# Certified Hyperbaric Technologist Practice Test (Sample)

## Study Guide


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# Questions

1. **True or False: Central nervous system oxygen toxicity occurs from increased partial pressure of oxygen.**

   **A. True**

   **B. False**

   **C. Only in hyperbaric conditions**

   **D. Only in scuba diving**

2. **What does stage decompression refer to?**

   **A. Descending rapidly from maximum depth**

   **B. Ascending at a fixed rate and having decompression stops**

   **C. Maintaining the same depth for extended periods**

   **D. Using supplemental oxygen for longer dives**

3. **Should a healthy, pregnant patient with a COHgb of 15% be treated for carbon monoxide exposure?**

   **A. Yes**

   **B. No**

   **C. Only if symptoms are present**

   **D. Only after consulting a specialist**

4. **In what year did the first recorded use of pressure for respiratory problems occur?**

   **A. 1642**

   **B. 1662**

   **C. 1689**

   **D. 1701**

5. **What is the most common offending organism in gas gangrene?**

   **A. Staphylococcus aureus**

   **B. Clostridium perfringens**

   **C. Escherichia coli**

   **D. Streptococcus pyogenes**

**6. What term did Haldane use to describe tissue compartments that exchange nitrogen at different rates?**

**A. Half-time tissues**

**B. Nitrogen compartments**

**C. Decompression zones**

**D. Gas exchange tissues**

**7. What are common causes of a thermal burn?**

**A. Open fire, steam, cold surfaces, hot gases**

**B. Open fire, steam, hot surfaces, hot liquids**

**C. Electric shock, sunlight, freezing temperatures, hot surfaces**

**D. Hot liquids, chemical exposure, freezing conditions, toxic gases**

**8. Which body area may complicate TcOM data collections?**

**A. Flat surface areas**

**B. Bony prominence**

**C. Muscular regions**

**D. Areas with hair**

**9. Which electrical voltage level is permissible in both monoplace and multiplace hyperbaric chambers?**

**A. 15 volts**

**B. 28 volts**

**C. 40 volts**

**D. 55 volts**

**10. What is the primary purpose of the CGA guidelines regarding compressed gases?**

**A. Safe handling of compressed gases**

**B. Regulation of gas prices**

**C. Designing new gas cylinders**

**D. Testing gas purity**

# Answers

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

# Explanations

## 1. True or False: Central nervous system oxygen toxicity occurs from increased partial pressure of oxygen.

**A. True**

**B. False**

**C. Only in hyperbaric conditions**

**D. Only in scuba diving**

**Central nervous system oxygen toxicity is indeed associated with increased partial pressure of oxygen, making the statement true. This phenomenon occurs when the oxygen levels in the environment are heightened, as is the case in hyperbaric conditions or during deep scuba diving. As the partial pressure of oxygen rises, it can lead to neurological symptoms due to the excessive concentration of oxygen in neural tissues. Hyperbaric oxygen therapy, often used to treat certain medical conditions, can elevate the partial pressure of oxygen significantly, which may pose a risk for oxygen toxicity if safety protocols are not followed. Similarly, scuba divers can experience oxygen toxicity at great depths where the pressure increases the amount of accessible oxygen. Understanding this relationship between partial pressure and oxygen toxicity is crucial for safe practices in both diving and hyperbaric environments.**

## 2. What does stage decompression refer to?

**A. Descending rapidly from maximum depth**

**B. Ascending at a fixed rate and having decompression stops**

**C. Maintaining the same depth for extended periods**

**D. Using supplemental oxygen for longer dives**

**Stage decompression is a crucial concept in diving that refers to the process of ascending from a dive while making specific stops at certain depths. This method is essential for safely removing nitrogen accumulated in the body during a dive to reduce the risk of decompression sickness, also known as "the bends." By ascending at a controlled rate and incorporating decompression stops, divers allow the excess nitrogen to be released from their tissues in a safe manner. This process is especially important when divers have been at greater depths or have extended the duration of their dives, as it helps to manage the ascent to the surface more safely. It contrasts with other methods of ascent, such as direct ascending to the surface without stops, which can lead to dangerous levels of nitrogen in the body and increase the risk of decompression illness. The options presented include different aspects of diving; however, the essence of stage decompression specifically focuses on the structured and deliberate nature of the ascent with stops, making this option the most accurate representation of the practice.**

## 3. Should a healthy, pregnant patient with a COHgb of 15% be treated for carbon monoxide exposure?

**A. Yes**

**B. No**

**C. Only if symptoms are present**

**D. Only after consulting a specialist**

**Treating a healthy, pregnant patient with a carboxyhemoglobin (COHgb) level of 15% for carbon monoxide exposure is advisable due to several critical factors related to both maternal and fetal health. Carbon monoxide binds to hemoglobin more readily than oxygen, thereby reducing the oxygen-carrying capacity of blood. In pregnant patients, this is especially concerning, as it poses risks not only to the mother but also to the developing fetus, which relies on maternal blood for its oxygen supply. At a COHgb level of 15%, the risk of hypoxia is significant. Pregnant women are generally more susceptible to the adverse effects of carbon monoxide due to physiological changes such as increased blood volume and alterations in blood gas concentrations. Additionally, elevated levels of carboxyhemoglobin can lead to fetal hypoxia, which may result in neurological damage or developmental issues. The proactive approach in treating carbon monoxide exposure, especially at the threshold of 15% COHgb, is crucial in preventing these potential complications. Therefore, it is appropriate to initiate treatment regardless of the presence of symptoms, as some patients may not exhibit immediate signs of carbon monoxide poisoning, yet they can still be at risk.**

## 4. In what year did the first recorded use of pressure for respiratory problems occur?

**A. 1642**

**B. 1662**

**C. 1689**

**D. 1701**

**The first recorded use of pressure for respiratory problems occurred in 1662, marking a significant moment in the history of hyperbaric medicine. This year is notable as it aligns with the publication of the first documentation of the therapeutic use of increased atmospheric pressure to treat conditions such as "the King's Evil," which is associated with respiratory issues, among other ailments. Understanding this early application is important as it highlights the historical context in which hyperbaric treatments began to develop, setting the stage for the more advanced practices we see today. The other years listed did not have documented instances of such usage, which is why they do not hold the same significance in this context.**

## 5. What is the most common offending organism in gas gangrene?

**A. Staphylococcus aureus**

**B. Clostridium perfringens**

**C. Escherichia coli**

**D. Streptococcus pyogenes**

**Clostridium perfringens is recognized as the most common organism responsible for gas gangrene, primarily because it thrives in anaerobic (low-oxygen) environments and produces potent toxins that contribute to tissue necrosis. This bacterium can be found in soil and is often associated with deep wounds or surgical sites where oxygen is limited. The rapid growth of Clostridium perfringens in these settings leads to the release of gas and toxins, which result in the clinical features of gas gangrene, including severe pain, swelling, and the characteristic foul-smelling discharge. Understanding the pathogenic mechanisms of Clostridium perfringens is crucial for effective diagnosis and treatment of gas gangrene, highlighting its significance in this context.**

## 6. What term did Haldane use to describe tissue compartments that exchange nitrogen at different rates?

**A. Half-time tissues**

**B. Nitrogen compartments**

**C. Decompression zones**

**D. Gas exchange tissues**

**Haldane introduced the concept of "half-time tissues" to describe the various tissue compartments in the human body that eliminate nitrogen at different rates during decompression after exposure to increased pressures in a hyperbaric environment. Each tissue compartment has a unique time constant, which indicates how quickly nitrogen is absorbed and released. The term "half-time" refers to the time it takes for a particular tissue to reduce the nitrogen concentration by half during decompression, highlighting the differential kinetics of nitrogen loading and unloading across different tissue types. This terminology is essential in understanding the principles of safe decompression and the risks associated with decompression sickness. Proper knowledge of half-time tissues allows for the creation of decompression schedules that minimize the risk of bubbles forming in the bloodstream or tissues, which can lead to injury or sickness.**

## 7. What are common causes of a thermal burn?

**A. Open fire, steam, cold surfaces, hot gases**

**B. Open fire, steam, hot surfaces, hot liquids**

**C. Electric shock, sunlight, freezing temperatures, hot surfaces**

**D. Hot liquids, chemical exposure, freezing conditions, toxic gases**

**Common causes of thermal burns primarily involve exposure to high temperatures from various sources. When considering option B, it accurately includes open fire, steam, hot surfaces, and hot liquids as significant contributors to thermal burns. Open fire can lead to burns from direct contact with flames or from heat radiating from the fire. Steam, which is water vapor at high temperatures, can cause severe burns upon contact with skin, as it releases heat quickly. Hot surfaces, such as metal or glass that have been heated, can inflict burns if touched. Finally, hot liquids, commonly referred to as scalds, are a leading cause of thermal burns, especially in environments where boiling water or hot beverages are present. While the other choices may include elements that can cause harm or injury, they do not all align with the primary causes of thermal burns. For example, electric shock and chemical exposure are related to other types of injuries rather than thermal burns specifically. Thus, option B encompasses the most relevant and typical causes associated with thermal burns.**

## 8. Which body area may complicate TcOM data collections?

**A. Flat surface areas**

**B. Bony prominence**

**C. Muscular regions**

**D. Areas with hair**

**The correct choice highlights that bony prominence areas may complicate transcutaneous oxygen measurement (TcOM) data collections. This is because bony prominences can interfere with the placement and stability of the sensors used to measure oxygen levels. When the sensor is placed over a bony area, it may not make consistent contact with the skin or may experience variations in blood flow, which can lead to less reliable readings. In contrast, flat surface areas are typically uniform and provide a stable base for sensor application, while muscular regions generally have more blood flow, promoting better data collection. Areas with hair might present some minimal challenges due to interference with sensor attachment, but are generally not as significant as the issues posed by bony prominences in terms of reliability and accuracy of TcOM measurements.**

## 9. Which electrical voltage level is permissible in both monoplace and multiplace hyperbaric chambers?

**A. 15 volts**

**B. 28 volts**

**C. 40 volts**

**D. 55 volts**

**The permissible electrical voltage level for both monoplace and multiplace hyperbaric chambers is 28 volts. This specific voltage is chosen primarily for safety reasons. Hyperbaric environments involve increased atmospheric pressure, which can impact electrical systems. At higher voltages, there is a higher risk of arcing and short circuits, which could lead to fire hazards in the presence of a highly oxygen-rich atmosphere, typical in hyperbaric treatments. Therefore, maintaining a lower voltage, such as 28 volts, minimizes the risk while still allowing for adequate electrical operation of equipment used in these chambers. This voltage level strikes a balance between safety and functionality, making it the preferred choice in hyperbaric medicine.**

## 10. What is the primary purpose of the CGA guidelines regarding compressed gases?

**A. Safe handling of compressed gases**

**B. Regulation of gas prices**

**C. Designing new gas cylinders**

**D. Testing gas purity**

**The primary purpose of the CGA (Compressed Gas Association) guidelines is to ensure the safe handling of compressed gases. These guidelines are critical for protecting the health and safety of individuals who work with or are exposed to compressed gases, as well as for preventing accidents that could result from improper use or storage of these gases. Safe handling includes comprehensive protocols and practices for transportation, storage, and operation with compressed gas cylinders. This helps to mitigate risks such as explosions, leaks, and other hazards associated with high-pressure gas systems. While aspects like gas purity testing and gas cylinder design are important in the overall management and quality control of gases, they are not the primary focus of the CGA guidelines. The guidelines primarily address safety concerns to ensure that all handling procedures minimize risks associated with compressed gases.**