

FACULTY OF PAIN MEDICINE
AUSTRALIAN AND NEW ZEALAND COLLEGE OF ANAESTHETISTS

FOUNDATIONS OF PAIN MEDICINE

SAMPLE MCQ EXAMINATION

50 MULTIPLE CHOICE QUESTIONS

INSTRUCTIONS

- The MCQ paper is provided to assist candidates in preparing for the Foundations of Pain Medicine examination.
- Note that in all cases the **ONE BEST ANSWER** is the response sought.
- The answers are not provided by the Faculty of Pain Medicine
- The Faculty of Pain Medicine will not enter into any discussion or considerations regarding individual questions.

The examination comprises 50 multiple choice questions to be completed in one hour.

Each of the questions or incomplete statements below is followed by 5 suggested answers or completions. Select the one that is **BEST** in each case and record your selection on the mark sheet.

1. A 72 year old man complains of numbness in his feet and difficulty walking. On examination he has normal pain and temperature sensation in his lower limbs, but decreased appreciation of light touch and proprioception.

Which of the following is the most likely site of a neurological lesion?

- a. Dorsal columns
 - b. Dorsal horn grey matter
 - c. Lateral corticospinal tracts
 - d. Lateral spinothalamic tracts
 - e. Spinocerebellar tracts
2. "Reductionism" is a philosophical position that holds the view that
- a. complex systems cannot be considered in terms of their constituent parts
 - b. complex systems can be adequately considered in terms of the sum of their constituent parts
 - c. psychologists focus too much on functional aspects of behaviour
 - d. there is too much research taking place in psychology
 - e. mental phenomena are, in some respects, non-physical, or that the mind and body are not identical
3. The use of placebo in clinical trials
- a. Allows distinction between true drug effects from the effects associated with the act of drug administration
 - b. Helps distinguish between pharmacokinetics and pharmacodynamics of a drug
 - c. Increases the chances of obtaining results in favour of a new drug by removing placebo reactors from the trial
 - d. Is extremely useful in determining the toxicity profile of a new drug
 - e. Is unethical in all human and animal research situations
4. 20mls of 0.5% bupivacaine is inadvertently injected into an epidural vein over 30 seconds. The patient is 45 years old and weighs 60kg. The most likely outcome would be
- a. Confusion and atrial ectopics
 - b. Focal seizures and torsades de pointes
 - c. Grand mal convulsion and hypotension
 - d. Muscle twitching and heart block
 - e. Tinnitus and sinus tachycardia

5. A drug has a hepatic extraction ration of 0.7 and is 30% absorbed from the gut. The bioavailability is therefore
- 0.09
 - 0.14
 - 0.21
 - 0.30
 - 0.70
6. The benzodiazepine with the longest elimination half-life is
- Diazepam
 - Flunitrazepam
 - Lorazepam
 - Midazolam
 - Temazepam
7. The most important modulators of neuronal excitability are
- Calcium channels
 - N-methyl-d-aspartate receptors
 - Potassium channels
 - Sodium channels
 - Transient vanilloid receptors
8. Compared with conventional non-steroidal anti-inflammatory drugs, selective COX-2 inhibitors
- Increase the risk of colorectal carcinoma
 - Produce a similar range of side effects
 - Produce similar rates of surgical bleeding
 - Reduce the incidence of gastrointestinal bleeding
 - Reduce the risk of myocardial infarction through selective inhibition of PGI₂
9. With regard to morphine
- Bioavailability of oral morphine exceeds 50% in normal subjects
 - Clinically significant metabolism occurs in the kidney
 - In adults it is predominantly metabolised to morphine-6-glucuronide
 - In infants metabolism is increased due to increased hepatic blood flow
 - The metabolite morphine-3-glucuronide is a potent mu-receptor agonist

10. The following arterial blood gas result is from a patient breathing room air who has been unwell for three days

pH 7.56
pCO₂ 46 mmHg
pO₂ 90 mmHg
HCO₃ 39 mEq.L⁻¹
B.E. +16.2 mEq.L⁻¹

These results can best be describes as

- a. Compensated secondary respiratory alkalosis
 - b. Mixed metabolic and respiratory alkalosis
 - c. Primary metabolic alkalosis with partial respiratory compensation
 - d. Primary respiratory acidosis with metabolic compensation
 - e. Uncompensated primary metabolic alkalosis
11. Paracetamol
- a. Has a toxic dose that is at least five times the maximum therapeutic dose
 - b. Has analgesic, antipyretic and strong anti-inflammatory actions
 - c. Is a strong inhibitor of the COX-2 isoenzyme, but not the COX-1 isoenzyme
 - d. Is commonly metabolised to the toxic product N-acetyl-p-benzoquinone imine which is rapidly inactivated by conjugation with glutathione
 - e. Is well absorbed by the stomach after oral administration because it is an acid and its pKa is 9.5
12. In statistical theory, the Central Limit Theorum states that
- a. A 95% confidence interval that includes zero is not statistically significant
 - b. If the number of observations is large, the distribution of sample means is approximately normally distributed
 - c. Random selection from a population will prevent confounding
 - d. The population mean is the best measure of central tendency
 - e. Two groups with the same mean and variance must be derived from the same population
13. In classical conditioning, when a neutral event or stimulus is repeatedly presented alongside a physiologically relevant stimulus, the latter is known as
- a. The conditioned response
 - b. The conditioned stimulus
 - c. The unconditioned stimulus
 - d. The unconditioned response
 - e. The placebo effect

14. A typical characteristic of serotonin syndrome is
- Encephalopathy
 - Hypocalcaemia
 - Hypothermia
 - Muscle flaccidity
 - QT interval prolongation
15. The time to the peak analgesic effect of an intravenous bolus of morphine is approximately
- 3-5 min.
 - 5-10 min.
 - 10-15 min.
 - 15-25 min.
 - 25-30 min.
16. According to receptor theory, a partial agonist
- Fails to produce a full maximal response due to decreased affinity to receptors
 - Is never used as a competitive antagonist
 - Never competitively inhibits the responses produced by full agonists
 - Produces a very similar response, at full receptor occupancy, to a full agonist
 - Produces concentration-effect curves that resemble those observed with full agonist in the presence of an irreversible antagonist
17. Codeine is
- A partial agonist that causes less of the serious opioid side effects of dependence and respiratory depression
 - Is manufactured commercially because it is not a naturally occurring opiate
 - Marked by racial homogeneity and limited inter-individual variability in the response
 - O-demethylated by CPY-2D6 enzyme to the active metabolite morphine
 - N-demethylated in the liver by CYP-3A1 enzyme to nor-codeine as the principal mechanism of action
18. The following can be extracted from the opium poppy
- Dihydrocodeine
 - Fentanyl
 - Heroin
 - Pethidine
 - Thebaine

19. The current International Association for the Study of Pain (IASP) definition of “neuropathic pain” is pain that is
- Caused by a lesion or disease of the somatosensory nervous system
 - Caused by a lesion or disease of the central somatosensory nervous system
 - Caused by a lesion or disease of the peripheral somatosensory nervous system
 - Defined by a specific clinical parameters in the presence of demonstrable damage to nerve tissue
 - Initiated by a primary lesion or dysfunction in the nervous system
20. Previous research suggests that the cultural differences found in laboratory based pain studies could be explained by
- Differences in the subject’s cultural context
 - Differences in the researchers cultural background
 - Differences in the length of pain duration
 - Differences in an individual’s work status
 - all of the above
21. The therapeutic index of a drug
- Can be derived from simple analysis of a graded dose-response curve
 - Is best expressed as the ratio of LD50 to ED50
 - Is easy to establish accurately from most drugs in humans
 - Is very helpful as a measure of the clinical usefulness of a drug
 - Takes into account the idiosyncratic nature of toxic reactions
22. The 4 muscles that constitute the shoulder rotator cuff include all of the following **EXCEPT**:
- Infraspinatus
 - Subscapularis
 - Supraspinatus
 - Teres major
 - Teres minor
23. The phenomenon of referred pain is caused by
- Convergence of inputs to dorsal horn cells.
 - Displacement of sensory inputs from internal organs
 - Divergence of outputs from dorsal horn cells.
 - Stretching of the skin surface during development.
 - Viscerospecific cells in the dorsal horn.

24. In a clinical trial, 3 out of 10 patients develop a complication in the control group, and 1 out of 10 patients develops the same complication in the treated group. To assess whether this is a statistically significant difference, the most appropriate statistical test to use would be
- a. Chi-squared test
 - b. Chi-squared test with Yates correction
 - c. Fisher's exact test
 - d. Mann-Whitney test
 - e. Student's t-test

25. When a new diagnostic test is evaluated in a group of subjects in whom the diagnosis is known, the following results are obtained

	Disease known to be present	Disease known to be absent
New test result positive	2	4
New test result negative	6	8

The specificity of the new test is closest to

- a. 25%
 - b. 33%
 - c. 57%
 - d. 67%
 - e. 75%
26. Which of the following receptors is stimulated by a substance known as capsaicin?
- a. Golgi tendon organs
 - b. Meissner's corpuscles
 - c. NMDA receptors
 - d. Pacinian corpuscles
 - e. TRPV1 receptors
27. The segment of the spinal cord that gives rise to axons of neurons that innervate the dermatome of the thumb is
- a. C5
 - b. C6
 - c. C7
 - d. C8
 - e. T1

- 28.** Which of the following predisposes to the nocebo effect?
- a. Aversive conditioning
 - b. Co-existent emotional disturbance
 - c. Expectation of adverse effects at the start of treatment
 - d. Premorbid emotional disturbances
 - e. All of the above
- 29.** Drug tolerance occurs when
- a. A drug produces more of an effect than it did previously
 - b. Decreased sensitivity to a substance develops as a result of its continuous use
 - c. It requires a smaller dose to repeat the initial drug effect
 - d. Large amounts of drug are administered regularly
 - e. The sensitivity of cAMP is reduced in response to the drug
- 30.** In bioethics, action that is done for the benefit of others is
- a. Beneficence
 - b. Benevolence
 - c. Non-maleficence
 - d. Supererogatory
 - e. Utilitarian
- 31.** Transduction is
- a. Is the production of electrical signals at the pain nerve endings
 - b. Is caused by the activation of mechanoreceptors
 - c. The method by which silent nociceptors are activated by stimuli
 - d. The process by which a nociceptor converts noxious signals to nociceptive impulses
 - e. The conveyance of energy from peripheral receptors to the spinal cord
- 32.** Wallerian degeneration is the degeneration of the axon and myelin sheath due to
- a. lack of nutrients proximal to the injury site
 - b. repeated stimulation
 - c. supra-threshold stimulation
 - d. the lack of nutrients distal to the injury site
 - e. the presence of toxins

- 33.** The descending pathway for central control of nociception includes fibres from
- the periaqueductal grey that synapse directly on dorsal horn cells
 - the periaqueductal grey that synapse on neurons of the nucleus raphe magnus then dorsal horn cells
 - the periaqueductal grey that synapse on inferior olivary neurons then dorsal horn cells
 - Hypothalamus that synapse upon neurons of the nucleus solitaries then dorsal horn cells
 - Hypothalamus that synapse directly on dorsal horn neurons
- 34.** The most commonly used system in Australia and New Zealand designed to aid formulating a diagnosis for persons presenting with mental illness is
- Australian Psychiatric Association Classification of Mental Disorders
 - Diagnostic and Statistical Manual of Mental Disorders
 - International Classification of Diseases
 - Psychodynamic Diagnostic Manual
 - World Health Organization Classification of Psychiatric Diseases
- 35.** Within a mental state examination, speech is described in terms of
- Quality , rate, volume and tone
 - Rate and quality
 - Quality and volume
 - Rate, volume and tone
 - Volume and tone
- 36.** In a patient with chronic low back pain, immobility and depression are risk factors often described as
- Blue flags
 - Black flags
 - Green flags
 - Red flags
 - Yellow flags
- 37.** The lobar collapse most easily missed on physical examination is
- Left upper lobe
 - Left lower lobe
 - Right lower lobe
 - Right middle lobe
 - Right upper lobe

38. Disability in people with persisting pain can be related to
- Attention by solicitous relatives
 - Environmental demands
 - The duration of the noxious stimulus
 - The severity of the precipitating trauma
 - Threat appraisal

39. Metabolic acidosis with a normal anion gap can occur in
- Chronic renal failure
 - Diabetic keto-acidosis
 - Ethylene glycol poisoning
 - Renal tubular acidosis
 - Salicylate poisoning

40. This ECG tracing was obtained from a 78 year old woman being treated for hypertension.



It most likely represents

- First degree heart block
 - Hypercalcaemia
 - Hypokalaemia
 - Mobitz type II block
 - Wolff-Parkinson-White (WPW) syndrome
41. In the hand the ulnar nerve supplies
- Adductor digiti minimi
 - Abductor pollicis brevis
 - Adductor pollicis
 - Palmaris longus
 - The lumbrical muscles
42. The parasympathetic division of the autonomic nervous system consists of cell bodies located in
- Cervical paravertebral ganglia
 - Chromaffin cells of the adrenal medulla
 - Rostral lumbar ganglia
 - Mesenteric ganglia
 - The brainstem

- 43.** The study of single genetic variations and their role in determining individual responses to a drug is known as
- Monogenomics
 - Pharmacogenetics
 - Pharmacogenomics
 - Single gene phenotypic variation
 - Sequence polymorphism consequences
- 44.** Cytochrome 2D6 is commonly involved in the metabolism of
- Haloperidol to an active metabolite causing tardive dyskinesia
 - Codeine to norcodeine which produces some analgesic effect
 - Imipramine with 180% efficacy for ultra-rapid metabolisers
 - Fluoxetine to an inactive metabolite in extensive metabolisers
 - Morphine conjugation to the 3- and 6-glucuronides
- 45.** Compared with visceral pain, somatic pain is generally characterised by
- A diagnosable disease causing the pain
 - Activation of a dedicated sensory nervous system
 - Greater pain intensity because the nerves supply skin and deep tissues
 - Musculoskeletal origins that can be identified easily
 - Nociceptors sending impulses to the spinal cord
- 46.** Cartesian dualism is the philosophical examination of the difference between
- Consciousness and the brain
 - Physicalism and idealism
 - Reality and consciousness
 - Structuralism and materialism
 - Substance and property
- 47.** Compared with pain, nociception refers to
- Central nervous system processing of information from the external environment
 - Peripheral and central nervous system processing of information generated by nociceptor activation
 - Peripheral nervous system processing of information from activated nociceptors
 - The activation of unmyelinated C-fibres and thinly myelinated A-delta fibres
 - The response to noxious stimuli activating peripheral nociceptors

- 48.** To be considered chronic, pain has to persist for more than
- a. one to three months
 - b. two to four months
 - c. three to six months
 - d. six to nine months
 - e. six to twelve months
- 49.** Evidence that suggests biological models of pain do not explain all types of pain includes Level 1 evidence from research in
- a. Child development
 - b. Cognitive behaviour therapy
 - c. Placebo responses to analgesics
 - d. Social systems analysis
 - e. The diagnosis of psychiatric disorders
- 50.** A painful syndrome characterised by an abnormally painful reaction to a stimulus, especially a repetitive stimulus, as well as an increased threshold is known as
- a. Anaesthesia dolorosa
 - b. Hyperaesthesia
 - c. Hyperalgesia
 - d. Hyperpathia
 - e. Neuropathic pain