Respiratory Therapy CRT Practice Exam (Sample)

Study Guide

BY EXAMZIFY

Everything you need from our exam experts!

Questions

1. **In which condition does pulmonary edema potentially lead to respiratory acidosis?**
   - **A. Increased lung perfusion**
   - **B. Impaired gas exchange**
   - **C. Improved lung compliance**
   - **D. Increased tidal volume**

2. **What characteristic is essential to assess the effectiveness of vent settings and patient response?**
   - **A. Monitoring blood pressure**
   - **B. Checking arterial blood gas values**
   - **C. Evaluating heart rate**
   - **D. Assessing oxygen saturation only**

3. **A patient with CHF has what type of secretions?**
   - **A. Thick yellow mucus**
   - **B. Thin white or pink frothy secretions**
   - **C. Clear and watery secretions**
   - **D. Thick brown secretions**

4. **Which factor is recognized as a cause of increased dead space in respiratory therapy?**
   - **A. Pulmonary embolism**
   - **B. Chronic bronchitis**
   - **C. Pneumothorax**
   - **D. Asthma**

5. **In the context of obstructive lung disease, what is the FEV1 usually less than?**
   - **A. 90% of predicted**
   - **B. 80% of predicted**
   - **C. 70% of predicted**
   - **D. 60% of predicted**

6. What adjustment is primarily needed to target a specific tidal volume (Vt) during volume control ventilation?

A. Changing the frequency

B. Adjusting the inspiratory time

C. Tweaking the tidal volume setting

D. Modifying the set pressure

7. What is a benefit of using PEEP during mechanical ventilation?

A. It enhances lung recruitment

B. It decreases airway resistance

C. It eliminates the need for sedation

D. It allows for increased tidal volume

8. Where does ventricular contraction begin?

A. Atria

B. Q wave

C. P wave

D. S wave

9. What is a common CNS disorder that might induce respiratory alkalosis?

A. Stroke

B. Multiple sclerosis

C. Seizure activity

D. Cerebral palsy

10. When monitoring a patient on a ventilator, what does a sudden drop in plateau pressure indicate?

A. Increased airway resistance

B. Potential disconnection from the ventilator

C. Elevated lung compliance

D. Improvement in gas exchange

Answers

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

Explanations

1. In which condition does pulmonary edema potentially lead to respiratory acidosis?

A. Increased lung perfusion

B. Impaired gas exchange

C. Improved lung compliance

D. Increased tidal volume

Pulmonary edema can lead to respiratory acidosis primarily due to impaired gas exchange. In this condition, excess fluid in the lung tissues and alveoli obstructs the efficient transfer of oxygen and carbon dioxide between the air and the bloodstream. As a result, the body struggles to adequately oxygenate the blood and expel carbon dioxide, leading to an accumulation of carbon dioxide (hypercapnia). This buildup of carbon dioxide can decrease the pH of the blood, resulting in respiratory acidosis. Understanding the context of impaired gas exchange is vital. In pulmonary edema, the fluid acts as a barrier, disrupting the normal diffusion processes required for gas exchange. This impairment not only affects oxygen intake but also hinders the body's ability to remove carbon dioxide effectively, contributing to the development of respiratory acidosis. Other factors mentioned in the other options do not align with the mechanism that directly causes respiratory acidosis in this scenario. Increased lung perfusion and improved lung compliance might not necessarily correlate with the impaired gas exchange seen in pulmonary edema, and increased tidal volume does not inherently lead to acidosis; in fact, it is often a compensatory mechanism the body uses to try to improve gas exchange.

2. What characteristic is essential to assess the effectiveness of vent settings and patient response?

A. Monitoring blood pressure

B. Checking arterial blood gas values

C. Evaluating heart rate

D. Assessing oxygen saturation only

Evaluating arterial blood gas values is essential for assessing the effectiveness of ventilator settings and the patient's response because these values provide direct insight into the patient's respiratory function and acid-base balance. Arterial blood gases (ABGs) will reveal critical information such as the levels of oxygen (PaO_2) and carbon dioxide ($PaCO_2$) in the blood, as well as the patient's pH. Monitoring these parameters allows respiratory therapists to determine whether the ventilator settings are adequately meeting the patient's needs, particularly in terms of oxygenation and ventilation. For instance, if the $PaCO_2$ is elevated, it may indicate inadequate ventilation, necessitating adjustments to the ventilator settings. Similarly, low PaO_2 levels could signify poor oxygenation, prompting a review of the oxygen delivery system or tidal volume used. While monitoring blood pressure, heart rate, and oxygen saturation are important components of a patient's overall clinical assessment, they do not provide as direct a measure of the ventilatory exchange and gas exchange occurring in the lungs as arterial blood gases. Thus, ABGs are a vital tool in ensuring that the respiratory therapy being provided is effective and appropriate for the patient's condition.

3. A patient with CHF has what type of secretions?

A. Thick yellow mucus

B. Thin white or pink frothy secretions

C. Clear and watery secretions

D. Thick brown secretions

The presence of thin white or pink frothy secretions in a patient with congestive heart failure (CHF) is indicative of pulmonary edema, which is a common complication associated with this condition. In CHF, the heart is unable to pump blood efficiently, leading to increased pressure in the pulmonary capillaries. This increased pressure causes fluid to leak into the alveoli of the lungs, mixing with air and producing the characteristic frothy sputum. The pink color often associated with these secretions can be attributed to the presence of blood, which may arise from the capillary damage due to the elevated pressures. The consistency of these secretions is typically described as thin and frothy, distinguishing them from other types of secretions that might be associated with different respiratory or systemic conditions.

4. Which factor is recognized as a cause of increased dead space in respiratory therapy?

A. Pulmonary embolism

B. Chronic bronchitis

C. Pneumothorax

D. Asthma

Increased dead space in the lungs refers to areas where ventilation occurs without corresponding perfusion, meaning that air reaches the alveoli but does not participate in gas exchange. Pulmonary embolism is recognized as a significant cause of increased dead space because it creates an obstruction in the pulmonary arteries, which prevents blood flow to portions of the lung. This leads to ventilation being wasted, as the air in affected alveoli cannot engage in gas exchange, resulting in an increase in physiological dead space. When a pulmonary embolism occurs, it can result in substantial areas of the lung being ventilated but not perfused, significantly affecting the efficiency of gas exchange. This is critical in respiratory therapy, as it influences the management and treatment of patients with such conditions, emphasizing the importance of effective perfusion in addition to ventilation for optimal respiratory function. In contrast, chronic bronchitis, pneumothorax, and asthma primarily affect airflow and airway resistance rather than directly increasing dead space through mechanisms like obstruction of perfusion.

5. In the context of obstructive lung disease, what is the FEV1 usually less than?

A. 90% of predicted

B. 80% of predicted

C. 70% of predicted

D. 60% of predicted

In obstructive lung disease, the FEV1 (Forced Expiratory Volume in one second) is typically less than 80% of the predicted value. This measurement is crucial for assessing the severity of obstruction in the airways. When the FEV1 falls below this threshold, it indicates significant airway limitation, commonly seen in conditions such as asthma and chronic obstructive pulmonary disease (COPD). A FEV1 value of 80% or less suggests that there is notable difficulty in expelling air from the lungs, which is characteristic of obstructive pathology. This reduction in airflow can be due to various factors, including inflammation, bronchoconstriction, or structural changes in the airways. The relationship between FEV1 and the severity of lung disease is an essential part of respiratory therapy and helps guide treatment decisions, including the use of bronchodilators and corticosteroids. Understanding the FEV1 value in the context of lung function testing aids clinicians in diagnosing and managing obstructive lung diseases effectively.

6. What adjustment is primarily needed to target a specific tidal volume (Vt) during volume control ventilation?

A. Changing the frequency

B. Adjusting the inspiratory time

C. Tweaking the tidal volume setting

D. Modifying the set pressure

To target a specific tidal volume (Vt) during volume control ventilation, the primary adjustment needed is to tweak the tidal volume setting. Volume control ventilation is designed to deliver a predetermined volume of air to the patient with each breath. By setting the tidal volume on the ventilator, the therapist can ensure that the patient receives the exact amount of air necessary for effective ventilation. When the tidal volume is set, the ventilator automatically adjusts the airflow to meet this target based on the patient's respiratory mechanics. This is crucial in ensuring enough ventilation while preventing complications such as barotrauma that might arise from delivering excessive volumes. Adjusting other parameters, such as frequency or inspiratory time, may impact the dynamics of the ventilation process but would not directly change the target tidal volume itself. Modifying set pressure is more relevant in pressure-controlled ventilation, where the focus is on limiting the pressure during inspiratory phases rather than achieving a specific tidal volume.

7. What is a benefit of using PEEP during mechanical ventilation?

A. It enhances lung recruitment

B. It decreases airway resistance

C. It eliminates the need for sedation

D. It allows for increased tidal volume

Using PEEP (Positive End-Expiratory Pressure) during mechanical ventilation primarily enhances lung recruitment. PEEP works by maintaining a certain level of pressure in the airways at the end of expiration. This prevents the alveoli from fully collapsing, thus recruiting collapsed or partially inflated lung units and increasing the surface area available for gas exchange. When alveoli are recruited, it improves ventilation-perfusion matching within the lungs, which can ultimately lead to better oxygenation for the patient using mechanical ventilation. This recruitment is especially beneficial in patients with conditions like Acute Respiratory Distress Syndrome (ARDS), where alveolar collapse is more common. The other options focus on different concepts that are not directly related to the benefits of PEEP. For instance, while PEEP can influence tidal volume indirectly by improving compliance and lung mechanics, its primary advantage is not to increase tidal volume directly. Additionally, PEEP is not used to decrease airway resistance or eliminate the need for sedation; these elements pertain to broader aspects of ventilatory strategies and patient comfort management.

8. Where does ventricular contraction begin?

A. Atria

B. Q wave

C. P wave

D. S wave

Ventricular contraction begins in the ventricles of the heart, specifically after the electrical activity has moved through the conduction system. The correct answer is associated with the Q wave, which is part of the QRS complex in an electrocardiogram (ECG). The Q wave represents the initial depolarization of the ventricles, signaling the start of ventricular contraction. This depolarization triggers the ventricles to contract and pump blood out of the heart. The significance of the Q wave lies in its timing; it indicates that the ventricles have received the electrical impulse necessary for contraction following the atrial depolarization represented by the P wave. The P wave itself corresponds to atrial depolarization, and while it is a critical part of the cardiac cycle, it does not initiate ventricular contraction. The S wave, also part of the QRS complex, follows the Q wave and is associated with having already begun ventricular contraction. Thus, understanding the relationship between these waves on an ECG is crucial for recognizing the sequence of electrical events leading to effective heart function.

9. What is a common CNS disorder that might induce respiratory alkalosis?

A. Stroke

B. Multiple sclerosis

C. Seizure activity

D. Cerebral palsy

Respiratory alkalosis is characterized by an increase in blood pH due to decreased levels of carbon dioxide, often resulting from hyperventilation. Seizure activity can induce hyperventilation as a result of increased respiratory drive triggered by neuronal excitability in the brain. The elevated respiratory rate leads to excessive loss of carbon dioxide, causing the blood pH to rise and resulting in respiratory alkalosis. In the context of central nervous system (CNS) disorders, seizure activity is distinctly associated with changes in breathing patterns that can lead to this particular acid-base disturbance. Understanding the mechanism helps recognize why seizure activity is the correct choice for inducing respiratory alkalosis. Other CNS disorders such as stroke, multiple sclerosis, and cerebral palsy may have different effects on breathing and management might not necessarily lead to respiratory alkalosis, as they can also be associated with breathing difficulties or hypoventilation.

10. When monitoring a patient on a ventilator, what does a sudden drop in plateau pressure indicate?

A. Increased airway resistance

B. Potential disconnection from the ventilator

C. Elevated lung compliance

D. Improvement in gas exchange

A sudden drop in plateau pressure when monitoring a patient on a ventilator typically indicates potential disconnection from the ventilator. Plateau pressure is measured during an inspiratory hold and is reflective of the pressure in the alveoli when there is no airflow. If there is a disconnection, the absence of resistance from the ventilator leads to a significant decrease in pressure readings. This can suggest that the ventilatory support is no longer appropriately reaching the patient's lungs, which can pose serious risks if not quickly identified and resolved. In cases of increased airway resistance or elevated lung compliance, one would typically expect to see changes in plateau pressure that do not align with a sudden drop; instead, increases in resistance might raise plateau pressure, while improved lung compliance usually results in lower pressures during normal operations, but not a sudden drop. An improvement in gas exchange can improve oxygenation and carbon dioxide removal but would not necessarily cause an immediate drop in plateau pressure, as plateau pressure relates specifically to mechanical ventilation dynamics rather than gas exchange efficiency. Thus, recognizing a sudden drop in plateau pressure as a potential disconnection is crucial for patient safety and effective respiratory management.