Anesthesia Technologist Practice Exam (Sample)

Study Guide

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Questions

1. Which muscle relaxant should be avoided in patients diagnosed with atypical plasma cholinesterase?

A. Vecuronium

B. Succinylcholine

C. Rocuronium

D. Atracurium

2. A Quincke needle is designed to be sharp and is likely to cause what risk to the provider?

A. Minimal risk of injury

B. Burn injury

C. Needle stick injury

D. Allergic reaction

3. What is the action of the drug heparin in the context of anesthesia?

A. Induces anesthesia

B. Inhibits platelet function

C. Reverses anesthesia

D. Promotes sedation

4. What defines autologous blood?

A. Blood that is collected from a healthy donor

B. Blood that a patient donates for their own use

C. Blood that is used in emergency transfusions

D. Blood that is mixed from several donors

5. At what mark should the balloon on the PAC be inflated?

A. 10 cm

B. 15 cm

C. 20 cm

D. 25 cm

6. What is the normal trip point to generate the wash cycle in an autotransfusion device's fill mode?

A. At the bottom of the bowl

B. Half an inch above the bowl

C. A quarter inch above the shoulder of the bowl

D. At the level of the cardiotomy reservoir

7. What role does a blood pressure cuff play in anesthesia monitoring?

A. To administer medications

B. To monitor the patient's heart rhythm

C. To assess the patient's blood pressure for stability

D. To deliver fluids to the patient

8. What is the impact of a trapped air bubble on the Pvo2 measurement in a mixed venous blood sample?

A. Increase

B. Decrease

C. No effect

D. Variable

9. What is the primary purpose of a double lumen tube in anesthesia practice?

A. To allow for dual ventilation

B. To facilitate easier intubation

C. To monitor blood pressure

D. To administer anesthetic agents

10. How much sterile, non-bacteriostatic water is required to mix with a 20mg vial of Dantrolene?

A. 30 cc's

B. 40 cc's

C. 50 cc's

D. 60 cc's

Answers

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

Explanations

1. Which muscle relaxant should be avoided in patients diagnosed with atypical plasma cholinesterase?

A. Vecuronium

B. Succinylcholine

C. Rocuronium

D. Atracurium

Succinylcholine should be avoided in patients diagnosed with atypical plasma cholinesterase due to its unique metabolism. Succinylcholine is a depolarizing neuromuscular blocker that is rapidly broken down in the body by plasma cholinesterase into inactive metabolites. In patients with atypical plasma cholinesterase, there is a genetic variant of the enzyme that leads to a slower metabolism of succinylcholine. Consequently, this can result in prolonged neuromuscular blockade, causing significant complications such as respiratory failure and prolonged paralysis. Understanding the metabolism of neuromuscular blocking agents is crucial in safely managing anesthesia. In contrast, other muscle relaxants such as vecuronium, rocuronium, and atracurium do not rely on plasma cholinesterase for their breakdown. Vecuronium and rocuronium are primarily eliminated by the liver and kidneys, while atracurium undergoes a mechanism of spontaneous degradation and ester hydrolysis that is less affected by cholinesterase activity. Therefore, they do not pose the same risk for prolonged effects in patients with atypical plasma cholinesterase.

2. A Quincke needle is designed to be sharp and is likely to cause what risk to the provider?

A. Minimal risk of injury

B. Burn injury

C. Needle stick injury

D. Allergic reaction

The Quincke needle is a specialized type of spinal needle that is indeed designed to be sharp, which enhances its ability to penetrate tissue effectively. This design, while beneficial for medical procedures such as spinal taps or epidurals, also inherently increases the risk of a needle stick injury to the provider. Needle stick injuries can occur if the provider inadvertently pricks themselves with the needle during handling, particularly in situations where dexterity is required or when manipulating the needle near sensitive areas. In clinical practice, providers are always cautioned about the potential for needle stick injuries, as these incidents can lead to serious complications, including transmission of bloodborne pathogens. Therefore, understanding that a sharp needle like the Quincke needle presents a clear and identifiable risk highlights the importance of safety protocols when using such instruments in a clinical setting. While minimal risk of injury could be perceived as a consideration, it does not accurately reflect the accepted safety concerns surrounding sharp needles. Burn injuries are associated with other types of equipment, and allergic reactions typically arise from materials or medications rather than needle interactions. Thus, recognizing the specific risk associated with the sharp design of the Quincke needle directly points to the likelihood of needle stick injuries, affirming the reasoning behind the correct choice.

3. What is the action of the drug heparin in the context of anesthesia?

A. Induces anesthesia

B. Inhibits platelet function

C. Reverses anesthesia

D. Promotes sedation

Heparin plays a crucial role in clinical practice, particularly in the context of anesthesia, by functioning as an anticoagulant. Its primary action is to inhibit platelet function, which helps to prevent the formation of blood clots. This is particularly important during surgical procedures where the risk of thrombosis increases due to immobility and vascular injury. By inhibiting platelet aggregation and the clotting cascade, heparin reduces the potential for clot-related complications, thereby providing a safer environment for surgeries and interventions. This mechanism is essential during anesthesia as it allows for better management of blood flow and reduces the risk of perioperative complications related to thrombosis. Other choices do not resonate with the pharmacological actions of heparin; it does not induce or reverse anesthesia, nor does it promote sedation. Instead, its primary role firmly aligns with the inhibition of platelet function, making it a valuable agent in ensuring patient safety during anesthetic management.

4. What defines autologous blood?

A. Blood that is collected from a healthy donor

B. Blood that a patient donates for their own use

C. Blood that is used in emergency transfusions

D. Blood that is mixed from several donors

Autologous blood specifically refers to blood that is collected from a patient for their own use, typically scheduled for a future surgical procedure where they may require a transfusion. This practice minimizes the risk of transfusion reactions or disease transmission since the blood is from the same individual. Autologous donation is often encouraged in patients who are expected to lose a significant amount of blood during surgery, allowing for a direct match with their own blood. The other options do not accurately represent the definition of autologous blood. Blood collected from a healthy donor pertains to allogenic blood, which is intended for use by patients other than the donor. Emergency transfusions usually involve typed blood from a blood bank, not specifically collected for the recipient, and blood that is mixed from several donors refers to pooled or cross-donated blood, not autologous. Thus, the definition of autologous blood remains distinct and focused on self-donation for personal use.

5. At what mark should the balloon on the PAC be inflated?

A. 10 cm

B. 15 cm

C. 20 cm

D. 25 cm

In the context of pulmonary artery catheters (PAC), the balloon should be inflated at the mark that corresponds to the correct placement of the catheter within the heart and pulmonary arteries. The typical inflation mark is around 20 cm from the fluoroscopic marker for the right atrial or right ventricular position. This distance ensures that the catheter is placed properly while minimizing the risk of complications such as balloon rupture or incorrect positioning. Selecting the 20 cm mark aligns with established best practices in clinical settings, allowing healthcare professionals to accurately assess cardiac function and hemodynamics through the measurements taken from the PAC.

6. What is the normal trip point to generate the wash cycle in an autotransfusion device's fill mode?

A. At the bottom of the bowl

B. Half an inch above the bowl

C. A quarter inch above the shoulder of the bowl

D. At the level of the cardiotomy reservoir

The normal trip point to generate the wash cycle in an autotransfusion device's fill mode is established as a quarter inch above the shoulder of the bowl. This specific height is critical because it ensures that the bowl has sufficient volume of processed blood to begin the washing process without risk of over-filling or under-filling, which could compromise the efficiency of the autotransfusion. When the fill mode is activated, the autotransfusion device utilizes this trip point to monitor the filling level accurately. It signifies the optimal point where the wash cycle should initiate to effectively remove any unwanted components or debris from the collected blood, thereby enhancing the quality of the reinfused blood for the patient. Establishing the trip point too low, such as at the bottom of the bowl, could lead to unnecessary activations of the wash cycle before adequate volume is available, whereas positioning it at half an inch above the bowl may not align with optimal performance criteria set by the device's design. The cardiotomy reservoir level, while relevant in a different context of blood collection and management, does not serve as the effective trip point for initiating the wash cycle in the fill mode of the autotransfusion device.

7. What role does a blood pressure cuff play in anesthesia monitoring?

A. To administer medications

B. To monitor the patient's heart rhythm

C. To assess the patient's blood pressure for stability

D. To deliver fluids to the patient

The role of a blood pressure cuff in anesthesia monitoring is primarily to assess the patient's blood pressure for stability. During anesthesia, it is crucial to continuously monitor hemodynamic parameters, including blood pressure, to ensure the patient's safety and response to the anesthetic agents. The blood pressure cuff provides vital information about the cardiovascular system, allowing the anesthesia team to detect hypotension or hypertension, which can indicate potential complications during surgery. Monitoring blood pressure helps in guiding fluid management, medication administration, and adjusting anesthesia depth. By evaluating blood pressure trends, the anesthesia provider can make informed decisions to maintain hemodynamic stability throughout the procedure. This is essential for minimizing risks and ensuring the patient's overall well-being while under anesthesia.

8. What is the impact of a trapped air bubble on the Pvo2 measurement in a mixed venous blood sample?

A. Increase

B. Decrease

C. No effect

D. Variable

A trapped air bubble in a mixed venous blood sample can lead to an increase in the partial pressure of oxygen (Pvo2) measurement. This occurs because the air bubble introduces additional oxygen into the sample that wasn't present in the venous blood. Since mixed venous blood is expected to have lower oxygen levels due to the deoxygenation process occurring during circulation, the presence of a bubble can artificially elevate the Pvo2 reading. This phenomenon underscores the importance of proper sampling technique in measuring blood gases. If a sample is contaminated with an air bubble, it can lead to misinterpretation of a patient's oxygenation status, potentially resulting in inappropriate clinical decisions. A thorough understanding of how various factors influence blood gas analysis is crucial for anesthesia technologists, as accurate monitoring of oxygen levels is vital for patient safety and effective anesthesia management.

9. What is the primary purpose of a double lumen tube in anesthesia practice?

A. To allow for dual ventilation

B. To facilitate easier intubation

C. To monitor blood pressure

D. To administer anesthetic agents

The primary purpose of a double lumen tube in anesthesia practice is to allow for dual ventilation. This type of endotracheal tube is designed with two separate lumens that can be used to ventilate two different areas of the lungs or to manage both lungs independently, which is particularly useful in cases such as single-lung ventilation during procedures that require isolation of one lung, like thoracotomies. This capability enhances the anesthesiologist's control over ventilation and oxygenation in the patient, enabling more precise management of complex surgical situations. The other options highlight functions that are not the main purpose of a double lumen tube. While facilitating intubation, monitoring blood pressure, and administering anesthetic agents are all important aspects of anesthesia practice, they do not specifically relate to the unique features and intended use of a double lumen tube.

10. How much sterile, non-bacteriostatic water is required to mix with a 20mg vial of Dantrolene?

A. 30 cc's

B. 40 cc's

C. 50 cc's

D. 60 cc's

To determine the correct volume of sterile, non-bacteriostatic water required to mix with a 20 mg vial of Dantrolene, it is important to understand the manufacturer's recommended dilution criteria. Dantrolene is typically reconstituted with sterile water prior to administration because it is a powdered medication that requires mixing to prepare the correct dosage for injection. In practice, the recommended dosage for reconstituting Dantrolene requires a specific amount of diluent. For a 20 mg vial, the appropriate volume is often detailed in guidance materials or product inserts, which recommend using 60 cc (or mL) of sterile, non-bacteriostatic water. This amount ensures that the solution is adequately mixed, achieving the proper concentration for administration, while also allowing for easier withdrawal of the medication from the vial. Using 60 cc of water provides sufficient volume to adequately dissolve the powder, while also making it easier for healthcare professionals to withdraw a precise dose of the medication for patient treatment. It's critical that the guidelines provided by the manufacturer are followed to ensure patient safety and therapeutic effectiveness.