Critical Care Paramedic Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Questions

1. **In the Stanford classification, which type refers to aortic dissection affecting the ascending aorta?**

   A. Type A

   B. Type B

   C. Type C

   D. Type D

2. **What is the formula to calculate minute volume in ventilation?**

   A. Tidal volume + respiratory rate

   B. Tidal volume x respiratory rate

   C. Respiratory rate - tidal volume

   D. Respiratory rate + tidal volume

3. **What condition is strongly associated with new onset left bundle branch block (LBBB)?**

   A. Hypertension

   B. Aortic stenosis

   C. Acute myocardial infarction

   D. Coronary artery disease

4. **Which of the following currents can cause a tetanic contraction that immobilizes a victim?**

   A. Direct current (DC)

   B. High voltage AC

   C. Low voltage AC

   D. Static electricity

5. **Which respiratory pattern indicates a poor prognosis due to its irregularity?**

   A. Biots

   B. Kussmaul

   C. Ataxic

   D. Cheyne-Stokes

6. In ventilator delivery methods, what is continuously monitored in Pressure control?

- **A. Inspiratory time**
- **B. Volumes**
- **C. Pressures**
- **D. Flow rates**

7. What change occurs in hematocrit levels during pregnancy?

- **A. Increased**
- **B. Decreased**
- **C. No change**
- **D. Fluctuates significantly**

8. What is a common laboratory consequence of chronic renal failure?

- **A. Hyperkalemia**
- **B. Hypomagnesemia**
- **C. Hypernatremia**
- **D. Hypoglycemia**

9. What describes gastroschisis?

- **A. Protrusion of viscera through an abdominal ring**
- **B. Abdominal contents outside the body on one side of the umbilical cord**
- **C. A condition with no bowel involvement**
- **D. Contents covered by a sac**

10. What is Total Lung Capacity (TLC)?

- **A. The sum of tidal volume and residual volume**
- **B. RV + VC (TV + IRV + ERV)**
- **C. The total air volume that can be held in the lungs**
- **D. The sum of all lung volumes in a healthy individual**

Answers

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

Explanations

1. In the Stanford classification, which type refers to aortic dissection affecting the ascending aorta?

A. Type A

B. Type B

C. Type C

D. Type D

In the Stanford classification of aortic dissections, Type A is characterized by the involvement of the ascending aorta. This classification is crucial for determining the management and treatment strategies for aortic dissection because Type A dissections are typically associated with a higher risk of complications, such as aortic rupture or cardiac tamponade, due to their proximity to the heart. In this type of dissection, the tear occurs in the intimal layer of the aorta and can propagate along the aorta, potentially involving the arch and descending aorta as well. Type A dissections often require surgical intervention, whereas Type B dissections, which involve only the descending thoracic aorta, are usually managed medically unless there are complications. Understanding these differences is vital in the context of emergency care, as it guides clinicians in making decisions about urgent surgical evaluations and interventions.

2. What is the formula to calculate minute volume in ventilation?

A. Tidal volume + respiratory rate

B. Tidal volume x respiratory rate

C. Respiratory rate - tidal volume

D. Respiratory rate + tidal volume

The formula to calculate minute volume in ventilation is tidal volume multiplied by respiratory rate. Minute volume, also referred to as minute ventilation, is the total volume of gas inhaled or exhaled from a person's lungs in one minute. By using the tidal volume, which indicates the amount of air exchanged in each breath, and the respiratory rate, which measures how many breaths are taken in one minute, this calculation provides a comprehensive view of a person's ventilation status. This calculation is critical in critical care settings, as it helps assess how effectively a patient is ventilating and can guide interventions if their ventilation is insufficient or needs adjustment. Understanding this relationship between tidal volume and respiratory rate is essential for managing patients in respiratory distress or those requiring mechanical ventilation.

3. What condition is strongly associated with new onset left bundle branch block (LBBB)?

A. Hypertension

B. Aortic stenosis

C. Acute myocardial infarction

D. Coronary artery disease

New onset left bundle branch block (LBBB) is particularly associated with acute myocardial infarction (AMI) due to its effects on the heart's electrical conduction system. During an AMI, there can be an obstruction of blood flow to the heart muscle, which can cause ischemia or damage to the tissues. This damage may interrupt the conduction pathways of the heart, leading to the development of a LBBB. In the context of AMI, LBBB can signify that there is a significant left-sided heart issue, often associated with a larger area of myocardial damage that may not just be limited to the heart's walls but can involve the central part where electrical impulses are generated and conducted. LBBB can also complicate the interpretation of an electrocardiogram (ECG), as it may mask changes commonly associated with myocardial ischemia, making it crucial for healthcare providers to recognize the significance of a new LBBB in the context of potential acute cardiac events. While conditions such as hypertension, aortic stenosis, and coronary artery disease may be related to LBBB, they are more often associated with pre-existing conduction abnormalities rather than being indicators of acute myocardial events.

4. Which of the following currents can cause a tetanic contraction that immobilizes a victim?

A. Direct current (DC)

B. High voltage AC

C. Low voltage AC

D. Static electricity

High voltage alternating current (AC) is the type of current most likely to cause a tetanic contraction that can immobilize a victim. Tetanic contractions occur when the muscle fibers contract continuously without relaxation, which can happen when a strong enough electrical current passes through the body. High voltage AC can produce a powerful and sustained muscular contraction because it alternates its direction and can penetrate body tissues more effectively than other forms of current. This allows it to stimulate motor neurons and lead to involuntary muscle contractions, sometimes so severe that they can cause the person to be unable to release an object or free themselves from the source of the current. In contrast, direct current (DC) can also cause muscle contractions, but these contractions are more likely to be intermittent rather than tetanic and may not result in sustained immobility. Low voltage AC does not typically provide sufficient current strength to induce such powerful contractions. Static electricity generally does not produce the sustained effects on muscle contraction that alternating or direct currents do, as it involves a brief discharge rather than a continuous current flow.

5. Which respiratory pattern indicates a poor prognosis due to its irregularity?

A. Biots

B. Kussmaul

C. Ataxic

D. Cheyne-Stokes

The correct choice refers to Ataxic breathing, which is characterized by completely irregular and unpredictable respiratory patterns. This type of respiration can vary in depth and rate, presenting as gasps or periods of no breathing, which can reflect significant neurological dysfunction or severe brain injury. Such irregularity in the respiratory pattern is usually a sign of poor prognosis because it indicates a compromised ability of the central nervous system to regulate respiration effectively. In patients with Ataxic breathing, the underlying causes might be related to conditions affecting the brainstem, which is critical in controlling autonomic functions including breathing. Thus, the irregularity signifies a potentially unstable clinical condition that may lead to respiratory failure or other serious complications. Other patterns like Kussmaul and Cheyne-Stokes have more defined, repetitive characteristics. Kussmaul breathing is deep and labored, often associated with metabolic acidosis and a specific clinical state. Cheyne-Stokes respiration involves a cyclical pattern of waxing and waning tidal volumes followed by periods of apnea, typically seen in heart failure or neurological impairment but carries different implications regarding prognosis than Ataxic breathing. Biots are characterized by groups of quick, shallow breaths followed by periods of apnea which can also indicate a significant problem, but they are not

6. In ventilator delivery methods, what is continuously monitored in Pressure control?

A. Inspiratory time

B. Volumes

C. Pressures

D. Flow rates

In a pressure control mode of ventilation, the primary focus is on maintaining a set pressure during the inspiratory phase of ventilation. The ventilator delivers a breath until the predetermined peak inspiratory pressure is reached, regardless of the volume delivered. This means that the parameters such as volumes are not continuously monitored as they are in volume control modes, where a specific tidal volume is targeted. In pressure control ventilation, it is critical to monitor the pressures to ensure the desired pressure limit is not exceeded, as elevated pressures can cause barotrauma or other lung injuries. The ventilator will continuously assess the pressure in the breathing circuit to ensure that it adheres to the set limits, allowing for adjustments in flow or inspiratory time based on the patient's needs and lung mechanics. Therefore, monitoring pressures is essential for patient safety and effective ventilation management, as it reflects the compliance of the respiratory system and indicates how effectively the lungs are being ventilated under the current settings.

7. What change occurs in hematocrit levels during pregnancy?

A. Increased

B. Decreased

C. No change

D. Fluctuates significantly

During pregnancy, hematocrit levels typically decrease. This reduction is primarily due to the expansion of plasma volume, which occurs to accommodate the increased blood flow needed for the developing fetus and to support the mother's physiological changes. Although red blood cell mass does increase during pregnancy, the increase in plasma volume is proportionally greater, leading to a dilutional effect on the hematocrit. This phenomenon is often referred to as "physiological anemia of pregnancy." It is important to recognize that while the total number of red blood cells increases, the relative proportion of red blood cells to plasma decreases, resulting in a lower hematocrit level. Understanding this adaptation is crucial for healthcare providers, as it helps differentiate normal physiological changes from potential pathological conditions during pregnancy.

8. What is a common laboratory consequence of chronic renal failure?

A. Hyperkalemia

B. Hypomagnesemia

C. Hypernatremia

D. Hypoglycemia

Chronic renal failure, or chronic kidney disease (CKD), leads to a variety of metabolic derangements due to the kidneys' diminished ability to filter and excrete waste products and maintain electrolyte balance. One of the most significant laboratory findings in patients with chronic renal failure is hyperkalemia, which is an elevated level of potassium in the blood. The kidneys are primarily responsible for excreting potassium. In cases of chronic renal failure, the kidneys cannot effectively eliminate potassium, leading to its accumulation in the bloodstream. This is particularly concerning as hyperkalemia can result in life-threatening cardiac arrhythmias, making it a critical condition that healthcare providers must monitor closely in patients with kidney dysfunction. While hypomagnesemia, hypernatremia, and hypoglycemia can occur under certain circumstances, they are not as commonly associated with chronic renal failure as hyperkalemia. Hypomagnesemia may occur due to various reasons, including dietary inadequacies and certain medications, but the kidneys typically regulate magnesium levels to some extent. Hypernatremia, or elevated sodium levels, is usually related to volume status and fluid restrictions rather than renal function directly. Hypoglycemia is generally not a consequence of chronic renal failure unless complicated by other factors, such as medications or

9. What describes gastroschisis?

A. Protrusion of viscera through an abdominal ring

B. Abdominal contents outside the body on one side of the umbilical cord

C. A condition with no bowel involvement

D. Contents covered by a sac

Gastroschisis is characterized as a congenital abdominal wall defect in which the abdominal contents, particularly intestines, protrude outside the body. This condition typically occurs to the right of the umbilical cord and does not involve a sac covering the contents, which distinguishes it from similar conditions such as omphalocele. The absence of an overlying peritoneal sac means that the exposed organs are directly in contact with the amniotic fluid, leading to potential complications such as inflammation and damage. The description that emphasizes the abdominal contents being outside the body and situated on one side of the umbilical cord accurately reflects the nature of gastroschisis and highlights the critical aspects of this condition. Understanding this defining characteristic is essential for diagnosis and treatment planning in critical care settings.

10. What is Total Lung Capacity (TLC)?

A. The sum of tidal volume and residual volume

B. RV + VC (TV + IRV + ERV)

C. The total air volume that can be held in the lungs

D. The sum of all lung volumes in a healthy individual

Total Lung Capacity (TLC) is defined as the total air volume that can be held in the lungs, encompassing all functional components of lung volume. This includes the tidal volume (TV), inspiratory reserve volume (IRV), expiratory reserve volume (ERV), and residual volume (RV). TLC provides a comprehensive measure of the lungs' capacity and functionality. In a healthy individual, TLC is calculated as the sum of all lung volumes, which provides insight into the overall health of the respiratory system. Therefore, the correct assertion is that TLC includes every part of lung volume, which is a critical concept in understanding pulmonary function and assessment in critical care settings. This holistic approach to measuring lung capacity helps healthcare professionals to identify respiratory issues and conditions that may affect ventilation, such as restrictive lung diseases or obstructive conditions, thereby guiding appropriate interventions. Understanding TLC is crucial for evaluating the status of patients who may be experiencing respiratory distress or other critical conditions requiring advanced care.