

USMLE-STEP-1^{Q&As}

United States Medical Licensing Step 1

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QUESTION 1

Hormone-secreting chromophils in the pars distalis of the adenohypophysis are classified into acidophils and basophils. Which of the following hormones is secreted by the acidophils?

- A. adrenocorticotropin
- B. follicle-stimulating hormone
- C. luteinizing hormone
- D. prolactin
- E. thryrotropin (thyroid-stimulating hormone)

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Correct Answer: D
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Section: Anatomy Prolactin is secreted by one of the two types of hormone-secreting acidophils, the mammotrophs. The other types of acidophils are the somatotrophs, which secrete growth hormone (somatotropin). The hormones listed in all the other choices are secreted by the basophils. Adrenocorticotropin (choice A) is secreted by the corticotrophs. The gonadotrophs secrete either follicle-stimulating hormone (choice B) or luteinizing hormone (choice C). Thyrotropin (choice E) is secreted by thyrotrophs.

QUESTION 2

A 71-year-old woman suffers severe head injuries in a mugging and is hospitalized in a comatose state. While in the hospital, she develops severe pneumonia and on day 11 goes into cardiac arrest and cannot be resuscitated. At autopsy she is found to have advanced coronary atherosclerosis and a pulmonary embolism judged to have occurred within the past 23 days. The coroner should list which of the following on the death certificate as the underlying (or proximate) cause of death?

- A. atherosclerosis
- B. blunt trauma to the head GI
- C. cardiopulmonary arrest
- D. pneumonia
- E. pulmonary embolism

Correct Answer: B

Section: Pathology and Path physiology The proximate or underlying cause of death is the initiating event that led to the person\\'s death and is what should be listed on the death certificate as the cause of death. In this case, if the woman had not been struck on the head she would not have been hospitalized, not contracted a nosocomial pneumonia (choice D), not had a pulmonary embolism due to the prolonged immobilization (choice E), and not had a cardiopulmonary arrest (choice C). Atherosclerosis (choice A) must have been present for many years prior to the mugging and had no role in her death.

QUESTION 3



The table below provides several possible descriptions of the actions of nondepolarizing neuromuscular blockers such as tubocurarine. Which description is most accurate?

Choice	Effect of Tetanic Stimulation	Posttetanic Potentiation	Reversal by Neostigmine
A	Fade	No	No
B	Constant	Yes	No
C	Fade	No	Yes
D	Fade	Yes	Yes
E	Constant	Yes	Yes

- A. Option A
- B. Option B
- C. Option C
- D. Option D
- E. Option E
- Correct Answer: D

Section: Pharmacology Nondepolarizing neuromuscular blockers are heavily used in anesthesia because they produce full surgical relaxation without causing significant cardiovascular depression. They act as nicotinic cholinoceptor blockers at the neuromuscular nicotinic receptor, with little or no ganglionic blockade. They have some effect on presynaptic cholinoceptors of motor nerves and it is believed that this site of action is the cause of alterations in the response of the motor nervemuscle system to rapid stimulation. A train of four stimulations, a form of titanic stimulation, is used by anesthesiologists to monitor the level of neuromuscular block in the anesthetized patient and consists of a brief period of stimulation. In the absence of drugs, as well as in the presence of a depolarizing blocker, the twitches during train of four are well maintained in strength. However, after a nondepolarizing blocker the contraction strength fades during the sequence (choices A, C, or D). In the absence of drugs, rapid tetanic stimulation results in moderate increase in contraction during the tetanus and a marked increase in strength of the muscle twitch following the end of the train due, at least in part, to a buildup of calcium in the motor nerve terminal. This posttetanic potentiation is enhanced by nondepolarizing blockers (choices B, D, or E). Finally, nondepolarizing blockade results from competitive blockade of cholinoceptors, so increasing the amount of acetylcholine in the synapse by means of a drug like neostigmine can reverse the blockade (choices C, D, or E). Thus, only choice D meets all three requirements.

QUESTION 4

A 19-year-old man was in a barroom brawl and was punched squarely in the right eye. He comes to the emergency room the next day and complains of diplopia. An X-ray reveals fracture of the orbital floor. Neurological examination shows loss of sensation of the skin of the right face below the right eye and the upper gums. Which of the following nerves may be injured?

- A. frontal nerve
- B. infraorbital nerve
- C. nasociliary nerve
- D. supraorbital nerve



E. trochlear nerve

Correct Answer: B

Section: Anatomy The infraorbital nerve, a branch of the maxillary (V2) division of the trigeminal (fifth cranial) nerve, courses below the orbital floor to reach the area of skin below the eye. It provides superior alveolar branches to supply the upper gums and is vulnerable in fractures involving the floor of the orbit and face area. All the nerves mentioned in the other choices will be spared by this type of injury. The frontal nerve (choice A) and nasociliary nerve (choice C) are branches from the ophthalmic division (V1) of the trigeminal (fifth cranial) nerve and course within the orbit. The supraorbital (choice D) nerve is a continuation branch of the frontal nerve onto the forehead, providing sensory innervation for this area. The trochlear (fourth cranial) nerve is also located within the orbit.

QUESTION 5

Cell adhesion molecules enable intercellular contacts in epithelial as well as nonepithelial cells. Which of the following cell adhesion molecules are calcium-dependent molecules?

- A. disintegrins
- B. integrins
- C. intercellular adhesion molecules (I-CAM)
- D. neural cell adhesion molecules (N-CAM)
- E. selectins

Correct Answer: E

Section: Anatomy Cell adhesion molecules are divided into two major classes on the basis of their dependence on calcium. Calcium-dependent cell adhesion molecules are the cadherins and the selectins. Calcium- independent cell adhesion molecules include members of the immunoglobulin superfamily, the I-CAM (choice C), and the N- CAM, as well as the integrins (choice B). Disintegrins (choice A) are found in snake venom and disrupt the integrin-mediated cell binding to extracellular matrix proteins such as laminin or fibronectin.

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