Air Methods Critical Care Practice Exam (Sample)

Study Guide

BY EXAMZIFY

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Questions

1. **Which phenomenon is indicated by the Ashman phenomenon?**
   - A. Aberrant conduction in ventricular tachycardia
   - B. Atrial flutter during exercise
   - C. Aberrant conduction from supraventricular beats
   - D. Drastic heart rate changes in isoelectric states

2. **What is the range for creatinine levels in mg/dL considered normal?**
   - A. 0.2-0.6
   - B. 0.6-1.3
   - C. 1.4-1.8
   - D. 1.8-2.5

3. **How is Stroke Volume calculated?**
   - A. By multiplying heart rate by blood pressure
   - B. By subtracting end-systolic volume from end-diastolic volume
   - C. By averaging left and right ventricular outputs
   - D. By measuring the arterial blood flow

4. **What is the second dose of amiodarone administered during adult cardiac arrest?**
   - A. 150 mg
   - B. 300 mg
   - C. 250 mg
   - D. 100 mg

5. **What should be administered in cases of massive saddle pulmonary embolism (PE)?**
   - A. Heparin
   - B. Fibrinolytics
   - C. Lasix
   - D. Aspirin

6. Which condition is an indication for FFP transfusion?

- **A. Acute Blood Loss**
- **B. Burns**
- **C. Chronic Pain**
- **D. Asthma**

7. What is the appropriate cardioversion dose for pediatric patients?

- **A. 0.5 J/kg**
- **B. 1 J/kg**
- **C. 1.5 J/kg**
- **D. 2 J/kg**

8. What is the normal concentration of sodium in mEq/L?

- **A. 120-130**
- **B. 130-135**
- **C. 135-145**
- **D. 145-150**

9. What condition could be indicated by a new LBBB on an EKG?

- **A. Normal cardiac function**
- **B. Myocardial ischemia**
- **C. STEMI**
- **D. Pericarditis**

10. What is the typical rate of a junctional escape rhythm?

- **A. 20-40 beats per minute**
- **B. 40-60 beats per minute**
- **C. 60-100 beats per minute**
- **D. 100-120 beats per minute**

Answers

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

Explanations

1. Which phenomenon is indicated by the Ashman phenomenon?

- A. Aberrant conduction in ventricular tachycardia
- B. Atrial flutter during exercise
- C. Aberrant conduction from supraventricular beats
- D. Drastic heart rate changes in isoelectric states

The Ashman phenomenon is characterized by aberrant conduction that occurs specifically following a supraventricular beat, such as a premature atrial contraction (PAC). This phenomenon typically arises in the context of a pre-existing bundle branch block, particularly when there is a change in the heart rate. As a result, when a normal impulse encounters this situation, it may lead to a wider QRS complex due to the altered conduction pathway. In essence, the phenomenon represents the heart's response to changes in timing between beats — when the interval preceding the supraventricular beat is shorter, it often results in a normal QRS complex, but when there is a longer interval, the subsequent beat may manifest as a wide QRS complex. This illustrates the heart's conduction system's adaptability and its susceptibility to rhythmic variations. The other options do not accurately represent the Ashman phenomenon as it specifically involves the aberrant conduction from supraventricular beats rather than other types of arrhythmias or conditions.

2. What is the range for creatinine levels in mg/dL considered normal?

- A. 0.2-0.6
- B. 0.6-1.3
- C. 1.4-1.8
- D. 1.8-2.5

The normal range for creatinine levels in serum is between 0.6 and 1.3 mg/dL. Creatinine is a waste product formed from muscle metabolism and is typically excreted by the kidneys. Therefore, measuring creatinine levels is a crucial indicator of kidney function. A level within this normal range suggests that the kidneys are effectively filtering waste from the bloodstream. Levels below this range may indicate lower muscle mass or other factors, whereas elevated levels could signal kidney impairment or dysfunction. Hence, understanding the normal range is essential for assessing renal health and guiding clinical decisions.

3. How is Stroke Volume calculated?

A. By multiplying heart rate by blood pressure

B. By subtracting end-systolic volume from end-diastolic volume

C. By averaging left and right ventricular outputs

D. By measuring the arterial blood flow

Stroke volume is defined as the volume of blood ejected by the left ventricle of the heart during each contraction. The most accurate method to calculate stroke volume involves measuring the difference between end-diastolic volume (the amount of blood in the ventricle just before it contracts) and end-systolic volume (the amount of blood left in the ventricle after contraction). By subtracting end-systolic volume from end-diastolic volume, you determine how much blood was pumped out of the ventricle during that heartbeat, which is precisely what stroke volume represents. The other choices do not provide the correct calculation for stroke volume. Simply multiplying heart rate by blood pressure does not reflect the volume of blood ejected with each heartbeat. Averaging outputs of both ventricles is not a standard method for determining stroke volume since stroke volume is specific to the left ventricle in most contexts related to cardiac output. Finally, measuring arterial blood flow is more related to the assessment of vascular health rather than the direct calculation of stroke volume.

4. What is the second dose of amiodarone administered during adult cardiac arrest?

A. 150 mg

B. 300 mg

C. 250 mg

D. 100 mg

In the context of treating adult cardiac arrest, the second dose of amiodarone is typically 150 mg. This dosage is administered to help manage life-threatening ventricular arrhythmias, including ventricular fibrillation and pulseless ventricular tachycardia, that have not responded to initial defibrillation and first-line medications. The rationale for using 150 mg for the second dose is based on established protocols designed to optimize the drug's effectiveness while minimizing the risk of adverse effects. Administering this dosage allows for a higher likelihood of restoring effective cardiac rhythm without overwhelming the patient's system with excessive medication. By contrast, the first dose of amiodarone in cardiac arrest situations is often 300 mg, which is aimed at providing a strong initial intervention. However, subsequent doses are adjusted to maintain therapeutic levels and support the patient's recovery. Understanding the role of amiodarone and the appropriate dosages is crucial for first responders and medical personnel managing critical cardiac events.

5. What should be administered in cases of massive saddle pulmonary embolism (PE)?

A. Heparin

B. Fibrinolytics

C. Lasix

D. Aspirin

In cases of massive saddle pulmonary embolism, the administration of fibrinolytics is critical because this condition represents a medical emergency characterized by significant obstruction of blood flow through the lungs. Fibrinolytics work by dissolving the clot that is blocking blood flow in the pulmonary arteries, therefore facilitating the restoration of circulation to the affected areas of the lungs. The rapid resolution of the embolism improves cardiac function and reduces the likelihood of severe complications, including death. The urgency of this situation often requires aggressive treatment, and fibrinolytics are specifically indicated for massive or high-risk pulmonary embolisms due to their ability to quickly break down the thrombus. This is in contrast to other treatments that may be beneficial in different contexts but do not have the same level of necessity in cases where immediate intervention is required to prevent catastrophic outcomes. Other agents, such as heparin, while important for preventing further clot formation, do not act as quickly as fibrinolytics in emergency situations. Diuretics like Lasix are generally used for fluid overload and have no role in the direct treatment of the embolism itself, while aspirin is typically used to manage coronary artery conditions but does not provide the necessary impact on a massive pulmonary embolism.

6. Which condition is an indication for FFP transfusion?

A. Acute Blood Loss

B. Burns

C. Chronic Pain

D. Asthma

Fresh frozen plasma (FFP) transfusion is indicated in conditions where there is a need for replacement of clotting factors, particularly in patients who are at risk of bleeding due to coagulopathy or when specific clotting factors are deficient. In the context of burns, especially extensive third-degree burns, there can be significant fluid and protein loss, including clotting factors. The administration of FFP can help restore these factors and improve clotting, thus managing the risk of bleeding and supporting overall hemostatic function in critically injured patients. Acute blood loss generally requires packed red blood cells (PRBCs) for volume and hemoglobin replacement, rather than FFP unless there is concurrent coagulopathy. Chronic pain and asthma are not conditions that typically involve deficiencies in clotting factors, making FFP transfusion unnecessary in those cases.

7. What is the appropriate cardioversion dose for pediatric patients?

- **A. 0.5 J/kg**
- **B. 1 J/kg**
- **C. 1.5 J/kg**
- **D. 2 J/kg**

In pediatric patients, the appropriate dose for cardioversion is generally considered to be 1 J/kg. This dose is effective for converting common dysrhythmias, such as supraventricular tachycardia (SVT) or atrial fibrillation, in children. While lower doses like 0.5 J/kg may be used in specific situations or for less severe cases, starting at 1 J/kg provides a more standard and reliable threshold for successful treatment in many circumstances. Using a standard cardioversion dose of 1 J/kg allows healthcare providers to apply consistent protocols across various cases, ensuring that the treatment is both effective and safe. The rationale for this dosing strategy is based on clinical studies and guidelines that aim to balance efficacy with safety, minimizing the risk of arrhythmias or complications that may arise from under-dosing. In practice, if the initial dose of 1 J/kg is ineffective, a provider may then escalate the dose in subsequent attempts, always within the safe parameters established by pediatric advanced life support protocols.

8. What is the normal concentration of sodium in mEq/L?

- **A. 120-130**
- **B. 130-135**
- **C. 135-145**
- **D. 145-150**

The normal concentration of sodium in the blood is widely accepted to be in the range of 135 to 145 mEq/L. Sodium is a crucial electrolyte that plays various roles in the body, including maintaining fluid balance, transmitting nerve impulses, and muscle contraction. Values below this range may indicate hyponatremia, while values above may indicate hypernatremia, both of which can lead to significant health issues. This range is standard in clinical practice, and it ensures that healthcare professionals have a common benchmark for assessing a patient's sodium levels during evaluations and treatments. Understanding this range is critical for managing patients effectively, especially in critical care settings where electrolyte imbalances can lead to severe complications.

9. What condition could be indicated by a new LBBB on an EKG?

A. Normal cardiac function

B. Myocardial ischemia

C. STEMI

D. Pericarditis

A new left bundle branch block (LBBB) on an electrocardiogram (EKG) is a significant finding that can indicate serious underlying cardiac issues. In this context, its association with STEMI (ST-Elevation Myocardial Infarction) is critical. A new LBBB can serve as a marker of acute myocardial infarction, especially when it appears in conjunction with additional symptoms or findings that suggest ongoing ischemia. LBBB typically alters the normal conduction pathway through the heart, which can lead to delays in ventricular depolarization and potentially compromise cardiac function. In cases of STEMI, the presence of a new LBBB may indicate that there is significant blockage in one of the coronary arteries that is affecting the left ventricle's ability to function effectively. The diagnois of STEMI can be supported when LBBB is new, especially if there are associated ST segment changes in the EKG tracing. Other conditions, such as myocardial ischemia may be suggested, but while ischemia can cause various EKG changes, it does not specifically correlate to a new LBBB as directly as STEMI does in the context of acute presentations. Conditions like pericarditis typically present with other characteristic features on EKG and would not primarily present

10. What is the typical rate of a junctional escape rhythm?

A. 20-40 beats per minute

B. 40-60 beats per minute

C. 60-100 beats per minute

D. 100-120 beats per minute

A junctional escape rhythm is a type of cardiac rhythm that occurs when the sinoatrial (SA) node fails to generate an impulse or when there is a block preventing impulses from reaching the atria. In this case, the atrioventricular (AV) junction takes over as the pacemaker of the heart. The intrinsic firing rate of the junction is between 40 and 60 beats per minute, which is why the correct answer is associated with this range. Understanding this concept is essential, as it highlights the body's ability to maintain cardiac output even when higher centers of the conduction system fail. The lower rate compared to a normal sinus rhythm (which typically ranges from 60 to 100 beats per minute) reflects the junction's role as a backup pacemaker. Such knowledge is crucial for recognizing various cardiac rhythms and understanding their physiological implications in critical care settings.