EKG National Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Questions

1. What position should the patient be in when obtaining an EKG?

A. Sitting upright

B. Supine

C. Standing

D. Lying on the side

2. How is oxygenated blood returned to the heart?

A. By the aorta

B. Through the pulmonary veins

C. Via the superior vena cava

D. Through the coronary arteries

3. Which two chambers are known as the "receiving" chambers of the heart?

A. The right and left ventricles

B. The right and left atria

C. The aorta and pulmonary artery

D. The superior and inferior vena cavae

4. In what position should a patient be placed when obtaining a 12-lead ECG?

A. Seated

B. Supine

C. Standing

D. Side-lying

5. Which chambers of the heart are known as the receiving chambers?

A. Right and left ventricles

B. Right and left atria

C. Pulmonary and aortic valves

D. Coronary arteries

6. What is the heart's diastolic phase characterized by?

- **A. Filling of the heart chambers**
- **B. Emptying of the heart chambers**
- **C. Contraction of the heart muscle**
- **D. Relaxation of the heart valves**

7. Where does the U-wave appear on an EKG?

- **A. Before the P wave**
- **B. After the T wave**
- **C. During the QRS complex**
- **D. Around the PR interval**

8. What type of wave is represented by an upward deflection in the QRS complex?

- **A. Q wave**
- **B. R wave**
- **C. S wave**
- **D. T wave**

9. What does the QRS complex indicate in an EKG?

- **A. Atrial contraction**
- **B. Ventricular depolarization**
- **C. Ventricular repolarization**
- **D. Heart rate**

10. What is the inner layer of the heart called?

- **A. Epicardium**
- **B. Pericardium**
- **C. Endocardium**
- **D. Myocardium**

Answers

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

Explanations

1. What position should the patient be in when obtaining an EKG?

A. Sitting upright

B. Supine

C. Standing

D. Lying on the side

The supine position, where the patient lies flat on their back, is optimal for obtaining an EKG. This position allows for easy access to the chest, ensuring proper placement of the electrodes for accurate readings. In this position, the heart is in a consistent orientation relative to the leads, which can lead to more reliable data and less interference caused by movement or body position changes. When a patient is supine, there is also a decreased risk of the electrodes being misplaced due to body movements or shifting, which can happen if the patient is sitting, standing, or lying on their side. Sitting upright can sometimes affect heart dimensions and lead placements, while standing or lying on the side could introduce variability in the EKG results due to body positioning. Thus, the supine position is the standard practice for optimal EKG recording.

2. How is oxygenated blood returned to the heart?

A. By the aorta

B. Through the pulmonary veins

C. Via the superior vena cava

D. Through the coronary arteries

Oxygenated blood is returned to the heart through the pulmonary veins. After the blood has been oxygenated in the lungs, it flows back to the left atrium of the heart via these veins. This process is crucial for maintaining the circulation of blood; it allows the heart to receive oxygen-rich blood before it is pumped out to the rest of the body through the aorta. The pulmonary veins are unique in that they are the only veins in the body that carry oxygenated blood. This function is essential for efficient circulation, as it directly contrasts with the role of other blood vessels like the superior vena cava, which returns deoxygenated blood from the body to the heart. Meanwhile, the aorta is responsible for distributing oxygenated blood to the body, and the coronary arteries supply blood to the heart muscle itself, ensuring its proper function. Understanding the pathway of blood flow is key to comprehending how the cardiovascular system operates as a whole.

3. Which two chambers are known as the "receiving" chambers of the heart?

A. The right and left ventricles

B. The right and left atria

C. The aorta and pulmonary artery

D. The superior and inferior vena cavae

The right and left atria are referred to as the "receiving" chambers of the heart because they are responsible for collecting blood that returns to the heart from the body and the lungs. The right atrium receives deoxygenated blood from the body via the superior and inferior vena cavae, while the left atrium collects oxygenated blood from the lungs through the pulmonary veins. This distinction is important because, after the atria fill with blood, they contract to push blood into the ventricles, which are the "pumping" chambers of the heart. Understanding the function and role of the atria is crucial for comprehending cardiac physiology and the overall circulation of blood within the body.

4. In what position should a patient be placed when obtaining a 12-lead ECG?

A. Seated

B. Supine

C. Standing

D. Side-lying

The appropriate position for a patient when obtaining a 12-lead ECG is supine. This position ensures that the patient's heart is at the same level as the electrodes being placed, minimizing any movement or tension in the chest area which could affect the accuracy of the readings. Being supine allows for better anatomical placement of the leads on the chest wall, ensuring a clearer and more accurate representation of the cardiac electrical activity. When the patient is supine, there is also less chance of external influences such as gravity affecting the position of the leads, which could happen if the patient were seated or standing. Additionally, this position is generally more comfortable for the patient, facilitating better cooperation during the procedure. In contrast, being seated could introduce variability in lead placement and could cause the patient to inadvertently shift or move, impacting the ECG quality. A standing position poses similar issues, as the heart's electrical potentials may not be accurately captured. The side-lying position, while it may be suitable for certain clinical scenarios, is generally not recommended for 12-lead ECGs due to potential distortion of the ECG signal resulting from changes in lead placement.

5. Which chambers of the heart are known as the receiving chambers?

A. Right and left ventricles

B. Right and left atria

C. Pulmonary and aortic valves

D. Coronary arteries

The right and left atria are known as the receiving chambers of the heart because their primary role is to receive blood returning to the heart from the body and the lungs. The right atrium collects deoxygenated blood from the body through the superior and inferior vena cavae, while the left atrium gathers oxygenated blood from the lungs via the pulmonary veins. This function is critical in maintaining proper blood flow through the heart, as the atria fill with blood prior to contracting and sending it into the ventricles, which then pump blood out to the lungs and the rest of the body. In contrast, the right and left ventricles are the pumping chambers of the heart, responsible for ejecting blood. The pulmonary and aortic valves are not chambers; they are structures that control blood flow out of the heart. Similarly, the coronary arteries are blood vessels that supply the heart muscle itself with oxygen-rich blood, rather than being chambers that receive blood. Understanding the specific roles of each chamber and structure is crucial for grasping the overall function of the cardiovascular system.

6. What is the heart's diastolic phase characterized by?

A. Filling of the heart chambers

B. Emptying of the heart chambers

C. Contraction of the heart muscle

D. Relaxation of the heart valves

The diastolic phase of the heart is primarily characterized by the filling of the heart chambers. During this phase, the heart muscle relaxes, allowing the atria and ventricles to fill with blood. Blood flows from the veins into the atria, and as the atria contract at the end of diastole, blood is pushed into the ventricles. This filling is essential for ensuring that there is an adequate volume of blood available for the next contraction, which takes place in the systolic phase. While relaxation of the heart muscle does occur during diastole, the defining characteristic is really about the filling process itself. The heart valves also play a role in this phase, ensuring that blood moves in the correct direction, but they do not relax per se in the context of this specific term. Understanding diastole as a critical time for filling aligns well with the heart's overall function in the cardiac cycle.

7. Where does the U-wave appear on an EKG?

A. Before the P wave

B. After the T wave

C. During the QRS complex

D. Around the PR interval

The U-wave appears after the T wave on an EKG. This feature is considered a normal variant and is thought to represent the repolarization of the papillary muscles or the Purkinje fibers in the heart. Typically, the T wave corresponds to the repolarization of the ventricles, and the U wave follows it, indicating a continuation of the repolarization process. In clinical practice, the presence, morphology, and size of the U wave can provide additional diagnostic information, especially in conditions such as hypokalemia or certain cardiac diseases. Recognizing and locating the U wave in relation to the T wave is important for interpreting EKGs accurately.

8. What type of wave is represented by an upward deflection in the QRS complex?

A. Q wave

B. R wave

C. S wave

D. T wave

An upward deflection in the QRS complex is identified as the R wave. In the context of the QRS complex, the R wave specifically represents the depolarization of the ventricles, which is a crucial part of the heart's electrical activity during a heartbeat. This depolarization triggers the ventricles to contract, pumping blood out of the heart. The upward deflection signifies that the electrical impulse is traveling through the ventricular muscle. The QRS complex consists of the Q wave, R wave, and S wave. The Q wave is typically the first negative deflection preceding the R wave, and the S wave is the subsequent negative deflection following the R wave. The T wave, while part of the overall ECG tracing, pertains to the repolarization phase of the ventricles and is not part of the QRS complex. Therefore, recognizing the R wave as the upward part of the QRS is integral in interpreting EKG readings and understanding the electrical activity of the heart.

9. What does the QRS complex indicate in an EKG?

A. Atrial contraction

B. Ventricular depolarization

C. Ventricular repolarization

D. Heart rate

The QRS complex on an EKG represents ventricular depolarization, which is the electrical activity that triggers the ventricles to contract and pump blood out of the heart. This complex is formed during the electrical conduction process when impulses travel through the bundle of His, bundle branches, and Purkinje fibers, leading to the activation of the ventricular myocardium. Understanding this concept is vital because ventricular depolarization is a key aspect of the heart's function; it directly correlates with the contraction of the ventricles, moving blood into the pulmonary and systemic circuits. The width and morphology of the QRS complex can also provide important clinical information about the heart's electrical conduction pathways and overall health. Recognizing that the QRS complex does not indicate atrial contraction, ventricular repolarization, or heart rate is essential. Atrial contraction corresponds to the P wave, while ventricular repolarization is reflected in the T wave. Heart rate can be inferred from the frequency of the QRS complexes but is not represented by the QRS complex itself. Therefore, the role of the QRS complex in indicating ventricular depolarization is both crucial and definitive in interpreting EKGs.

10. What is the inner layer of the heart called?

A. Epicardium

B. Pericardium

C. Endocardium

D. Myocardium

The inner layer of the heart is called the endocardium. This layer is composed of a thin membrane made up of endothelial cells that line the heart's chambers and cover the heart valves. The endocardium plays a crucial role in providing a smooth surface for blood to flow within the heart and helps to prevent blood clot formation. It also facilitates the functioning of the heart valves, ensuring that they open and close properly. In contrast, the epicardium is the outer layer of the heart; the pericardium is a protective fibrous sac surrounding the heart; and the myocardium is the thick muscular middle layer responsible for the contraction and pumping action of the heart. These layers work together to maintain the heart's structure and function, but it is the endocardium that specifically lines the inner surfaces.