

MedCa Electrocardiogram (EKG) Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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SAMPLE

Questions

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- 1. What are the normal duration limits for the QRS complex?**
 - A. 0.04 to 0.06 seconds**
 - B. 0.06 to 0.10 seconds**
 - C. 0.10 to 0.14 seconds**
 - D. 0.14 to 0.20 seconds**
- 2. What does the presence of Q waves in an EKG indicate?**
 - A. Normal heart function**
 - B. Myocardial infarction**
 - C. Atrial enlargement**
 - D. Left bundle branch block**
- 3. Which condition is indicated by a delta wave in an EKG?**
 - A. Wolff-Parkinson-White syndrome**
 - B. Atrial fibrillation**
 - C. Normal variant**
 - D. Myocardial infarction**
- 4. What do biphasic T waves in the context of ischemia generally indicate?**
 - A. Myocardial ischemia**
 - B. Arrhythmia**
 - C. Dehydration**
 - D. Heart valve abnormalities**
- 5. What is the most common form of supraventricular tachycardia?**
 - A. Wolff-Parkinson-White syndrome**
 - B. Atrioventricular nodal reentrant tachycardia (AVRT)**
 - C. Atrial flutter**
 - D. Paroxysmal atrial tachycardia**
- 6. What is the primary purpose of an electrode in an ECG?**
 - A. To amplify the heartbeats**
 - B. To convert electrical impulses into mechanical signals**
 - C. To pick up electrical impulses given off by the heart**
 - D. To generate electric shocks**

- 7. What does the term "axis" refer to in an EKG?**
- A. The electrical resistance of the heart**
 - B. The rate of heart contractions**
 - C. The direction of the heart's electrical activity as detected by the leads**
 - D. The amplitude of the cardiac signals**
- 8. True or False: An ECG can be used to determine blood pressure.**
- A. True**
 - B. False**
 - C. Partially True**
 - D. Depends on the machine**
- 9. What does a prolonged QT interval indicate?**
- A. Increased risk of arrhythmias**
 - B. Normal heart rhythm**
 - C. Enhanced myocardial oxygen demand**
 - D. Stable angina**
- 10. What is the term for the part of the EKG that measures heart muscle contraction?**
- A. PR interval**
 - B. QRS complex**
 - C. ST segment**
 - D. P wave**

Answers

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

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Explanations

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1. What are the normal duration limits for the QRS complex?

- A. 0.04 to 0.06 seconds
- B. 0.06 to 0.10 seconds**
- C. 0.10 to 0.14 seconds
- D. 0.14 to 0.20 seconds

The normal duration of the QRS complex is critical for assessing cardiac function, as it represents the time taken for the ventricles to depolarize. For a normal QRS complex, the standard duration limit ranges from 0.06 to 0.10 seconds. This range indicates that the electrical impulse is conducted efficiently from the atria through the ventricles, allowing for an effective contraction. When the QRS duration is less than 0.06 seconds, it typically indicates a very rapid conduction system that is common in normal hearts or may signal other rapid conduction pathways. Conversely, durations exceeding 0.10 seconds can suggest a delay in conduction, which may be due to conditions such as a bundle branch block or other forms of intraventricular conduction delay. Understanding and identifying the normal QRS duration is crucial for recognizing abnormal patterns that may require further investigation.

2. What does the presence of Q waves in an EKG indicate?

- A. Normal heart function
- B. Myocardial infarction**
- C. Atrial enlargement
- D. Left bundle branch block

The presence of Q waves in an EKG is significant because it indicates the possibility of a myocardial infarction, commonly known as a heart attack. When a myocardial infarction occurs, it can cause damage to the heart muscle, which alters the electrical conduction pathways. As a result, abnormal Q waves may develop on the EKG tracing. These Q waves are typically seen in the leads that are closest to the area of the heart that has suffered damage, indicating that a previous myocardial infarction has taken place. This is particularly pertinent when the Q waves are deep and wide, as they suggest the infarction was of sufficient severity to impact the heart's electrical activity significantly. In contrast to the other potential conditions listed, such as normal heart function, atrial enlargement, or left bundle branch block, Q waves are specifically associated with previous injury to the heart muscle. Normal heart function would not present with abnormal Q waves, atrial enlargement is indicated by changes in the P wave, and left bundle branch block would manifest with characteristic changes in the QRS complex but not typically with Q waves that indicate prior myocardial damage.

3. Which condition is indicated by a delta wave in an EKG?

A. Wolff-Parkinson-White syndrome

B. Atrial fibrillation

C. Normal variant

D. Myocardial infarction

A delta wave on an electrocardiogram (EKG) is a distinctive feature associated with Wolff-Parkinson-White syndrome (WPW). This condition arises due to an accessory pathway that allows electrical signals to bypass the normal conduction route, leading to pre-excitation of the ventricles. The delta wave appears as a slurred upstroke of the QRS complex, indicating that the ventricles are activated earlier than usual due to this abnormal conduction pathway. Understanding why this is specific to WPW is essential. In WPW, the presence of the delta wave signifies that there is an extra conduction pathway (known as the Bundle of Kent) that connects the atria and ventricles, causing a premature depolarization of the ventricles. This is in contrast to other conditions such as atrial fibrillation, which does not involve the same pre-excitation phenomena, or myocardial infarction, which typically manifests with ST segment changes or abnormal Q waves rather than delta waves. A normal variant does not present any abnormal conduction pathways like WPW does. Thus, the delta wave is a hallmark of Wolff-Parkinson-White syndrome, making it the correct association in this EKG context.

4. What do biphasic T waves in the context of ischemia generally indicate?

A. Myocardial ischemia

B. Arrhythmia

C. Dehydration

D. Heart valve abnormalities

Biphasic T waves are most commonly associated with myocardial ischemia, which refers to reduced blood flow to the heart muscle. When the heart muscle does not receive sufficient oxygen, it can alter the electrical activity as detected by an electrocardiogram (EKG). In this context, T waves may exhibit a biphasic pattern, reflecting the impaired repolarization of the myocardial cells. This biphasic morphology of the T wave indicates changes in the repolarization phase of the cardiac cycle. Instead of a singular, upright T wave, which is typical in healthy hearts, the presence of both positive and negative deflections in the T wave suggests areas of myocardial injury or stress, often due to ischemia. Therefore, the identification of biphasic T waves can serve as a diagnostic clue, urging further evaluation of ischemic cardiovascular events. In terms of other choices, while arrhythmias, dehydration, and heart valve abnormalities can also produce changes in the EKG, they are less specifically linked to the biphasic T wave phenomenon compared to myocardial ischemia. Understanding the relationship between ischemia and the EKG findings is crucial for diagnosing and managing potential cardiac issues effectively.

5. What is the most common form of supraventricular tachycardia?

- A. Wolff-Parkinson-White syndrome**
- B. Atrioventricular nodal reentrant tachycardia (AVRT)**
- C. Atrial flutter**
- D. Paroxysmal atrial tachycardia**

Atrioventricular nodal reentrant tachycardia (AVRT) is widely recognized as the most common form of supraventricular tachycardia (SVT). AVRT primarily arises from a reentrant circuit that includes the atrioventricular (AV) node, which plays a crucial role in the electrical conduction system of the heart. This condition is characterized by episodes of rapid heartbeats that can occur suddenly and often resolve spontaneously. The frequency of AVRT is primarily due to its physiological mechanism and the specific conduction pathways involved. In many cases, it is associated with a reentrant loop that creates an electrical circuit involving both the atria and ventricles, allowing for rapid heart rates that can exceed 150 beats per minute. This makes it a prevalent form of SVT, particularly among younger individuals. While other forms of supraventricular tachycardia, such as atrial flutter, paroxysmal atrial tachycardia, and conditions like Wolff-Parkinson-White syndrome, certainly exist and can occur with notable frequency, they do not match AVRT in terms of prevalence. Atrial flutter generally has a more distinct rhythm and often requires different management strategies. Paroxysmal atrial

6. What is the primary purpose of an electrode in an ECG?

- A. To amplify the heartbeats**
- B. To convert electrical impulses into mechanical signals**
- C. To pick up electrical impulses given off by the heart**
- D. To generate electric shocks**

The primary purpose of an electrode in an ECG is to pick up electrical impulses given off by the heart. During each heartbeat, the heart generates electrical signals that initiate contraction and relaxation of the heart muscles. Electrodes placed on the skin detect these tiny electrical changes and convert them into a readable electrical signal, which is then recorded as an electrocardiogram. By capturing the heart's electrical activity, electrodes enable healthcare providers to analyze its rhythm, detect abnormalities, and diagnose various cardiac conditions. This non-invasive method is essential for monitoring the heart's health and functioning, making it a cornerstone of cardiovascular diagnostics. The successful interpretation of an ECG relies heavily on the accurate placement and function of these electrodes.

7. What does the term "axis" refer to in an EKG?

- A. The electrical resistance of the heart**
- B. The rate of heart contractions**
- C. The direction of the heart's electrical activity as detected by the leads**
- D. The amplitude of the cardiac signals**

In the context of an EKG, the term "axis" specifically refers to the direction of the heart's electrical activity as detected by the leads placed on the body. This electrical activity is a result of depolarization and repolarization of the heart muscle, which can be represented graphically on the EKG. The axis can help clinicians assess the heart's orientation in the chest and can provide vital information about the heart's electrical conduction system, including any deviations that may suggest underlying pathologies, such as hypertrophy or ischemia. Determining the cardiac axis is typically done through analysis of the QRS complexes in leads such as lead I and lead aVF, allowing for an understanding of how electrical impulses are propagating through the heart. Understanding the axis is crucial for diagnosing various cardiac conditions, interpreting EKG findings accurately, and aiding in effective patient management.

8. True or False: An ECG can be used to determine blood pressure.

- A. True**
- B. False**
- C. Partially True**
- D. Depends on the machine**

An electrocardiogram (ECG) records the electrical activity of the heart and is primarily used to assess heart rhythm, heart size, and the presence of conditions such as ischemia or myocardial infarction. While it provides critical information about the heart's functioning and can help detect various cardiac abnormalities, it does not measure blood pressure directly. Blood pressure refers to the force exerted by circulating blood on the walls of blood vessels and is determined using a sphygmomanometer or other specialized devices designed to measure the pressure in arteries. The ECG does not provide this type of mechanical measurement. Therefore, stating that an ECG can be used to determine blood pressure is not accurate, solidifying the rationale for the answer being false. Understanding the distinct functions of these two assessments is crucial for effective clinical evaluation.

9. What does a prolonged QT interval indicate?

- A. Increased risk of arrhythmias**
- B. Normal heart rhythm**
- C. Enhanced myocardial oxygen demand**
- D. Stable angina**

A prolonged QT interval is significant in the context of cardiac health because it indicates an increased risk of arrhythmias. The QT interval represents the time it takes for the heart's electrical system to reset after each heartbeat, particularly relating to the repolarization phase of the cardiac cycle. When this interval is extended, it suggests that there may be disruptions in the normal electrical activity of the heart, potentially leading to dangerous arrhythmias, such as Torsades de Pointes or other types of ventricular tachycardia. Monitoring the QT interval is essential in various clinical settings, particularly in patients taking medications that are known to prolong QT or in those with specific medical conditions that may predispose them to this issue. Thus, a prolonged QT is a critical parameter that healthcare providers assess to manage patient care effectively, especially in terms of preventing life-threatening cardiac events. In contrast, normal heart rhythm would not be associated with a prolonged QT interval; rather, it would typically reflect a stable cardiac electrical conduction. Enhanced myocardial oxygen demand and stable angina also relate more to the heart's workload and blood supply rather than the electrical conduction system indicated by the QT interval.

10. What is the term for the part of the EKG that measures heart muscle contraction?

- A. PR interval**
- B. QRS complex**
- C. ST segment**
- D. P wave**

The portion of the EKG that measures heart muscle contraction is known as the QRS complex. This complex reflects the depolarization of the ventricles, which leads to ventricular contraction and is a critical component of the cardiac cycle. During this phase, the electrical signal that originates in the atria moves through the bundle of His and the Purkinje fibers, resulting in the simultaneous contraction of both ventricles. Understanding the function of the QRS complex is essential for diagnosing various cardiac conditions. Abnormalities in the QRS complex can indicate issues such as ventricular hypertrophy, bundle branch blocks, or other forms of ventricular dysfunction. The timing and morphology of this complex can reveal a great deal about the electrical conduction system of the heart and the overall health of the myocardium. In contrast, the PR interval measures the time it takes for the electrical impulse to travel from the atria to the ventricles, the ST segment indicates the period between ventricular depolarization and repolarization, and the P wave represents atrial depolarization. Each of these components serves a specific function, but it is the QRS complex that primarily corresponds to the contraction of the heart muscle.