not mean assessment should not be attempted at all; clinicians still need to make their best effort at appropriate, adapted assessment despite these challenges, rather than abandoning assessment altogether. The vignette explicitly states the patient cannot reliably self-report using a standard numeric scale due to depressed consciousness, directly contradicting a claim that such scales work equally well in this population as in fully alert patients.

114. C. Trauma-informed care is a framework that recognizes the prevalence and impact of prior trauma exposure, adjusting communication, environment, and care delivery to avoid re-traumatization while still providing effective treatment, matching this vignette's description of the ED training initiative precisely. Universal precautions screening is a distinct, narrower practice specifically focused on opioid misuse risk stratification, not the broader communication and environmental framework described in this vignette. This vignette explicitly describes communication style and environmental adjustments as central components, directly contradicting a description of the initiative as a purely pharmacologic protocol with no such components.

115. B. A structured, non-opioid-first discharge bundle using scheduled acetaminophen/NSAIDs, cold therapy, and activity modification can provide adequate analgesia for many minor ambulatory procedures while minimizing unnecessary opioid exposure and reducing leftover pills available for misuse or diversion, which is the correct, patient-safety-focused rationale for this vignette. While cost may be a secondary consideration in some contexts, the primary and clinically emphasized rationale for this evidence-based approach is patient safety and appropriate opioid stewardship, not cost reduction alone. This option directly contradicts the vignette's own description, which explicitly states opioids are

reserved only for cases where non-opioid measures are expected to be inadequate, not given to every patient regardless of procedure type.

116. A. Adequate acute pain control during active herpes zoster, alongside antiviral therapy, is thought to help reduce the risk or severity of subsequent postherpetic neuralgia by limiting the degree of peripheral and central sensitization during the acute nociceptive barrage, in addition to providing immediate symptomatic comfort -- the correct, clinically important rationale described in this vignette. There is a recognized (though not absolute) association between poorly controlled acute zoster pain and increased risk of subsequent postherpetic neuralgia, so claiming no relationship exists at all is an overstatement that contradicts the clinical rationale for aggressive acute pain treatment. Analgesic treatment provides meaningful benefit beyond antiviral therapy alone, both for immediate comfort and potentially for reducing chronic pain sequelae, making the claim that it offers no additional benefit incorrect.

117. A. Nitrous oxide, delivered as an inhaled gas mixture, provides rapid-onset anxiolysis and mild analgesia with very short recovery time once discontinued, and is commonly used for brief, mildly painful pediatric procedures as a lighter alternative to deeper sedation, matching this vignette's description precisely. Ketamine dissociative sedation is typically administered intravenously (or intramuscularly) rather than as a self-administered inhaled gas, and it produces a deeper dissociative state with a longer recovery profile than the light, rapidly reversible sedation described in this vignette. Propofol produces deep sedation requiring closer airway monitoring and is administered intravenously, not as a self-administered inhaled gas with the rapid, light recovery profile described here.

118. C. The Spurling test reproduces radicular arm pain by narrowing the neural foramen through neck extension, lateral rotation toward the symptomatic side, and axial compression, making it the classic provocative test for cervical radiculopathy, matching this vignette exactly. Lumbar radiculopathy and the straight leg raise test involve an entirely different anatomic region (the lumbar spine and leg), not the cervical/arm presentation described in this vignette. Cervical myelopathy, assessed with signs like the Hoffman sign, reflects spinal cord compression producing upper motor neuron findings, a different pathophysiology from the nerve root-specific radicular pain and Spurling test described here.

119. B. Cervical facet joint pain classically worsens with extension and rotation (movements that load the posterior facet joints) and improves with flexion, with associated posterior facet tenderness and without arm radiation, matching this vignette's presentation precisely. The cervical disc typically produces pain patterns more associated with flexion and axial loading, and disc herniation is more classically associated with radicular arm symptoms, which are absent in this vignette. Cervical nerve root involvement would be expected to produce radicular arm pain in a dermatomal distribution, which is explicitly absent in this vignette's presentation, making it an inconsistent source for this patient's symptoms.

120. B. Acute torticollis (wry neck) presents with sudden-onset neck pain and a characteristic head tilt with contralateral chin rotation, typically arising from acute muscular or soft-tissue strain without

trauma or neurologic deficit, matching this vignette's benign, self-limited presentation precisely. Cervical spinal cord injury would be expected to present with neurologic deficits (weakness, sensory loss) and typically a history of significant trauma, both of which are explicitly absent in this vignette. Septic arthritis of the cervical facet joint would be expected to present with systemic signs of infection (fever, elevated inflammatory markers) rather than the benign, isolated presentation described in this vignette.

121. C. A SLAP lesion involves injury to the superior glenoid labrum at the biceps tendon anchor, classically presenting with deep shoulder pain and catching/popping sensations during overhead activity in athletes, matching this vignette's presentation and anatomic description precisely. Adhesive capsulitis presents with progressive, global loss of both active and passive range of motion rather than the catching/popping mechanical symptom described in this vignette. Acromioclavicular joint separation presents with focal pain and deformity at the AC joint from direct trauma, not the deep labral catching symptom and overhead-activity pattern described here.

122. B. Biceps tendinopathy presents with anterior shoulder pain reproduced by resisted elbow flexion and forearm supination (the biceps' actions), along with tenderness along the bicipital groove where the tendon travels, matching this vignette's presentation precisely. Subacromial impingement is provoked by different maneuvers (Neer and Hawkins tests involving arm elevation/internal rotation) rather than resisted elbow flexion/supination, making it a less specific match for this particular symptom pattern. Adhesive capsulitis presents with global active and passive range of motion restriction, not the localized, resisted-motion-provoked anterior shoulder pain described in this vignette.

123. B. Scapular dyskinesis refers to abnormal, asymmetric scapular movement patterns, including visible winging, that can alter shoulder mechanics and contribute to secondary impingement symptoms, matching this vignette's description of abnormal scapular motion precisely. Adhesive capsulitis is a glenohumeral joint capsule condition causing global motion restriction, not a description of abnormal scapular movement pattern itself. Acromioclavicular joint separation is a distinct traumatic injury to the AC joint, not a description of a dynamic scapular movement abnormality as described in this vignette.

124. C. A meniscal tear classically presents with catching or locking sensations after a twisting knee injury, and the McMurray test (passive flexion/extension with rotational stress and joint line palpation) is the classic provocative maneuver for meniscal pathology, matching this vignette's mechanism and test description precisely. The anterior cruciate ligament is assessed with the Lachman test, which evaluates anterior tibial translation rather than the rotational catching/locking maneuver described in this vignette. The lateral collateral ligament is assessed with varus stress testing, a different maneuver evaluating lateral joint stability, not the catching/locking meniscal presentation described here.

125. A. This mechanism (noncontact pivot injury with an audible pop, immediate swelling, and instability) combined with increased anterior tibial translation on the described maneuver is the classic presentation of an ACL tear, and the Lachman test (anterior force with the knee flexed 20-30 degrees) is the most sensitive clinical test for this injury, matching this vignette precisely. The McMurray test

evaluates for meniscal pathology using a different rotational maneuver, not the anterior translation testing described in this vignette. The posterior drawer test evaluates the posterior cruciate ligament by assessing posterior (not anterior) tibial translation, which is the opposite direction of instability described in this vignette.

126. A. Iliotibial band syndrome results from repetitive friction of the IT band over the lateral femoral epicondyle during running's repetitive knee flexion-extension cycle, producing sharp lateral knee pain with point tenderness at that specific location, matching this vignette's presentation and mechanism precisely. Patellofemoral pain syndrome produces anterior knee pain related to patellar tracking issues, a different anatomic location from the lateral knee pain described in this vignette. A Baker's cyst produces posterior knee pain and swelling from a popliteal fluid collection, an entirely different anatomic location from the lateral knee pain described here.

127. C. A Baker's cyst is a fluid-filled swelling in the popliteal fossa, often arising secondary to underlying knee joint pathology such as osteoarthritis, becoming more prominent with knee extension and producing a sensation of posterior fullness or tightness, matching this vignette's presentation precisely. Iliotibial band syndrome produces lateral knee pain from friction over the lateral epicondyle, an entirely different anatomic location from the posterior popliteal swelling described in this vignette. An ACL tear produces anterior knee instability and typically an acute traumatic presentation, not the posterior fluctuant swelling described here.

128. B. Patellofemoral pain syndrome presents with anterior knee pain worsened by prolonged sitting, squatting, and stair climbing, related to abnormal patellar tracking and loading against the femoral trochlea, without mechanical locking or effusion, matching this vignette's presentation precisely. A meniscal tear would be expected to produce mechanical locking or catching symptoms, which are explicitly absent in this vignette, making it an inconsistent choice. A Baker's cyst produces posterior knee swelling, an entirely different anatomic location from the anterior patellar pain pattern described in this vignette.

129. B. Morton's neuroma is a benign, perineural fibrotic enlargement of an interdigital nerve, classically occurring between the third and fourth toes, producing sharp, burning forefoot pain and a sensation of a foreign object underfoot, worsened by narrow footwear, matching this vignette's presentation precisely. Plantar fasciitis produces heel pain worst with first steps in the morning, an entirely different location and pattern from the forefoot interdigital pain described in this vignette. Achilles tendinopathy produces posterior ankle/heel pain, a different anatomic location from the forefoot pain between the toes described here.

130. A. Hallux valgus (bunion) is a progressive deformity characterized by lateral deviation of the great toe and a prominent, often painful, medial first metatarsal head, worsened by tight footwear, matching this vignette's presentation and description precisely. Morton's neuroma produces pain specifically between the third and fourth toes without the great toe deformity and bony prominence described in this

vignette. Plantar fasciitis produces heel pain worst on first steps in the morning, an entirely different location and presentation from the great toe deformity described here.

131. B. Diffuse idiopathic skeletal hyperostosis is characterized by flowing calcification and ossification along the anterolateral vertebral bodies across multiple contiguous levels, with relatively preserved disc height and no significant sacroiliac joint erosion, distinguishing it from inflammatory spondyloarthropathies, matching this vignette's imaging findings precisely. Ankylosing spondylitis classically involves sacroiliac joint erosion and fusion as a hallmark early finding, which is explicitly absent in this vignette, making it an inconsistent choice for this imaging pattern. An osteoporotic vertebral compression fracture would show acute vertebral body height loss rather than the flowing ossification with preserved disc height and vertebral height described in this vignette.

132. C. Baastrup's disease results from close approximation and repetitive contact between adjacent spinous processes, particularly with extension, producing reactive bony changes at the contact point and pain that improves with flexion (which increases the interspinous distance), matching this vignette's imaging and symptom pattern precisely. Lumbar disc herniation would be expected to show a disc abnormality and often produce radicular leg symptoms, not the specific interspinous "kissing spine" contact pattern described in this vignette. Sacroiliac joint dysfunction produces pain localized to the SI joint region with a different provocative pattern (positive FABER/thigh thrust), not the extension-worsened, spinous-process-contact pattern described here.

133. A. Inflammatory sacroiliitis, occurring as part of a systemic spondyloarthropathy, shows characteristic imaging findings of joint erosion, sclerosis, and progressive fusion, which are distinct from mechanical SI joint dysfunction, a biomechanical pain source typically without these structural inflammatory changes on imaging -- the correct distinction described in this vignette. These two entities are clinically and radiographically distinct (inflammatory sacroiliitis has a systemic disease context and characteristic erosive imaging findings that mechanical dysfunction lacks), so describing them as identical in every respect is incorrect. Mechanical SI joint dysfunction does NOT show more severe erosion than inflammatory sacroiliitis; in fact, the opposite pattern is true, with inflammatory sacroiliitis being defined by these structural erosive changes that mechanical dysfunction lacks.

134. A. Psoriatic arthritis is classically associated with dactylitis (diffuse "sausage digit" swelling of an entire finger), characteristic nail changes such as pitting and onycholysis, and coexisting psoriatic skin disease, matching this vignette's combination of joint, nail, and skin findings precisely. Osteoarthritis produces Heberden and Bouchard nodes at specific joints without the diffuse whole-digit swelling, nail changes, or associated skin rash described in this vignette. Gout produces acute, severe monoarticular inflammation (classically the great toe) rather than the chronic dactylitis and associated nail/skin findings described in this vignette.

135. B. Reactive arthritis is a post-infectious inflammatory arthritis, classically following gastrointestinal or genitourinary infection by two to four weeks, associated with the triad of arthritis, conjunctivitis, and urethritis, matching this vignette's presentation and timeline precisely. Rheumatoid

arthritis produces symmetric small joint involvement with positive rheumatoid serologies, a different pattern from the asymmetric, post-infectious, larger-joint presentation with conjunctivitis and urethritis described in this vignette. Osteoarthritis is a degenerative, non-inflammatory process unrelated to preceding infection, which does not match this vignette's clear post-infectious inflammatory presentation and associated extra-articular findings.

136. A. Dupuytren's contracture results from progressive thickening and fibrosis of the palmar fascia, producing a palpable cord and nodule with progressive finger flexion contracture (classically affecting the ring and small fingers), typically without significant pain, matching this vignette's presentation precisely. Carpal tunnel syndrome produces numbness and tingling from median nerve compression, not the painless palmar cord and progressive flexion contracture described in this vignette. De Quervain tenosynovitis produces radial-sided wrist pain reproduced by the Finkelstein test, an entirely different presentation and anatomic location from the palmar cord and finger contracture described here.

137. C. Adult degenerative (de novo) scoliosis arises from age-related, asymmetric disc and facet joint degeneration in a spine without a prior childhood structural curve, often producing chronic low back pain and secondary spinal stenosis symptoms in older adults, matching this vignette's presentation and mechanism precisely. Adolescent idiopathic scoliosis is a structural curve with childhood/adolescent onset, an entirely different mechanism and patient population from the age-related degenerative process described in this vignette. Ankylosing spondylitis produces a classic "bamboo spine" fusion pattern from inflammatory disease, a fundamentally different mechanism from the degenerative, asymmetric curve described here.

138. C. A ganglion cyst is a fluid-filled swelling arising from a joint capsule or tendon sheath, classically located on the dorsal wrist, that can fluctuate in size and cause discomfort with certain positions without necessarily being significantly painful, matching this vignette's description precisely. De Quervain tenosynovitis produces pain at the radial wrist reproduced by the Finkelstein maneuver, not a soft fluctuant swelling as the primary finding described in this vignette. Dupuytren's contracture produces a palmar cord with finger contracture, an entirely different anatomic location and presentation from the dorsal wrist swelling described here.

139. A. Snapping hip syndrome results from a tendon, commonly the iliotibial band over the greater trochanter or the iliopsoas tendon over the iliopectineal eminence, sliding audibly or palpably over a bony prominence during hip movement, often without significant pain, matching this vignette's description and mechanism precisely. Greater trochanteric pain syndrome presents with lateral hip point tenderness and pain, particularly with lying on the affected side, rather than the snapping sensation without significant pain described in this vignette. Meralgia paresthetica presents with numbness and tingling (a sensory nerve entrapment), not the mechanical snapping sensation described here.

140. B. Medial tibial stress syndrome, commonly known as shin splints, presents with diffuse aching pain along the inner shin border related to repetitive periosteal and soft tissue stress from increased training load, without a focal point of severe tenderness, matching this vignette's presentation precisely.

A stress fracture would be expected to produce a more focal point of severe bony tenderness, which is explicitly absent in this vignette's diffuse presentation. Chronic exertional compartment syndrome classically produces pain at a predictable, reproducible exercise threshold with tightness/pressure rather than the diffuse aching along the shin described in this vignette.

141. B. A stress fracture results from repetitive submaximal mechanical loading that exceeds bone's capacity for repair over time, producing progressively worsening, focal bony tenderness and eventually a visible fracture line on imaging, without a single traumatic event, matching this vignette's presentation and progression precisely. Medial tibial stress syndrome produces diffuse, non-focal tenderness rather than the focal point of severe tenderness and confirmed fracture line described in this vignette. Chronic exertional compartment syndrome produces pain/tightness tied to a specific exercise threshold that resolves with rest, not a progressive, focal bony tenderness with a confirmed fracture line as described here.

142. C. Chronic exertional compartment syndrome presents with reproducible pain, tightness, and sometimes numbness that reliably occurs after a consistent duration or intensity of exercise and resolves within minutes of stopping, with normal findings between episodes, matching this vignette's classic presentation precisely. Acute compartment syndrome is a surgical emergency with continuously worsening, severe pain out of proportion to injury, not the episodic, exercise-triggered, spontaneously resolving pattern described in this vignette. Medial tibial stress syndrome typically produces more diffuse, persistent aching that does not resolve as promptly or completely between episodes as the pattern described in this vignette.

143. C. The concept of "total pain," originally articulated by Dame Cicely Saunders, recognizes that suffering in serious illness encompasses physical, psychological, social, and spiritual dimensions, all of which must be assessed and addressed together, matching this vignette's comprehensive, multidimensional assessment precisely. The WHO analgesic ladder is a purely pharmacologic framework for stepwise escalation of pain medications, not a broader biopsychosocial-spiritual assessment model as described in this vignette. Mirels' criteria is an orthopedic oncology fracture risk scoring tool, entirely unrelated to the multidimensional suffering assessment concept described here.

144. B. Malignant brachial plexopathy results from direct tumor invasion of the brachial plexus, classically seen with apical lung tumors (Pancoast tumors), producing progressive pain, weakness, and sensory loss across multiple nerve root distributions rather than a single-level pattern, matching this vignette precisely. A simple cervical radiculopathy from a single-level disc herniation would be expected to affect a single nerve root distribution, not the multi-root plexus involvement pattern described in this vignette. Carpal tunnel syndrome is a distal median nerve entrapment at the wrist, an entirely different anatomic location and mechanism from the proximal, tumor-invasive brachial plexopathy described here.

145. A. Postmastectomy pain syndrome is a recognized chronic neuropathic pain condition following breast cancer surgery, presenting with persistent burning or aching pain in the chest wall, axilla, and

medial arm, related to intercostobrachial nerve injury during surgery, in the absence of recurrent disease, matching this vignette precisely. Acute postoperative incisional pain would be expected to resolve within days to a couple of weeks, not persist for months as described in this chronic vignette. This vignette explicitly states there is no evidence of cancer recurrence, directly ruling out malignant brachial plexopathy from tumor recurrence as the explanation for this patient's chronic pain.

146. A. Post-thoracotomy pain syndrome is a recognized chronic neuropathic pain condition arising from intercostal nerve injury during thoracic surgery, presenting as persistent burning incisional/chest wall pain lasting months after surgery, unrelated to recurrent disease, matching this vignette precisely. Acute pleuritic chest pain from a new pneumonia would present with an acute infectious clinical picture (fever, cough, new infiltrate) rather than the chronic, months-long neuropathic pain pattern described in this vignette. A malignant pleural effusion would be expected to show a fluid collection on imaging and typically produce dyspnea alongside chest discomfort, not the specific chronic neuropathic incisional pain pattern described here.

147. C. Chemotherapy-induced oral mucositis results from cytotoxic injury to rapidly dividing oral mucosal cells, producing severe, painful ulceration that impairs oral intake, and it illustrates that treatment-related toxicity, not only the malignancy itself, is an important and sometimes underrecognized source of cancer-related pain requiring its own targeted management approach. Chemotherapy-induced peripheral neuropathy is a distinct complication affecting distal peripheral nerves (hands and feet), not the oral mucosal ulceration described in this vignette. Malignant bowel obstruction produces colicky abdominal pain from a distinct mechanism (bowel obstruction), entirely unrelated to the oral mucosal injury described in this vignette.

148. C. Cancer survivors can experience persistent chronic pain from lasting treatment-related effects, such as surgical neuropathic pain syndromes, radiation fibrosis, or chemotherapy-induced neuropathy, even after successful cure, representing a distinct and clinically important population requiring dedicated ongoing pain management, which is the correct concept illustrated in this vignette. While new or worsening pain in a cancer survivor should always prompt appropriate evaluation for recurrence, chronic pain from lasting treatment effects is a well-recognized, common phenomenon in survivorship and does not universally indicate recurrent disease, making this option's absolute claim incorrect. Cancer survivorship pain follows recognized general chronic pain principles (such as neuropathic and central sensitization mechanisms) that overlap substantially with other chronic pain populations, rather than being managed through an entirely separate, unrelated physiologic framework.

149. B. Specific imaging features, such as posterior element (pedicle) involvement, an associated soft tissue mass, and multiple non-contiguous lesions, can help radiologists distinguish a pathologic fracture from metastatic disease from a simple osteoporotic compression fracture, which typically spares the posterior elements and lacks a soft tissue mass, matching this vignette's description precisely. While overlap can occur in some cases, there ARE recognized distinguishing imaging features between these two entities, making a claim that they are indistinguishable in all cases and that additional imaging is never helpful an overstatement that contradicts real diagnostic practice. While biopsy remains the

definitive diagnostic tool in ambiguous cases, imaging characteristics do provide genuinely useful diagnostic information short of biopsy, making the claim that only biopsy is ever helpful an overstatement.

150. A. Radiation-induced plexopathy classically presents with painless or relatively less painful progressive weakness and sensory changes, sometimes with lymphedema and myokymia on EMG, whereas malignant plexopathy from tumor recurrence classically presents with severe, prominent pain as an early and dominant feature, which is a clinically useful distinguishing pattern described in this vignette. Radiation-induced plexopathy characteristically has a delayed onset, often years after radiation therapy (not within days), directly contradicting this option's claim about timing, and tumor recurrence certainly can cause plexopathy at various intervals, making this option factually incorrect on both counts. This distinction is clinically meaningful and does influence management (such as the need for further imaging or biopsy to rule out recurrence), so claiming there is no clinically useful distinction or management implication is incorrect.

151. C. Superior vena cava syndrome results from compression or obstruction of the superior vena cava, commonly by a mediastinal mass, producing venous congestion with facial and upper extremity swelling, distended neck veins, and pressure-related chest discomfort, matching this vignette's presentation and mechanism precisely. Malignant epidural spinal cord compression presents with back pain, leg weakness, and bowel/bladder dysfunction from spinal canal compression, an entirely different anatomic process from the vascular compression described in this vignette. Chemotherapy-induced peripheral neuropathy produces distal sensory symptoms in the hands and feet, unrelated to the central vascular compression and facial/neck swelling described in this vignette.

152. A. Leptomeningeal carcinomatosis results from metastatic tumor cell seeding of the meninges and cerebrospinal fluid, producing headache (often positional), cranial nerve palsies, and diffuse neurologic dysfunction, with malignant cells confirmed on CSF cytology, matching this vignette's presentation and diagnostic finding precisely. Simple tension-type headache would not be expected to present with cranial nerve palsies, altered mental status, or malignant cells in the CSF, all of which point to a serious underlying neurologic process rather than a primary benign headache disorder. Medication overuse headache is related to chronic daily analgesic use, not the finding of malignant cells in the CSF and cranial nerve involvement described in this vignette, making it an inconsistent and far less serious explanation.

153. C. A substantial body of evidence documents persistent disparities in cancer pain treatment across certain populations, including racial/ethnic minorities and resource-limited settings, even after accounting for clinical factors like pain severity and cancer type, highlighting genuine access and equity barriers that warrant dedicated attention in cancer pain management -- the accurate conclusion illustrated by this vignette. This vignette explicitly describes well-documented disparities from multiple studies, directly contradicting a claim that such disparities do not exist or have never been documented. The vignette explicitly states these disparities persist "even when controlling for pain severity and cancer

type," directly contradicting a claim that cancer type alone fully explains the observed undertreatment differences.

154. A. Cancer-related fatigue and pain have a well-recognized bidirectional, mutually reinforcing relationship, in which each symptom can worsen the other, meaning comprehensive management often requires attention to both together rather than treating either symptom in complete isolation, which is the accurate concept illustrated in this vignette. This vignette explicitly describes fatigue worsening pain perception and poorly controlled pain worsening fatigue in a reinforcing cycle, directly contradicting a claim that these symptoms are entirely independent with no meaningful interaction. Cancer-related fatigue has multiple contributing causes beyond opioid medication, including the disease process itself, anemia, deconditioning, and psychological factors, so attributing it exclusively to opioid side effects is an inaccurate oversimplification.

155. B. Biliary colic results from transient obstruction of the cystic duct by a gallstone, producing postprandial right upper quadrant pain radiating to the right shoulder or scapula, typically without fever, significant tenderness, or ultrasound evidence of gallbladder wall inflammation, matching this vignette's presentation and imaging findings precisely. Acute cholecystitis would be expected to show gallbladder wall thickening and pericholecystic fluid on ultrasound, along with fever and significant tenderness, none of which are present in this vignette, making it an inconsistent diagnosis. Acute pancreatitis would be expected to present with epigastric pain radiating to the back and elevated lipase, not the right upper quadrant, gallstone-related presentation described in this vignette.

156. B. Diaphragmatic irritation from blood or injury near the diaphragm (such as splenic injury) is referred to the shoulder because the phrenic nerve, which innervates the diaphragm, arises from the same C3-C5 spinal segments that supply shoulder sensation, producing this classic referred pain pattern known as Kehr's sign. There is no direct anatomic mechanism by which a splenic injury would mechanically compress the brachial plexus, which is located in the neck/shoulder region far from the spleen, making this an implausible explanation. While a coincidental shoulder injury is theoretically possible in a trauma setting, the well-recognized, classic explanation for this specific referred pain pattern in splenic injury is diaphragmatic irritation via shared phrenic/C3-C5 innervation, not an unrelated coincidental injury.

157. C. Appendicitis is the classic teaching example of pain migration from initial visceral, poorly localized periumbilical pain (reflecting early appendiceal distension) to later somatic, well-localized right lower quadrant pain as the inflamed appendix irritates the adjacent parietal peritoneum, matching this vignette's description precisely. This vignette explicitly describes an initial vague, poorly localized (visceral) phase, directly contradicting a description of the pain as purely somatic from the outset. This vignette explicitly describes a migration and change in pain character over time, directly contradicting a description of the pain remaining purely visceral and unchanged throughout the presentation.

158. C. Duodenal ulcer disease classically presents with epigastric pain occurring 2-3 hours after meals (when acid secretion continues without the buffering effect of food) that is relieved by eating or

antacids, matching this vignette's pattern and endoscopic confirmation precisely. Acute pancreatitis produces pain radiating to the back that is typically worsened, not relieved, by eating, which is the opposite pattern from the meal-relieved pain described in this vignette. Biliary colic produces right upper quadrant pain radiating to the shoulder, a different location and referral pattern from the epigastric, meal-relieved pain described in this vignette.

159. B. Gastroparesis, often related to diabetic autonomic/vagal neuropathy, causes delayed gastric emptying without mechanical obstruction, leading to gastric distension that produces early satiety, postprandial fullness, nausea, and bloating, matching this vignette's presentation, testing, and mechanism precisely. Acute cholecystitis produces right upper quadrant pain with gallbladder wall inflammation on imaging, an entirely different condition and mechanism from the delayed gastric emptying described in this vignette. Peptic ulcer disease would show a mucosal defect on endoscopy, which is not the finding described in this vignette; here, the confirmed abnormality is delayed gastric emptying on nuclear medicine testing, not a structural ulcer.

160. B. A ruptured ovarian cyst typically causes sudden, severe pain at the moment of rupture that is often self-limited as the acute peritoneal irritation from the released fluid/blood resolves, whereas ovarian torsion classically presents with persistent, severe pain that does not improve without surgical intervention to relieve the vascular compromise, making this the correct distinguishing clinical course. Ruptured ovarian cyst pain is not always more severe or prolonged than torsion, and it does not universally require emergent surgery, since many cases are managed conservatively once torsion has been excluded, making this option's absolute claim incorrect. There IS a clinically meaningful difference in expected course between these two conditions (self-limited versus persistent and surgery-requiring), which is precisely the distinction being tested in this vignette, making a claim of no meaningful difference incorrect.

161. A. Levator ani syndrome results from chronic spasm of the levator ani pelvic floor muscles, producing a dull, chronic rectal pain and pressure sensation, worse with prolonged sitting, without a structural anorectal lesion, matching this vignette's presentation and description precisely. Proctalgia fugax presents with brief, severe, self-limited episodes of rectal pain (often waking the patient at night) rather than the chronic, dull, positionally-worsened pattern described in this vignette. Hemorrhoidal disease would be expected to show a visible structural finding (hemorrhoids) on exam, which this vignette explicitly states is absent, making it an inconsistent diagnosis for this presentation.

162. C. Proctalgia fugax is characterized by brief, severe, self-limited episodes of rectal pain, often occurring at night and waking the patient, lasting seconds to minutes and resolving completely with a normal exam between episodes, matching this vignette's presentation precisely. Levator ani syndrome produces more chronic, dull, positionally-related pain rather than the brief, severe, self-limited episodic pattern described in this vignette. A chronic anal fissure would be expected to show a visible mucosal tear on exam and pain classically reproduced by defecation, neither of which is described in this vignette's presentation of brief, spontaneous, self-limited episodes.

163. B. Hemicrania continua is defined by a continuous, strictly unilateral headache with superimposed autonomic exacerbations, and its hallmark diagnostic feature is complete, absolute responsiveness to indomethacin, which is essentially required to confirm the diagnosis and matches this vignette precisely. Migraine without aura is typically episodic rather than continuous, and it does not have the characteristic absolute indomethacin responsiveness that defines hemicrania continua. Tension-type headache is typically bilateral rather than strictly unilateral, and it also lacks the diagnostic absolute indomethacin response described in this vignette.

164. A. Paroxysmal hemicrania is a trigeminal autonomic cephalalgia characterized by shorter (2-30 minute), more frequent unilateral periorbital attacks with autonomic features than cluster headache, and it is defined by absolute responsiveness to indomethacin, matching this vignette's attack duration, frequency, and treatment response precisely. Classic cluster headache attacks last longer (15-180 minutes) and are not characteristically defined by absolute indomethacin responsiveness, distinguishing it from the shorter, indomethacin-responsive attacks described in this vignette. Chronic migraine is defined by 15 or more headache days per month of typically longer-duration migraine attacks, not the specific short, frequent, indomethacin-responsive attack pattern described here.

165. C. Occipital neuralgia reflects a specific, focal entrapment or irritation of the greater or lesser occipital nerve itself, producing pain reproduced by direct palpation over the nerve, which is mechanistically and clinically distinct from cervicogenic headache's broader pain referral from cervical spine structures such as the upper cervical facet joints. These two conditions are recognized as distinct clinical entities with different underlying mechanisms (focal nerve entrapment versus broader referred pain from cervical structures), so describing them as the same and indistinguishable is incorrect. Occipital neuralgia is not always caused by cervical facet pathology; it reflects direct nerve entrapment/irritation, which is a mechanistically distinct process from the facet-referral mechanism of cervicogenic headache, making this option's claim of identical mechanism incorrect.

166. A. Idiopathic intracranial hypertension presents with progressive headache worse with straining or lying down, transient visual obscurations, pulsatile tinnitus, papilledema, and elevated CSF opening pressure with otherwise normal CSF composition and normal imaging (ruling out a mass lesion), matching this vignette's presentation and workup precisely, and it classically occurs in young women with obesity. Classic migraine with aura would not be expected to produce papilledema or an elevated CSF opening pressure, both of which point to a genuine intracranial pressure disorder rather than a primary migraine process. Medication overuse headache is related to chronic analgesic use and would not explain papilledema or elevated CSF opening pressure, both objective findings pointing to a specific intracranial pressure disorder rather than this different headache mechanism.

167. A. Burning mouth syndrome is a chronic oral pain condition presenting with a persistent burning sensation of the tongue and oral mucosa, typically in postmenopausal women, in the absence of an identifiable structural or local cause after thorough workup, matching this vignette's presentation and negative workup precisely. Trigeminal neuralgia produces brief, electric shock-like facial pain paroxysms triggered by touch, an entirely different pain quality, duration, and location from the

persistent oral burning sensation described in this vignette. Temporomandibular disorder produces jaw pain related to joint or muscle dysfunction with movement-related findings, not the diffuse oral mucosal burning sensation described in this vignette.

168. B. Persistent idiopathic facial pain, previously termed atypical facial pain, is a chronic, poorly localized, constant facial pain condition without an identifiable structural, dental, sinus, or classic neuralgic cause after thorough workup, matching this vignette's description and negative diagnostic findings precisely. Classic trigeminal neuralgia produces brief, triggered, electric shock-like pain paroxysms, an entirely different pattern from the constant, poorly localized ache without clear triggers described in this vignette. Acute sinusitis would be expected to show purulent nasal discharge and other signs of active sinus infection, none of which are described in this vignette's presentation of chronic pain with a negative structural workup.

169. C. Charcot-Marie-Tooth disease is a hereditary sensorimotor neuropathy presenting with progressive distal weakness and sensory loss, characteristic foot deformities such as pes cavus and hammer toes, a clear multigenerational family history, and markedly reduced nerve conduction velocities, matching this vignette's presentation precisely. Diabetic peripheral neuropathy is an acquired, metabolic condition without the foot deformities or clear hereditary pattern across generations described in this vignette. Guillain-Barre syndrome is an acute, rapidly progressive autoimmune demyelinating neuropathy, not the chronic, hereditary, structurally deforming process with a clear family history described in this vignette.

170. A. Subacute combined degeneration results from vitamin B12 deficiency and classically affects both the dorsal columns (producing sensory ataxia and proprioceptive loss) and the corticospinal tracts (producing weakness and upper motor neuron signs), matching this vignette's combined sensory and motor tract involvement and low B12 level precisely. Alcohol-related peripheral neuropathy is specifically related to thiamine deficiency in the context of heavy alcohol use, not the vitamin B12 deficiency and strict vegan diet history described in this vignette. Charcot-Marie-Tooth disease is a hereditary condition with a family history and characteristic foot deformities, not an acquired nutritional deficiency process as described in this vignette.

171. B. Uremic neuropathy results from the accumulation of uremic toxins in chronic kidney disease and end-stage renal disease, producing a symmetric, distal, length-dependent sensorimotor neuropathy with burning pain, numbness, and restless leg symptoms, matching this vignette's presentation and clinical context precisely. This neuropathy results from the systemic metabolic effects of kidney failure, not from direct mechanical trauma from a dialysis catheter, which would not explain the described symmetric, length-dependent, bilateral pattern. This vignette provides no family history or other evidence suggesting a hereditary process, and the neuropathy is directly attributable to the patient's underlying chronic kidney disease, making an unrelated hereditary cause an unsupported explanation.

172. B. Paraneoplastic sensory neuropathy is an autoimmune process in which antibodies associated with an underlying malignancy (such as small cell lung cancer) attack neural tissue, producing sensory

neuropathy independent of any chemotherapy exposure, matching this vignette's timing (before treatment) and autoantibody finding precisely. This vignette explicitly states the neuropathy occurred before any chemotherapy was administered, directly ruling out chemotherapy-induced peripheral neuropathy as the explanation. This vignette provides no history or findings suggesting diabetes, and the specific finding of malignancy-associated autoantibodies points to a paraneoplastic autoimmune mechanism rather than a metabolic diabetic process.

173. C. Erythromelalgia is classically associated with gain-of-function mutations in the SCN9A gene (encoding the Nav1.7 sodium channel), producing episodic burning pain, redness, and warmth of the extremities, triggered by warmth or exercise and relieved by cooling, matching this vignette's presentation and genetic mechanism precisely. Raynaud phenomenon produces episodic pallor and cyanosis triggered by COLD (the opposite trigger) rather than the warmth-triggered redness and warmth described in this vignette. CRPS Type I follows a precipitating injury and does not have the specific SCN9A gain-of-function genetic mechanism described in this vignette, making it an inconsistent match for this specific presentation.

174. B. Congenital insensitivity to pain can result from loss-of-function mutations in SCN9A (the same gene in which gain-of-function mutations cause erythromelalgia), leading to absent nociceptive signaling and repeated unnoticed injuries, matching this vignette's presentation and genetic finding precisely, illustrating how opposite mutations in the same channel produce opposite pain phenotypes. CRPS involves heightened, not absent, pain sensitivity, which is the opposite of the complete pain insensitivity described in this vignette. This vignette specifically describes a genetic channelopathy (SCN9A loss-of-function), directly contradicting a description of the condition as an acquired process unrelated to any genetic mechanism.

175. A. Radiculopathy produces symptoms following a specific dermatomal and myotomal distribution corresponding to a single affected nerve root, while peripheral polyneuropathy typically produces a symmetric, distal, length-dependent ("stocking-glove") pattern not restricted to any single nerve root, which is the key distinguishing clinical feature between these two entities. These two conditions are clinically and electrodiagnostically distinguishable based on their distribution pattern (single root versus diffuse symmetric distal pattern), so claiming they are indistinguishable in all cases is incorrect. Peripheral polyneuropathy specifically does NOT follow a single dermatomal distribution; its defining feature is a diffuse, symmetric, length-dependent pattern, which is the opposite of the single-root pattern that defines radiculopathy, making this option factually backward.

176. B. Wallenberg syndrome, from a lateral medullary infarct, classically produces a dissociated ("crossed") pattern of ipsilateral facial and contralateral body pain/temperature sensory loss due to involvement of the trigeminal nucleus and spinothalamic tract, along with ataxia, and can later produce chronic central pain in the affected distribution, matching this vignette's presentation precisely. An anterior cerebral artery infarct classically affects the medial frontal lobe, producing leg-predominant weakness and behavioral changes, not the specific crossed sensory loss pattern described in this vignette.

A middle cerebral artery infarct produces contralateral face/arm-predominant weakness and sensory loss on one side, not the characteristic crossed, dissociated pattern described in this vignette.

177. A. Syringomyelia produces a fluid-filled cavity within the spinal cord, classically damaging the decussating spinothalamic tract fibers near the central canal, producing the characteristic cape-like dissociated sensory loss (pain/temperature loss with preserved touch/proprioception) and associated chronic central pain, matching this vignette's presentation and imaging finding precisely. Guillain-Barre syndrome is an acute, rapidly progressive peripheral demyelinating process, not a chronic spinal cord cavitation lesion as described in this vignette. Carpal tunnel syndrome is a peripheral nerve entrapment at the wrist, an entirely different anatomic level and mechanism from the central spinal cord process described in this vignette.

178. C. Neuralgic amyotrophy (Parsonage-Turner syndrome) presents with sudden, severe shoulder pain followed by profound shoulder girdle weakness as the pain subsides, often idiopathic or triggered by a preceding viral illness or vaccination, without direct trauma, matching this vignette's characteristic pain-then-weakness pattern and triggers precisely. Malignant brachial plexopathy from tumor invasion would be expected to show evidence of an underlying malignancy and typically a more gradually progressive rather than acute, self-limited pain-then-weakness pattern. Cervical radiculopathy from disc herniation would typically show a corresponding single-level abnormality on imaging and a different symptom pattern (pain and radicular symptoms occurring together, not the sequential pain-then-weakness evolution described in this vignette).

179. C. Lhermitte's sign is an electric shock-like sensation shooting down the spine and into the limbs, specifically triggered by neck flexion, and it suggests a demyelinating lesion affecting the dorsal columns of the cervical spinal cord, classically seen in multiple sclerosis, matching this vignette's description and trigger precisely. This is a well-recognized, clinically significant finding directly related to the underlying demyelinating disease process, not a normal, unrelated finding, making that option incorrect. Trigeminal neuralgia produces facial pain related to trigeminal nerve root entry zone demyelination, an entirely different anatomic location and trigger (facial touch, not neck flexion) from the spinal phenomenon described in this vignette.

180. A. Failed back surgery syndrome describes persistent or recurrent pain after spine surgery despite technically adequate decompression, often with a significant neuropathic component related to factors like epidural scarring and ongoing nerve root sensitization, matching this vignette's presentation and mechanism precisely. Acute postoperative pain would be expected to resolve within days to weeks, not persist for months as described in this chronic vignette. Cauda equina syndrome is an acute surgical emergency with rapidly progressive bowel/bladder dysfunction and saddle anesthesia, not the chronic, stable, persistent pain pattern described in this vignette.

181. A. Vulvodynia is defined as chronic vulvar pain, often burning in quality and localized to the vestibule, with allodynia to light touch (such as cotton swab testing) and no identifiable infectious, dermatologic, or structural cause after thorough evaluation, matching this vignette's presentation and

negative workup precisely. Acute vulvovaginal candidiasis would show visible discharge and erythema on exam along with a positive fungal culture or microscopy, none of which are described in this vignette's negative workup. A Bartholin gland abscess would present with a palpable, fluctuant, often acutely painful mass, a distinct structural finding not described in this vignette's presentation of diffuse pain without identifiable structural pathology.

182. B. CRPS can present with distinct vasomotor phenotypes, including a "warm" subtype with vasodilation, erythema, and swelling, and a "cold" subtype with vasoconstriction, pallor or cyanosis, and trophic changes, reflecting variability in the underlying autonomic and vasomotor dysfunction across patients, matching this vignette's described clinical variability. CRPS does not present identically in every patient; recognized clinical variability, including the cold subtype, is well documented, making a claim of universal identical presentation incorrect. The cool, pale limb with reduced hair/nail growth described in this vignette is a recognized CRPS presentation (the cold subtype) rather than necessarily indicating an unrelated acute arterial occlusion, which would typically present with a much more acute, ischemic clinical picture.

183. A. Peripheral axonal regeneration is generally estimated to proceed at approximately 1 millimeter per day (roughly an inch per month), and this rate is commonly used to counsel patients on the expected timeline for functional recovery after axonotmesis, where the connective tissue scaffold remains intact to guide regenerating axons. Axonal regeneration is a gradual biological process occurring over weeks to months, not an instantaneous process completing within 24 hours, making this option factually incorrect. Peripheral axons (unlike central nervous system axons) do have meaningful capacity for regeneration when the surrounding connective tissue framework is preserved, as in axonotmesis, making a claim of no regeneration under any circumstances incorrect.

184. C. Diabetic autonomic neuropathy affects autonomic nerve fibers controlling cardiovascular (orthostatic hypotension, resting tachycardia), gastrointestinal (gastroparesis), and genitourinary (erectile dysfunction) function, representing a distinct category of diabetic neuropathy from the more commonly recognized somatic sensory involvement, matching this vignette's constellation of findings precisely. Distal symmetric sensorimotor polyneuropathy specifically affects somatic sensory and motor fibers, not the autonomic cardiovascular, GI, and genitourinary findings described in this vignette. Diabetic mononeuropathy affects a single isolated peripheral nerve (such as an isolated cranial nerve palsy), not the widespread, multi-system autonomic dysfunction pattern described in this vignette.

185. C. Pain assessment in patients with intellectual or developmental disabilities often requires adapted communication approaches, meaningful caregiver input on the patient's individual behavioral baseline, and greater reliance on behavioral observation tools rather than standard self-report scales alone, which is the correct, patient-centered approach illustrated in this vignette. This vignette explicitly describes the need for adapted, simplified communication rather than standard scale administration, directly contradicting a claim that standard numeric scales work equally well without adaptation in this population. Pain CAN be meaningfully assessed in this population using appropriately adapted tools and

approaches (as described in this vignette), making the claim that assessment is impossible and treatment should rely solely on diagnosis both inaccurate and a poor standard of care.

186. A. CYP2D6 poor metabolizers convert codeine to its active analgesic metabolite morphine much less efficiently than normal metabolizers, resulting in a reduced analgesic effect from standard codeine dosing, which is the correct pharmacogenomic explanation for this patient's poor response and the opposite phenomenon from the ultra-rapid metabolizer toxicity risk. Codeine itself has relatively weak intrinsic opioid activity and depends substantially on CYP2D6-mediated conversion to morphine for its analgesic effect, so claiming CYP2D6 status has no bearing on codeine's effect is incorrect. This option describes the ultra-rapid metabolizer phenotype (faster, more complete conversion producing increased effect and toxicity risk), which is the opposite of the poor metabolizer phenotype described in this vignette, making it factually backward.

187. B. Telemedicine can meaningfully improve access to chronic pain follow-up care for patients facing geographic or mobility barriers, while still requiring periodic in-person visits for physical examination and any needed procedural interventions that cannot be performed remotely, which is the correct, balanced characterization illustrated in this vignette. Telemedicine cannot fully replace all in-person components of chronic pain care; physical examination findings and procedural interventions genuinely require in-person visits, making a claim of complete replacement without limitation incorrect. This vignette explicitly illustrates a legitimate, beneficial role for telemedicine in improving access for this population, directly contradicting a claim that it has no legitimate role and should never be used.

188. C. Despite state-level legalization for medical or recreational use in many jurisdictions, cannabis remains a federally controlled substance, and physicians should engage patients in an informed discussion covering the variable and evolving evidence base for pain, inconsistent product quality and dosing across dispensary products, and potential interactions with other medications, which is the correct, nuanced consideration for this vignette. Cannabis has been legalized at the state level in numerous jurisdictions for medical and/or recreational use, directly contradicting a claim that this remains illegal in every state and making the described scenario impossible. Physicians should engage in open, informed discussion about cannabis use given the reality of its legal accessibility and patient use, rather than avoiding the conversation altogether, especially since meaningful safety and interaction considerations exist that patients benefit from discussing with their physician.

189. C. Qualified professional medical interpreters provide more accurate translation of complex medical terminology and help protect patient confidentiality and the integrity of informed consent, compared to ad hoc interpretation by family members who may lack medical vocabulary, introduce their own bias, or compromise confidentiality, which is the correct rationale for this practice. Family members translating medical information, however well-intentioned, risk inaccuracy and confidentiality concerns that professional interpreters are specifically trained to avoid, making a blanket preference for family interpretation over professional services inappropriate. Professional interpreter use is a patient-safety and quality-of-care standard, not merely an optional convenience with no meaningful impact, given the real risks of miscommunication and consent quality issues with informal translation.

190. B. Rural and geographically underserved populations frequently face significant access barriers to specialized pain care, including long travel distances and limited specialist availability, contributing to delayed diagnosis and treatment compared to patients with nearby urban specialty access, which is the accurate characterization illustrated in this vignette. This vignette explicitly describes a substantial access barrier (over three hours of travel) resulting in delayed care, directly contradicting a claim that geographic location has no meaningful effect on specialty access. Rural patients generally face WORSE, not better, access to specialty pain care due to fewer nearby specialists, directly contradicting a claim that rural patients consistently receive faster access than urban patients.

191. C. Long COVID-associated chronic pain is a recognized post-infectious syndrome presenting with persistent widespread pain, fatigue, and cognitive difficulties following COVID-19 infection, with features that overlap substantially with other central sensitization and chronic widespread pain conditions, representing an important and emerging area of clinical attention, matching this vignette's presentation and timeline precisely. This presentation is increasingly recognized as related to the preceding COVID-19 infection through post-infectious and central sensitization mechanisms, directly contradicting a claim that it is entirely coincidental and unrelated. Long COVID pain is not attributed to a specific, well-defined structural joint disease directly caused by the virus; it is better characterized as a functional, centrally-mediated post-infectious pain syndrome, making a structural joint disease characterization inaccurate.

192. B. Health literacy refers to a patient's ability to obtain, understand, and use health information to make appropriate decisions, and redesigning educational materials to use plain language and visual aids directly addresses variability in health literacy to support better patient comprehension and self-management, matching this vignette's redesign rationale precisely. This redesign is aimed at improving patient comprehension and outcomes, not at meeting a billing requirement, making a billing-focused explanation an inaccurate characterization of the described initiative. HIPAA governs the privacy and security of protected health information, an entirely separate regulatory domain from the clarity and readability of patient education materials described in this vignette.

193. B. Homelessness creates specific, practical barriers to chronic pain management, including medication adherence challenges, difficulty attending scheduled appointments, and safe storage concerns for controlled substances, which may require care plan adaptation and coordination with social support resources such as case management, matching this vignette's described considerations precisely. This vignette explicitly describes multiple concrete ways housing status affects treatment planning and adherence, directly contradicting a claim that housing status has no meaningful impact on chronic pain management. These barriers call for thoughtful care plan adaptation and support coordination, not exclusion from treatment altogether, making the exclusion option both clinically and ethically inappropriate.

194. A. Reviewing a patient's full current medication list, including gender-affirming hormone therapy, for clinically relevant drug interactions before prescribing a new pain medication is standard, appropriate practice, applying the same medication-reconciliation principle used for any patient's

chronic medication regimen, matching this vignette's described approach precisely. Like many chronic medications, gender-affirming hormone therapy can have relevant pharmacokinetic or pharmacodynamic considerations with certain other drugs, so a blanket claim of no interaction potential at all would be an inaccurate and clinically careless simplification. There is no blanket contraindication to prescribing pain medications to patients on gender-affirming hormone therapy; the appropriate approach is the same individualized interaction review used for any patient, not blanket exclusion from treatment.

195. C. When a patient has limited decision-making capacity, valid informed consent must be obtained from the legally authorized surrogate decision-maker, such as a court-appointed guardian, while still involving the patient in the discussion in an age/ability-appropriate way and seeking their assent where possible, matching this vignette's described process precisely. Informed consent requirements still fully apply in this scenario; they are simply directed to the legally authorized surrogate decision-maker rather than eliminated altogether, making a claim that consent requirements do not apply at all incorrect. A patient who has been determined to lack decision-making capacity and has a legally appointed guardian cannot independently provide legally valid consent through their own signature alone, making this option legally and clinically incorrect.

196. B. Systematically asking every patient about complementary and alternative medicine use at each visit supports complete medication reconciliation and helps identify potential interactions or safety concerns that might otherwise go unrecognized, which is exactly the practice and rationale described in this vignette. This information has genuine clinical relevance, since supplements and other CAM products can interact with prescribed medications or affect clinical decision-making, making a claim of no clinical relevance incorrect. This vignette explicitly describes ROUTINELY asking every patient at each visit, rather than waiting for unprompted volunteering, which is the entire point of a systematic disclosure practice rather than a passive, patient-initiated-only approach.

197. A. Structured pediatric-to-adult pain care transition planning, begun well in advance of the age cutoff and including treatment history summaries and introductory visits with the new provider, is aimed at ensuring continuity of care and reducing treatment gaps as a patient ages out of pediatric services, matching this vignette's described process and purpose precisely. This structured transition planning has genuine bearing on clinical continuity and outcomes, helping prevent gaps in treatment during a vulnerable transition period, making a claim of no clinical relevance incorrect. The entire point of this vignette is that transition planning begins well BEFORE the age cutoff, with structured coordination, directly contradicting a description of an abrupt, unplanned transfer occurring only on the birthday itself.

198. C. Financial toxicity, meaning cost-related barriers to obtaining or continuing treatment, can directly impair medication adherence and clinical outcomes, and physicians should proactively explore cost as a potential barrier and consider more affordable therapeutic alternatives when relevant, which is the correct, patient-centered response illustrated in this vignette. This vignette explicitly describes a cost-related barrier (inability to afford the copay) as the reason for skipped doses, not simple intentional non-adherence unrelated to any external factor, making that characterization inaccurate and dismissive

of a real barrier. This vignette explicitly demonstrates that cost DOES meaningfully influence adherence even with an existing prescription (the patient has a prescription but still cannot consistently afford it), directly contradicting a claim that cost has no meaningful influence in this context.

199. B. Post-bariatric surgical anatomy, including altered gastric volume, bypassed intestinal segments, and changes in gastric pH and transit time, can significantly and unpredictably alter the absorption of certain oral medications, including some extended-release formulations designed for absorption over a specific GI transit profile, matching this vignette's clinical concern precisely. This vignette explicitly describes a genuine, clinically important effect of bariatric surgical anatomy on oral drug absorption, directly contradicting a claim that bariatric surgery has no effect on oral medication absorption of any kind. Extended-release formulations are specifically a category of MORE concern, not less, in this population due to their dependence on a predictable, intact GI transit profile that bariatric surgery disrupts, making this option's claim backward.

200. A. Providing a certified ASL interpreter rather than relying on less reliable communication methods like written notes or lip-reading alone is an appropriate and often legally required communication accommodation for deaf and hard-of-hearing patients, supporting full participation, understanding, and valid informed consent, matching this vignette's described practice precisely. This accommodation has direct, meaningful bearing on the quality and validity of informed consent and overall care, since inadequate communication can lead to misunderstanding of the treatment plan, making a claim of no meaningful bearing incorrect. Clinics generally have a proactive obligation to provide effective communication accommodations for patients with hearing loss, rather than placing the burden entirely on the patient to explicitly request such accommodation, making this option an inaccurate characterization of accessibility standards.