NBE Science Practice Test (Sample)

Study Guide

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Questions

1. **Which of the following methods consists of injecting a few ounces of arterial chemical, then draining for a few minutes, each one separately?**

   A. Continuous drainage

   B. Alternative method

   C. Concurrent injection

   D. Intermittent injection

2. **A creamy, white, odorless purge from the nostrils is most probably from which organ?**

   A. Liver

   B. Heart

   C. Brain

   D. Lungs

3. **What genus of microorganism is known to cause diseases like ornithosis and trachoma?**

   A. Escherichia

   B. Chlamydia

   C. Staphylococcus

   D. Salmonella

4. **What term describes the invasion of the body by a pathogenic agent that multiplies and produces injurious effects?**

   A. Infection

   B. Inflammation

   C. Contamination

   D. Inoculation

5. **What condition occurs when blood flow to an area of tissue is reduced, resulting in decreased oxygen supply?**

   A. Ischemia

   B. Hyperemia

   C. Necrosis

   D. Cyanosis

6. What is a final and positive sign of death?

A. Rigor mortis

B. Generalized decomposition

C. Pallor mortis

D. Livor mortis

7. Which of the following has a direct connection to the cerebral arterial circle?

A. Posterior cerebral

B. Common carotid

C. Internal carotid

D. Vertebral

8. Which type of arterial tube connection allows for a quick connection?

A. Quick connect

B. Threaded

C. Slip-type

D. Luer-lok

9. Which of the following best describes the growth pattern of neoplasms?

A. Random and sporadic

B. Grows by infiltration

C. Uniformly in a spherical shape

D. Only at designated sites

10. What is the value of a three-quarter view photograph in restorative art?

A. Shows the depth of facial wrinkles

B. Reveals the degree of fullness of the cheeks

C. Highlights skin texture variations

D. Displays hair color accurately

Answers

1. B
2. C
3. B
4. A
5. A
6. B
7. A
8. A
9. B
10. B

Explanations

1. Which of the following methods consists of injecting a few ounces of arterial chemical, then draining for a few minutes, each one separately?

A. Continuous drainage

B. Alternative method

C. Concurrent injection

D. Intermittent injection

The method described in the question involves a technique where a certain amount of arterial chemical is injected into the body, followed by a separate phase of drainage for a few minutes. This approach allows for the chemical to be distributed effectively throughout the vascular system before fluid is removed, and it is typically employed to ensure that the tissues receive the desired embalming solution while allowing for the removal of blood and other fluids. This method is known as the alternative method of injection and drainage. It is distinctive because it varies from traditional concurrent or continuous methods by separating the injection and drainage phases, allowing for a precise control over fluid distribution and elimination. This technique can be particularly useful in complex cases or when specific anatomical areas require particular attention. In contrast, continuous drainage involves simultaneous injection and drainage. Concurrent injection refers to the simultaneous process of injecting fluid while also draining, with no pause. Intermittent injection typically involves a pattern where fluid is injected in a stop-and-start manner, but again does not separate injection and drainage in the distinct phases described in the question. Thus, the alternative method is the correct choice as it accurately describes the process of first injecting the chemical and then conducting a separate drainage period.

2. A creamy, white, odorless purge from the nostrils is most probably from which organ?

A. Liver

B. Heart

C. Brain

D. Lungs

The creamy, white, odorless purge from the nostrils is likely associated with the brain, particularly in the context of conditions such as cerebral fluid leakage through the nasal passages. When there is a breach in the protective barriers separating the brain from the nasal cavity, such as with certain types of head trauma or surgery, a clear fluid resembling cerebrospinal fluid (CSF) may escape through the nose. While the appearance described is specifically creamy and white, this could be indicative of a combination of CSF and other components, including mucus, which can occur as the body's response to an injury or condition affecting the central nervous system. In contrast, the liver, heart, and lungs do not directly produce or expel secretions that would manifest as a creamy, white, odorless fluid from the nostrils. The liver is primarily involved in metabolic processes and produces bile, while the heart pumps blood and does not release purulent fluids in this manner. The lungs are associated with respiratory secretions, such as mucus or phlegm, which typically have distinct characteristics that differ from what is described in the question. Thus, the brain is the most logical organ associated with this symptom, emphasizing the connection between neurological issues and nasal discharges.

3. What genus of microorganism is known to cause diseases like ornithosis and trachoma?

A. Escherichia

B. Chlamydia

C. Staphylococcus

D. Salmonella

Chlamydia is the correct answer because it is a genus of bacteria that is well-known for being the causative agent of a variety of diseases in humans and animals. Ornithosis, also known as psittacosis, is an infection that can be transmitted from birds to humans, often linked to the Chlamydia psittaci species. Additionally, trachoma, which is a significant cause of blindness in some parts of the world, is caused by Chlamydia trachomatis. This genus is unique in that it includes obligate intracellular pathogens, meaning they must live within host cells to replicate. The ability of Chlamydia to survive and multiply inside host cells contributes to the diseases they cause, and their specific transmission pathways result in distinct clinical manifestations. Understanding these aspects helps to clarify the role of Chlamydia in public health and epidemiology.

4. What term describes the invasion of the body by a pathogenic agent that multiplies and produces injurious effects?

A. Infection

B. Inflammation

C. Contamination

D. Inoculation

The term that best describes the invasion of the body by a pathogenic agent that multiplies and produces injurious effects is Infection. Infections occur when microorganisms, such as bacteria, viruses, fungi, or parasites, enter the body, multiply, and cause harm to the host. The process can lead to various symptoms and immune responses as the body attempts to fight off the invaders. In contrast, inflammation refers to the body's response to infection or injury, characterized by redness, heat, swelling, and pain, but it does not encompass the direct invasion or multiplication of pathogens itself. Contamination refers to the presence of an unwanted substance in a sterile environment, which may not necessarily involve active multiplication of pathogens. Inoculation typically means introducing a pathogen into a host to stimulate an immune response, rather than a natural invasion that results in symptoms. Thus, while all these terms relate to disease processes, infection specifically signifies the condition where pathogenic agents invade and replicate in the body, leading to harmful effects.

5. What condition occurs when blood flow to an area of tissue is reduced, resulting in decreased oxygen supply?

A. Ischemia

B. Hyperemia

C. Necrosis

D. Cyanosis

Ischemia is the condition that arises when blood flow to a specific area of tissue is insufficient, leading to a decreased supply of oxygen and nutrients essential for the tissue's functioning. When blood circulation is disrupted, it can result from various factors such as blood vessel blockage, reduced blood pressure, or vasoconstriction. The lack of adequate oxygen (hypoxia) due to ischemia can cause tissue damage over time, potentially leading to further complications such as necrosis if not resolved. Understanding ischemia is vital in the context of various medical conditions, including heart disease, stroke, and peripheral artery disease, where the affected tissues or organs suffer from low oxygen levels, resulting in functional impairment or death of cells if the condition persists. In contrast, the other options presented involve different mechanisms or phenomena, such as increased blood flow or changes in color due to other related issues, differentiating them from the specific nature of ischemia.

6. What is a final and positive sign of death?

A. Rigor mortis

B. Generalized decomposition

C. Pallor mortis

D. Livor mortis

The final and positive sign of death is generalized decomposition. This stage indicates that the body has begun to break down significantly after death, a process influenced by various factors such as temperature, humidity, and the environment. Decomposition leads to the breakdown of tissues and organs, culminating in the total disintegration of the body's structures. Once a body has reached this advanced stage of decomposition, it is unequivocally clear that death has occurred. It is essential to note the other signs of death, such as rigor mortis, which refers to the stiffening of the muscles after death, and livor mortis, the pooling of blood due to gravity after the heart has stopped beating, both of which can occur within hours of death and may not indicate finality. Pallor mortis, the paleness that occurs shortly after death due to the cessation of blood circulation, is also an early post-mortem change. These earlier signs indicate death has occurred but do not represent the irreversible and comprehensive nature of generalized decomposition.

7. Which of the following has a direct connection to the cerebral arterial circle?

A. Posterior cerebral

B. Common carotid

C. Internal carotid

D. Vertebral

The posterior cerebral artery has a direct connection to the cerebral arterial circle, also known as the circle of Willis. This circular network of arteries at the base of the brain facilitates collateral blood flow between the different vascular territories, helping to ensure a consistent blood supply to the brain even if one vessel becomes narrowed or blocked. The posterior cerebral artery arises from the basilar artery and feeds blood to the occipital lobes and the bottom parts of the temporal lobes. It is one of the key arteries that branches off from the circle of Willis. The common carotid artery, while important in supplying blood to the head and neck, branches into the internal carotid and external carotid arteries, but it does not form part of the circle of Willis itself. The internal carotid artery does contribute to the circle by supplying blood to various other arteries within it, but it does not directly connect in the same manner as the posterior cerebral artery. The vertebral arteries combine to form the basilar artery and also play a role in supplying blood to the posterior circulation of the brain, but they do not have a direct connection to the circle. Thus, the posterior cerebral artery is correctly identified as having a direct connection to the circle of Willis because it stems directly

8. Which type of arterial tube connection allows for a quick connection?

A. Quick connect

B. Threaded

C. Slip-type

D. Luer-lok

A quick connect connection is designed specifically for ease and speed of use, allowing for the rapid coupling and uncoupling of two components without the need for tools or extensive manipulation. This type of connection typically features a mechanism that securely locks the connection in place simply by pushing or pulling the two parts together or apart. This is particularly advantageous in medical and emergency settings where time is critical, enabling healthcare professionals to establish arterial connections swiftly and efficiently. In contrast, a threaded connection requires the components to be twisted together which can take more time and may not be ideal in situations requiring immediate access. The slip-type connection, while potentially quick to engage, may not provide the same level of secure engagement as a quick connect, possibly leading to issues if there's any movement. The Luer-lok connection, though it offers a secure fit due to its locking mechanism, still relies on threading to secure the joint, making it less expedient than a quick connect. Thus, the quick connect system stands out for its ability to facilitate rapid connections, which is a critical requirement in various applications, particularly in medical scenarios.

9. Which of the following best describes the growth pattern of neoplasms?

A. Random and sporadic

B. Grows by infiltration

C. Uniformly in a spherical shape

D. Only at designated sites

The growth pattern of neoplasms is best described as growing by infiltration. Neoplasms, which can be benign or malignant tumors, often invade surrounding tissues as they expand. This ability to infiltrate adjacent normal tissue is a characteristic feature of malignant neoplasms (cancers) and is significant because it can make complete surgical removal difficult. The infiltrative growth pattern contributes to the potential for metastasis, where cancer cells spread to other parts of the body. The other options do not accurately capture the nature of neoplastic growth. While some neoplasms may exhibit random patterns at times, such behavior is not representative of the general growth characteristic associated with neoplasms. Additionally, neoplasms do not typically adopt a uniform spherical shape; their growth can be irregular and varied depending on the tissue type and the biological behavior of the tumor. The idea that neoplasms only grow at designated sites is also misleading, as their infiltrative nature means they can spread beyond their original location, affecting various tissues.

10. What is the value of a three-quarter view photograph in restorative art?

A. Shows the depth of facial wrinkles

B. Reveals the degree of fullness of the cheeks

C. Highlights skin texture variations

D. Displays hair color accurately

A three-quarter view photograph is valuable in restorative art primarily because it reveals the degree of fullness of the cheeks. This angle effectively captures the three-dimensional aspects of the face, allowing an artist or technician to assess how fullness contributes to the overall contour and shape of the face. In restorative art, understanding the fullness of the cheeks is essential for recreating lifelike appearances in deceased individuals. This fullness can significantly affect the perceived age and health of a person, making it a crucial aspect in achieving a natural and respectful restoration. Evaluating the cheeks from this angle provides insight into the underlying structure and how skin lays over it, which is paramount for accurate restoration work. The other options, while acknowledging various factors of facial appearance, do not emphasize the three-quarter perspective's unique capability to indicate cheek fullness. For example, facial wrinkles and skin texture are also important but may be more prominent from different angles or less relevant to the restoration process than the fullness of the cheeks. Similarly, hair color is not directly impacted by facial structure and is observable from a more straightforward view. Thus, the three-quarter view uniquely serves to assess the fullness of facial features, making it an essential tool in restorative art.