

Certified Hyperbaric Technologist Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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SAMPLE

Questions

- 1. What does a rise in pressure in a gas sample generally require, according to Boyle's Law principles?**
 - A. A decrease in temperature**
 - B. An increase in volume**
 - C. A decrease in volume**
 - D. An increase in the amount of gas**
- 2. What precaution should be taken before initiating HBO therapy for a patient taking doxorubicin (Adriamycin)?**
 - A. Administer HBO therapy immediately**
 - B. Wait 3 days for the drug to clear the body**
 - C. Increase dosage of doxorubicin**
 - D. Consult a specialist for approval**
- 3. If a balloon filled at sea level is taken to a certain depth, which of the following is true regarding its behavior?**
 - A. It becomes larger**
 - B. It remains the same size**
 - C. It shrinks**
 - D. It explodes**
- 4. What type of bacterium causes actinomycosis?**
 - A. Facultative anaerobe**
 - B. Aerobic bacterium**
 - C. Anaerobic bacterium**
 - D. Gram-negative bacillus**
- 5. At the end of an in-chamber IV treatment, what should you do regarding the IV line?**
 - A. Add a large amount of fluid to the IV**
 - B. Ensure there is no air in the drip chamber**
 - C. Add a small amount of fluid to the drip chamber**
 - D. Disconnect the IV line immediately**

- 6. According to NFPA 99, which fabric type is NOT required for hyperbaric garments?**
- A. 100% cotton**
 - B. Polyester blends**
 - C. Wool**
 - D. Linen blends**
- 7. What is a Class B chamber according to NFPA 99?**
- A. Multiplace, multiple human occupancy**
 - B. No human occupancy**
 - C. Single human occupancy**
 - D. Animal use only**
- 8. What is the primary reason for treating pregnant patients after CO exposure?**
- A. Increased oxygen needs**
 - B. Fetal hemoglobin binds tighter to CO**
 - C. Risk of stillbirth**
 - D. Immediate recovery**
- 9. A fire suppression system is mandated in which type of chamber according to NFPA 99?**
- A. Class B Chamber**
 - B. Multiplace Chamber**
 - C. Class A Chamber**
 - D. Portable Chamber**
- 10. What is the characteristic of matter in the gas phase?**
- A. Definite shape and volume**
 - B. Fixed position of particles**
 - C. Atoms or molecules move randomly**
 - D. High density compared to solids**

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. What does a rise in pressure in a gas sample generally require, according to Boyle's Law principles?

- A. A decrease in temperature**
- B. An increase in volume**
- C. A decrease in volume**
- D. An increase in the amount of gas**

According to Boyle's Law, which states that the pressure of a gas is inversely proportional to its volume when temperature and the amount of gas are held constant, a rise in pressure necessitates a decrease in volume. This means that as the pressure on a gas increases, it must occupy a smaller volume to maintain the same amount of gas at a constant temperature. This relationship can also be understood by recognizing that increasing the pressure compresses the gas molecules closer together, thus reducing the space they occupy. In the context of the provided options, a rise in pressure in a gas sample is best described by a decrease in volume, aligning precisely with Boyle's Law principles. While changes in temperature or the amount of gas can affect pressure, they aren't the primary factors at play in this specific scenario. Thus, decreasing the volume directly relates to increasing the pressure, substantiating the correct response.

2. What precaution should be taken before initiating HBO therapy for a patient taking doxorubicin (Adriamycin)?

- A. Administer HBO therapy immediately**
- B. Wait 3 days for the drug to clear the body**
- C. Increase dosage of doxorubicin**
- D. Consult a specialist for approval**

Before initiating hyperbaric oxygen (HBO) therapy for a patient who is taking doxorubicin (Adriamycin), it is important to wait for a period of time to allow the drug to clear the body. Doxorubicin is an anthracycline antibiotic that has well-documented side effects and interactions, particularly with treatments like HBO therapy. One significant concern with combining HBO therapy and doxorubicin is that both treatments can exert effects on the cardiovascular system. Doxorubicin can increase the risk of cardiotoxicity, and HBO therapy itself can lead to variations in blood pressure and heart rate due to increased atmospheric pressure and oxygen levels. By waiting for the drug to clear, it minimizes the potential for adverse interactions that could exacerbate these cardiovascular risks. Additionally, the body metabolizes doxorubicin over a certain period, and allowing time for clearance helps ensure that the drug is at a less significant level in the bloodstream, reducing the risk of complications during HBO therapy. In summary, taking a precautionary approach to wait for doxorubicin clearance is essential to promote patient safety and optimize the therapeutic outcomes of HBO therapy.

3. If a balloon filled at sea level is taken to a certain depth, which of the following is true regarding its behavior?

- A. It becomes larger**
- B. It remains the same size**
- C. It shrinks**
- D. It explodes**

When a balloon filled with air at sea level is taken to a certain depth, it exhibits behavior consistent with the principles of Boyle's Law, which states that at a constant temperature, the pressure of a gas is inversely related to its volume. As the balloon descends into deeper water, the pressure surrounding it increases because of the weight of the water above it. This increased external pressure compresses the gas inside the balloon, which results in a reduction of its volume. Since the balloon is unable to maintain its size due to the increased ambient pressure, it will consequently shrink as it is submerged deeper. This behavior is a direct result of the physical properties of gases under changing pressure and illustrates how external conditions affect gas-filled objects. Understanding this concept is crucial for those studying hyperbaric medicine and technology, as it relates to the behavior of gases at various pressures.

4. What type of bacterium causes actinomycosis?

- A. Facultative anaerobe**
- B. Aerobic bacterium**
- C. Anaerobic bacterium**
- D. Gram-negative bacillus**

Actinomycosis is caused primarily by Actinomyces species, which are classified as anaerobic bacteria. These bacteria thrive in environments without oxygen, making their classification as anaerobes accurate. Actinomycosis can lead to chronic infections that typically present with the formation of abscesses in tissues, most commonly in the jaw, lungs, and other sites. Understanding the nature of Actinomyces as anaerobic bacteria helps clarify the conditions under which they proliferate and the clinical contexts in which infections occur. While facultative anaerobes can survive in both aerobic and anaerobic environments, and aerobic bacteria require oxygen to live, these characteristics do not apply to the anaerobic nature of Actinomyces, which exclusively thrives without oxygen. Similarly, the classification of Gram-negative bacilli does not accurately describe Actinomyces, as they are Gram-positive filamentous bacteria. This distinction is essential in diagnosing and treating infections caused by these organisms effectively.

5. At the end of an in-chamber IV treatment, what should you do regarding the IV line?

- A. Add a large amount of fluid to the IV**
- B. Ensure there is no air in the drip chamber**
- C. Add a small amount of fluid to the drip chamber**
- D. Disconnect the IV line immediately**

At the end of an in-chamber IV treatment, adding a small amount of fluid to the drip chamber is important for several reasons. This practice ensures that there is no opportunity for the formation of air bubbles in the line, which can be especially critical in hyperbaric treatments. Air bubbles can lead to complications, such as air embolism, which can be dangerous in a hyperbaric environment. By adding fluid, you help ensure the line remains filled with solution, minimizing the risk of air entering the line after the treatment. Moreover, keeping the drip chamber filled with fluid helps maintain a clear view of the fluid levels, making it easier to monitor the infusion process during future treatments. This proactive measure is important for patient safety and effective treatment continuity. In contrast, other actions, such as adding a large amount of fluid to the IV or disconnecting the IV line immediately, may not be advisable in this scenario. Adding excessive fluid could lead to complications like fluid overload. Disconnecting the IV line too soon could also introduce air into the line or disrupt the ongoing treatment process. Ensuring there is no air in the drip chamber does not address the need to keep the line filled and prepared for any future infusions. Hence, adding a small amount of

6. According to NFPA 99, which fabric type is NOT required for hyperbaric garments?

- A. 100% cotton**
- B. Polyester blends**
- C. Wool**
- D. Linen blends**

The correct rationale for identifying which fabric type is not required for hyperbaric garments according to NFPA 99 is based on the standards that prioritize safety, fire resistance, and comfort for those using hyperbaric environments. NFPA 99 outlines specific requirements that garments must meet to be deemed safe for use within hyperbaric chambers. While 100% cotton is often favored in many clinical settings for its comfort and breathability, it is not specified as a requirement within NFPA 99 for hyperbaric garments. On the other hand, certain mixtures, such as polyester blends, are commonly utilized in hyperbaric applications because they can offer better fire resistance and durability than pure cotton, aligning with safety regulations. Wool can be a suitable material for its natural fire-resistant properties, and linen blends may also offer similar benefits. Thus, the absence of a requirement for 100% cotton indicates that other fabric types—like polyester blends and wool—are either preferred or mandated for ensuring safety in hyperbaric conditions, while cotton's specific absence means it is not a necessity in this context. This understanding is essential for professionals involved in the operation and management of hyperbaric facilities to ensure compliance with safety standards.

7. What is a Class B chamber according to NFPA 99?

- A. Multiplace, multiple human occupancy**
- B. No human occupancy**
- C. Single human occupancy**
- D. Animal use only**

A Class B chamber, as defined by NFPA 99 (National Fire Protection Association), is specifically designed for single human occupancy. These chambers are intended for therapeutic or clinical treatments and must comply with particular safety and operational standards. The classification delineates the type of environments that can safely facilitate hyperbaric oxygen therapy while ensuring that appropriate protocols and safety measures are adhered to, particularly for single patients. This classification highlights key differences in design, functionality, and operational capabilities compared to other class types, which may accommodate multiple occupants or not include human occupancy at all. The understanding of this classification is crucial for hyperbaric technologists, as it impacts the safety protocols and operational procedures they must follow in clinical practice.

8. What is the primary reason for treating pregnant patients after CO exposure?

- A. Increased oxygen needs**
- B. Fetal hemoglobin binds tighter to CO**
- C. Risk of stillbirth**
- D. Immediate recovery**

The primary reason for treating pregnant patients after carbon monoxide (CO) exposure lies in the unique physiological characteristics of fetal hemoglobin. Fetal hemoglobin has a higher affinity for carbon monoxide compared to adult hemoglobin, meaning it binds to CO more tightly. This increased affinity can lead to a greater degree of fetal hypoxia (low oxygen levels) when the mother is exposed to CO, as the CO displaces oxygen from the binding sites on hemoglobin. In pregnant patients, the fetus is particularly vulnerable to hypoxic conditions since fetal development relies heavily on a consistent oxygen supply. Therefore, even modest exposures to carbon monoxide can have more severe implications for the fetus compared to adults. It is because of this binding characteristic that prompt treatment is crucial to ensure oxygen is restored effectively, reducing the risk of fetal damage, and ultimately, preserving fetal well-being. The other options, while they may relate to the situation, do not encapsulate the most critical reason for treatment. Increased oxygen needs, risk of stillbirth, and immediate recovery all address important concerns, but they stem from the fundamental issue that fetal hemoglobin's affinity for carbon monoxide poses an acute risk to the fetus during maternal CO exposure.

9. A fire suppression system is mandated in which type of chamber according to NFPA 99?

- A. Class B Chamber**
- B. Multiplace Chamber**
- C. Class A Chamber**
- D. Portable Chamber**

A Class A chamber is specifically designed for multi-patient treatments, which typically involves higher operational complexities. According to NFPA 99, fire suppression systems are mandated in these environments due to the increased risks associated with the presence of multiple patients and the equipment used. Class A chambers often involve higher volumes of oxygen use and can therefore pose a significant fire hazard if not properly equipped with fire suppression systems. In contrast, Class B chambers, which are intended for single-patient use or less complex applications, may not require the same strict fire safety measures. Multiplace chambers, while more complex than Class B chambers, may still have different fire suppression requirements based on their specific designs and contents. Portable chambers, being simpler and usually used in limited scope scenarios, typically do not have the same requirements for advanced fire suppression systems as Class A chambers. Thus, the requirements outlined by NFPA 99 prioritize the safety of patients and staff in the more complex and potentially hazardous environment of Class A chambers.

10. What is the characteristic of matter in the gas phase?

- A. Definite shape and volume**
- B. Fixed position of particles**
- C. Atoms or molecules move randomly**
- D. High density compared to solids**

In the gas phase, matter exhibits a characteristic where atoms or molecules move randomly. This randomness is a direct result of the significant amount of energy that the particles possess, allowing them to overcome intermolecular forces that would otherwise hold them in a fixed position. As a result, gas particles are not bound to any specific location and can spread out to fill their container completely, leading to a lack of definite shape and volume. This movement contrasts with solids, where particles maintain a fixed position and vibrate in place, and liquids, where particles are close together but can slide past each other. Additionally, gases typically have much lower densities compared to solids and liquids, further highlighting their unique state. Overall, the ability for gas particles to move freely and randomly is fundamental to the behavior and properties of gases.