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Questions

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- 1. What is the definition of sinus arrhythmia?**
 - A. A dangerous heart condition**
 - B. A variation in heart rate during the breathing cycle**
 - C. A result of electrical malfunction**
 - D. A type of heart block**
- 2. At what percentage of their target heart rate can stress tests be stopped?**
 - A. 75%-90%**
 - B. 85%-95%**
 - C. 85%-100%**
 - D. 90%-100%**
- 3. What is the role of rhythm strips in EKG technology?**
 - A. To provide permanent records of all EKGs**
 - B. To monitor heart's rhythm over a brief period**
 - C. To analyze biochemistry of the heart**
 - D. To measure blood pressure during heartbeats**
- 4. Which lead placement is essential for obtaining a comprehensive view of the heart's electrical activity?**
 - A. Lead VI**
 - B. Lead LI**
 - C. Lead V9**
 - D. Lead RL**
- 5. What is the significance of the QT interval?**
 - A. It represents the time for atrial depolarization**
 - B. It indicates electrocardiographic artifact duration**
 - C. It represents the total time for ventricular depolarization and repolarization**
 - D. It measures heart rate variability**

- 6. What method is considered most accurate for an EKG technician to measure a patient's body temperature?**
- A. Rectal**
 - B. Aural**
 - C. Temporal**
 - D. Oral**
- 7. What does ST elevation often indicate when observed on an EKG?**
- A. Heart valve disease**
 - B. Myocardial infarction**
 - C. Benign early repolarization**
 - D. Pulmonary embolism**
- 8. Where is the V1 electrode typically placed on a standard EKG?**
- A. On the right shoulder**
 - B. Mid-clavicular line, first intercostal space**
 - C. Left sternal border, fourth intercostal space**
 - D. In the center of the chest**
- 9. What does the "PP interval" on an EKG measure?**
- A. The time between systole and diastole**
 - B. The time between consecutive P waves**
 - C. The overall heart rate**
 - D. The duration of the PR interval**
- 10. Which of the following is a common cause of artifacts in an EKG reading?**
- A. Increased heart rate**
 - B. Patient movement**
 - C. Hyperkalemia**
 - D. Higher blood pressure**

Answers

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

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Explanations

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1. What is the definition of sinus arrhythmia?

- A. A dangerous heart condition**
- B. A variation in heart rate during the breathing cycle**
- C. A result of electrical malfunction**
- D. A type of heart block**

Sinus arrhythmia refers specifically to a variation in heart rate that occurs during the breathing cycle. This physiological phenomenon is typically characterized by an increase in heart rate during inhalation and a decrease during exhalation. It is most commonly observed in children and young adults, and it often reflects a normal variation associated with autonomic nervous system activity. Since it occurs due to the influence of breathing on heart dynamics, this makes it a normal response rather than a pathological condition, distinguishing it from conditions like dangerous heart conditions or electrical malfunctions. Sinus arrhythmia is often considered a benign variation and can be a normal finding on an EKG, particularly in healthy individuals.

2. At what percentage of their target heart rate can stress tests be stopped?

- A. 75%-90%**
- B. 85%-95%**
- C. 85%-100%**
- D. 90%-100%**

In the context of stress tests, they are typically conducted to evaluate a patient's cardiovascular response to exercise and can be stopped once the target heart rate is reached. The common guideline for terminating a stress test is at 85% of the patient's estimated maximum heart rate; however, under certain circumstances and types of tests, a target heart rate of up to 100% can be considered, especially when testing athletic individuals or in a controlled setting where the patient's health allows for it. Reaching up to 100% of maximum heart rate can provide important information about cardiovascular performance and the patient's ability to tolerate stress. Thus, the range of 85% to 100% encompasses a commonly accepted threshold for when to conclude a stress test, making it the correct choice. The other ranges, while they may seem relevant, do not fully align with the clinical guidelines for stress test termination, as they either fall short of the full potential maximum heart rate that may be safely assessed in select populations or suggest a narrower range that has less applicability in practical settings.

3. What is the role of rhythm strips in EKG technology?

- A. To provide permanent records of all EKGs
- B. To monitor heart's rhythm over a brief period**
- C. To analyze biochemistry of the heart
- D. To measure blood pressure during heartbeats

Rhythm strips play a crucial role in EKG technology by providing a continuous recording of the heart's electrical activity over a brief period. This allows for the observation and assessment of the heart's rhythm, identifying any irregularities such as arrhythmias, premature beats, or other abnormalities. The insight gained from rhythm strips is vital for healthcare professionals in diagnosing conditions and determining the appropriate clinical actions. The primary purpose of rhythm strips focuses on monitoring the heart's electrical impulses, making it an essential tool in the evaluation of cardiac health. In contrast, some of the other options like providing permanent records pertain more to full EKGs rather than rhythm strips, which are typically short and focused on rhythm monitoring. Analyzing biochemistry involves laboratory tests rather than electrophysiological assessments from EKGs, and measuring blood pressure is conducted via sphygmomanometers or other devices, rather than through the electrical activity recorded in EKG readings. This clarification highlights the specialized function of rhythm strips in the scope of cardiac monitoring.

4. Which lead placement is essential for obtaining a comprehensive view of the heart's electrical activity?

- A. Lead VI
- B. Lead LI
- C. Lead V9**
- D. Lead RL

The correct choice for obtaining a comprehensive view of the heart's electrical activity is Lead V9. This lead placement is considered essential because V9 is a part of the precordial leads that provide detailed information about the heart's anterior and lateral walls, as well as insights into the electrical activity from the right side of the heart. Placing electrodes in this position allows for a better assessment of the heart's overall function, detecting any abnormalities in rhythm or conduction. In contrast, other leads, such as V1 and V2, primarily focus on the right side of the heart and may not offer as complete a picture of cardiac activity compared to the comprehensive view provided by V9. Additionally, leads like L1 and RL are helpful but focus on different aspects of cardiovascular monitoring; however, they do not give the same thorough insight into the overall electrical patterns as V9. Thus, having V9 included in the lead placements is crucial for a more complete evaluation of the heart's electrical activity.

5. What is the significance of the QT interval?

- A. It represents the time for atrial depolarization**
- B. It indicates electrocardiographic artifact duration**
- C. It represents the total time for ventricular depolarization and repolarization**
- D. It measures heart rate variability**

The significance of the QT interval lies in its representation of the total time for ventricular depolarization and repolarization during a cardiac cycle. This interval is crucial for understanding how the ventricles of the heart are functioning. A prolonged QT interval can indicate potential risk for arrhythmias, as it suggests that the electrical activity in the ventricles is taking longer than normal, which can lead to dangerous conditions such as Torsades de Pointes or other forms of ventricular tachycardia. Monitoring the QT interval is vital, especially in patients who are on medications that might prolong this interval or in individuals with certain genetic predispositions to prolonged QT. Thus, understanding the QT interval allows healthcare professionals to assess the electrical stability of the heart and make informed decisions regarding patient management and potential interventions.

6. What method is considered most accurate for an EKG technician to measure a patient's body temperature?

- A. Rectal**
- B. Aural**
- C. Temporal**
- D. Oral**

The temporal method is widely recognized for its accuracy in measuring a patient's body temperature. This technique involves using a forehead thermometer that scans the temporal artery, which is located just beneath the skin. It provides a quick reading and is less invasive than rectal measurement. Temporal thermometers are also convenient for use in clinical settings, as they can provide results in just a few seconds and are suitable for patients of all ages. Compared to other methods, the temporal measurement can also account for external variables such as ambient temperature, offering a more reliable indication of core body temperature in situations where immediate results are essential. Additionally, this method is particularly useful for patients who may find other methods uncomfortable or unfeasible, thus enhancing patient compliance. While rectal temperature is often considered the gold standard in terms of accuracy, it is more invasive and can be uncomfortable, which may not make it the preferred choice in many scenarios. Aural measurements can be affected by external factors, like earwax, and oral readings may not always reflect core temperature accurately, especially if patients have difficulty with the measurement or have recently consumed hot or cold substances. Hence, the temporal method strikes a balance between accuracy, efficiency, and patient comfort.

7. What does ST elevation often indicate when observed on an EKG?

- A. Heart valve disease**
- B. Myocardial infarction**
- C. Benign early repolarization**
- D. Pulmonary embolism**

ST elevation observed on an EKG often indicates a myocardial infarction, commonly known as a heart attack. This finding is significant because it reflects acute injury to the heart muscle, typically caused by a blockage in one or more of the coronary arteries. When the tissue is not receiving enough oxygenated blood, it can lead to damage and changes in the electrical activity of the heart that can be visualized on an EKG as elevation in the ST segment. In the setting of a myocardial infarction, the elevation is usually localized to leads that correspond to the area of the heart that is affected, helping clinicians identify which part of the heart is experiencing the damage. This information is critical for making timely decisions about the necessary treatment, which may include more aggressive interventions such as angioplasty or thrombolytic therapy. The other options may lead to changes on an EKG, but they do not result in the specific pattern of ST elevation associated with myocardial infarction. For instance, heart valve disease typically presents with different findings, benign early repolarization is generally considered a normal variant, and pulmonary embolism usually shows other characteristic patterns on an EKG, such as S1Q3T3. Thus, ST elevation is a key indicator of myocardial infarction,

8. Where is the V1 electrode typically placed on a standard EKG?

- A. On the right shoulder**
- B. Mid-clavicular line, first intercostal space**
- C. Left sternal border, fourth intercostal space**
- D. In the center of the chest**

The V1 electrode is placed at the left sternal border in the fourth intercostal space. This location is crucial for capturing the electrical activity of the heart, particularly the right side of the heart and the septal regions. Proper placement of the V1 electrode allows for accurate detection of arrhythmias and other potential cardiac abnormalities. The placement at the left sternal border in the fourth intercostal space aligns with standard EKG protocol for monitoring heart functions effectively and ensuring that the EKG readings reflect the correct heart activity. This specific location helps healthcare professionals in making precise diagnoses based on the captured electrical signals from the heart.

9. What does the "PP interval" on an EKG measure?

- A. The time between systole and diastole
- B. The time between consecutive P waves**
- C. The overall heart rate
- D. The duration of the PR interval

The "PP interval" on an EKG specifically measures the time between consecutive P waves. This interval is particularly important for assessing the atrial rhythm and can help identify arrhythmias, such as atrial flutter or atrial fibrillation, where the P waves may become irregular. By measuring the PP interval, healthcare providers can determine the frequency of atrial contractions and evaluate the overall cardiac rhythm more accurately. Understanding the other choices adds clarity. The time between systole and diastole, for instance, relates to the cardiac cycle rather than the electrical activity represented by P waves. The overall heart rate is derived from the measurement of intervals like the RR interval or counting beats over time, but it does not specifically reflect the interval between P waves. Finally, the duration of the PR interval is separate from the PP interval; the PR interval encompasses the time from the beginning of the P wave to the beginning of the QRS complex, indicating the time taken for electrical impulses to travel through the AV node, not just the atrial activity represented by the P waves.

10. Which of the following is a common cause of artifacts in an EKG reading?

- A. Increased heart rate
- B. Patient movement**
- C. Hyperkalemia
- D. Higher blood pressure

Artifacts in an EKG reading typically arise from external interference or patient-related factors that disrupt the normal electrical activity being measured. Patient movement, which includes any unintentional movements such as shifting position, tensing muscles, or even breathing, can significantly affect the clarity of the EKG trace. These movements introduce noise and fluctuations in the baseline of the EKG waveform, leading to erroneous readings that can mimic or mask actual cardiac conditions. In contrast, while increased heart rate, hyperkalemia, and higher blood pressure are important physiological factors that can influence heart function and EKG appearance, they do not directly cause artifacts. Increased heart rate might change the EKG rhythm, and hyperkalemia can lead to characteristic changes in the EKG waveform but is not a source of artifacts. Similarly, higher blood pressure can affect cardiac workload and perfusion but is not a direct cause of baseline fluctuations or noise in the EKG signal.