North Seattle College EMT Entrance Practice Exam (Sample)

Study Guide

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Questions

1. What does peripheral vascular resistance (PVR) refer to?

A. Opposition to blood flow through the vessels

B. Heart rate variability

C. Blood volume changes

D. Arterial compliance

2. What condition presents as yellow skin due to liver or gallbladder problems?

A. Mottling

B. Cyanosis

C. Jaundice

D. Flushed skin

3. Which skin condition is indicative of shock, hypothermia, or cardiac arrest?

A. Cyanosis

B. Mottling

C. Flushed skin

D. Jaundice

4. Which structure branches into the right and left primary bronchus?

A. Trachea

B. Epiglottis

C. Pleurae

D. Mediastinum

5. Which component of red blood cells is responsible for acquiring oxygen in the lungs?

A. Plasma

B. Hemoglobin

C. Myoglobin

D. Platelets

6. Which of the following vessels is NOT involved in transporting blood away from the heart?

- **A. Pulmonary arteries**
- **B. Aorta**
- **C. Superior vena cava**
- **D. Coronary arteries**

7. What is a severe allergic reaction that impacts multiple body systems called?

- **A. Anaphylaxis**
- **B. Shock**
- **C. Sepsis**
- **D. Allergic reaction**

8. What is the medical term for the partial or complete removal of an extremity due to trauma or circulatory disease?

- **A. Traction**
- **B. Amputation**
- **C. Resection**
- **D. Excision**

9. What does the term "position of function" refer to in medical context?

- **A. The optimal position for a limb at rest**
- **B. The position of maximum extension**
- **C. The position that causes pain**
- **D. The required position for surgery**

10. Who is more likely to experience air embolism?

- **A. Patients with skin burns**
- **B. Individuals with blunt force trauma**
- **C. Patients with torn blood vessels**
- **D. Individuals with chronic headaches**

Answers

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

Explanations

1. What does peripheral vascular resistance (PVR) refer to?

A. Opposition to blood flow through the vessels

B. Heart rate variability

C. Blood volume changes

D. Arterial compliance

Peripheral vascular resistance (PVR) specifically refers to the opposition to blood flow through the vessels, particularly the small blood vessels known as arterioles. This resistance is a critical factor in determining systemic blood pressure and blood flow distribution throughout the body. When vessels constrict, resistance increases, leading to more force required by the heart to pump blood, whereas dilation reduces resistance, allowing blood to flow more easily. Understanding PVR is essential because it reflects the condition of the vascular system and can provide insights into cardiovascular health. For instance, conditions such as hypertension (high blood pressure) can arise from increased peripheral vascular resistance. Thus, it plays a significant role in understanding overall cardiovascular function and pathology.

2. What condition presents as yellow skin due to liver or gallbladder problems?

A. Mottling

B. Cyanosis

C. Jaundice

D. Flushed skin

Jaundice is characterized by the yellow discoloration of the skin and the whites of the eyes, often resulting from an accumulation of bilirubin in the bloodstream. This condition typically indicates underlying issues related to the liver or gallbladder, such as hepatitis, cirrhosis, or bile duct obstruction. The liver is responsible for metabolizing bilirubin, which is produced from the breakdown of red blood cells. When liver function is impaired, bilirubin levels can rise, leading to the noticeable yellowing. Understanding jaundice helps healthcare professionals identify serious health conditions early, which is crucial for effective treatment. In contrast, mottling refers to a blotchy discoloration of the skin often associated with poor circulation, cyanosis denotes a bluish color indicative of low oxygen levels in blood, and flushed skin typically appears red due to increased blood flow, often from exertion or emotional responses. Each of these conditions indicates different physiological issues unrelated to liver or gallbladder function, distinguishing them clearly from jaundice.

3. Which skin condition is indicative of shock, hypothermia, or cardiac arrest?

A. Cyanosis

B. Mottling

C. Flushed skin

D. Jaundice

The condition that signifies shock, hypothermia, or cardiac arrest is mottling. Mottling occurs when blood flow is reduced to the skin due to decreased circulation, often seen in patients who are critically ill or experiencing severe trauma. In these situations, the skin may appear pale or blotchy, with areas of discoloration that reflect the inadequate perfusion of blood to the tissues. In contrast, cyanosis, while also indicative of poor oxygenation, is primarily characterized by a bluish discoloration of the skin, particularly around the lips and extremities. It is more specifically associated with respiratory distress or low oxygen levels rather than the broader spectrum of shock or cardiac issues. Flushed skin typically indicates increased blood flow to the surface of the skin, often seen in conditions such as fever or exertion, and does not suggest decreased perfusion. Jaundice reflects liver dysfunction and results in a yellowing of the skin and eyes due to increased bilirubin levels, which is unrelated to conditions like shock or cardiac arrest. Thus, mottling serves as a crucial clinical sign, reflecting the body's response to severe physiological stress.

4. Which structure branches into the right and left primary bronchus?

A. Trachea

B. Epiglottis

C. Pleurae

D. Mediastinum

The structure that branches into the right and left primary bronchus is the trachea. The trachea, also known as the windpipe, is a vital part of the respiratory system that extends from the larynx and serves as the passageway for air to enter the lungs. At a certain point, typically around the level of the fifth thoracic vertebra, the trachea bifurcates into two main bronchi: the right primary bronchus, which leads to the right lung, and the left primary bronchus, which leads to the left lung. This branching is crucial as it allows for the distribution of air to both lungs, facilitating the process of respiration. The other options do not serve this function. The epiglottis is a flap-like structure that covers the trachea during swallowing to prevent food from entering the airway, while the pleurae are membranes that surround the lungs and line the chest cavity, playing a role in protecting the lungs and allowing for expansion and contraction during breathing. The mediastinum is the central compartment of the thoracic cavity that contains various structures, including the heart, trachea, esophagus, and major blood vessels, but it does not branch into the primary bronchi

5. Which component of red blood cells is responsible for acquiring oxygen in the lungs?

A. Plasma

B. Hemoglobin

C. Myoglobin

D. Platelets

Hemoglobin is the component of red blood cells responsible for acquiring oxygen in the lungs. It is a protein that binds to oxygen molecules as blood passes through the lung's alveoli, effectively transporting oxygen from the lungs to the rest of the body. Hemoglobin's structure allows it to bind oxygen in areas of high concentration, like the lungs, and release it in areas where it is less concentrated, such as the tissues. This function is critical for maintaining the body's oxygen supply and supporting cellular metabolism. In contrast, plasma is the liquid component of blood that carries cells, nutrients, hormones, and waste products but does not have a role in oxygen transport itself. Myoglobin, while also a protein that binds oxygen, is found in muscle tissue rather than in red blood cells and is primarily responsible for storing oxygen for use during muscle contraction rather than for transport. Lastly, platelets are involved in blood clotting and do not have any role in oxygen transport. Each of these components plays distinct roles in the body, but hemoglobin is specifically crucial for oxygen acquisition and transport.

6. Which of the following vessels is NOT involved in transporting blood away from the heart?

A. Pulmonary arteries

B. Aorta

C. Superior vena cava

D. Coronary arteries

The superior vena cava is a large vein that carries deoxygenated blood from the upper body to the right atrium of the heart. It plays a critical role in the circulatory system by returning blood to the heart rather than transporting it away from it. In contrast, the pulmonary arteries, aorta, and coronary arteries all have functions involving the distribution of oxygen-rich blood (or in the case of pulmonary arteries, deoxygenated blood to the lungs) away from the heart. The pulmonary arteries transport blood from the right ventricle to the lungs for oxygenation, the aorta carries oxygenated blood from the left ventricle to the rest of the body, and the coronary arteries provide blood to the heart muscle itself. Thus, the superior vena cava stands out as the vessel not involved in transporting blood away from the heart.

7. What is a severe allergic reaction that impacts multiple body systems called?

A. Anaphylaxis

B. Shock

C. Sepsis

D. Allergic reaction

A severe allergic reaction that impacts multiple body systems is called anaphylaxis. This condition is characterized by the rapid onset of symptoms that can involve various organ systems, including the respiratory, cardiovascular, and gastrointestinal systems. The body's immune response is triggered in a dramatic way, causing widespread release of chemicals such as histamine that lead to symptoms like difficulty breathing, swelling, hives, a drop in blood pressure, and in severe cases, can result in loss of consciousness or even death if not treated promptly. Anaphylaxis is typically a life-threatening situation that requires immediate medical intervention, often with the administration of epinephrine to counteract the severe reaction. Other options such as shock, sepsis, or general allergic reactions do not specifically describe the multi-system involvement and rapid progression characteristic of anaphylaxis. Shock may refer to a state of inadequate blood flow that can result from various causes, while sepsis is a systemic infection response, and an allergic reaction could be a milder form not involving multiple systems or not requiring emergency treatment. Therefore, the term anaphylaxis captures the critical nature and systemic involvement of this severe allergic response.

8. What is the medical term for the partial or complete removal of an extremity due to trauma or circulatory disease?

A. Traction

B. Amputation

C. Resection

D. Excision

The medical term for the partial or complete removal of an extremity due to trauma or circulatory disease is "amputation." This term specifically refers to the surgical or traumatic removal of a limb or part of a limb. Amputation can be necessitated by various factors, including severe injuries, infections, or diseases such as peripheral artery disease, where blood supply to the extremity is inadequate, leading to tissue death. This makes amputation a critical procedure to preserve the patient's life or health. In contrast, the other terms—traction, resection, and excision—do not accurately describe this specific procedure. Traction refers to a method used to align broken bones or relieve pressure on the spine, while resection generally pertains to the surgical removal of a part of an organ or tissue (but not necessarily an extremity). Excision is a broader term that means to cut out or remove tissue but does not specifically indicate the removal of a limb. Therefore, "amputation" is the precise term used within medical terminology for the removal of extremities.

9. What does the term "position of function" refer to in medical context?

A. The optimal position for a limb at rest

B. The position of maximum extension

C. The position that causes pain

D. The required position for surgery

The term "position of function" in a medical context refers to the optimal position for a limb at rest. This is significant because maintaining a limb in its position of function helps prevent stiffness, contractures, and facilitates better blood circulation and healing. For example, the position of function for the hand involves the fingers being slightly flexed and the wrist being in a neutral position; this allows for potential movement and helps preserve the integrity of the joints and soft tissues. In comparing this to other potential interpretations—while maximum extension might seem beneficial in some contexts, it can actually lead to injury or discomfort over prolonged periods. A position that causes pain would not be ideal for patient care, as comfort is key in recovery and rehabilitation. Finally, while certain surgical procedures may require specific positions, the "position of function" is focused more on everyday positioning for maintenance of health rather than any surgical necessity.

10. Who is more likely to experience air embolism?

A. Patients with skin burns

B. Individuals with blunt force trauma

C. Patients with torn blood vessels

D. Individuals with chronic headaches

Air embolism occurs when air bubbles enter the bloodstream, which can lead to serious complications like stroke or cardiac arrest. Individuals with torn blood vessels are particularly at risk because the trauma can create a pathway for air to enter the vascular system. When blood vessels are torn, especially in situations involving significant trauma, there's a greater chance for atmospheric pressure to push air into the circulatory system. This phenomenon is commonly observed in medical scenarios involving deep lacerations or vascular injuries where air is introduced as a result of the injury. In contrast, patients with skin burns typically do not have an open vascular system that would allow air to enter the bloodstream. Blunt force trauma could potentially cause vascular injuries, but it is less directly related to air embolism than torn blood vessels. Chronic headaches do not present any direct risk for air embolism, as they are usually not associated with trauma or disruption to the vascular integrity. Thus, among these groups, individuals with torn blood vessels are the most likely to experience air embolism due to the direct relationship between their injury and the possibility of air entering the vascular system.