

**Chapter 03: Sinus Mechanisms  
Test Bank**

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**MULTIPLE CHOICE**

1. In sinus arrhythmia, a gradual increasing of the heart rate is usually associated with \_\_\_\_\_.
  - a. expiration
  - b. inspiration
  - c. excessive caffeine intake
  - d. early signs of heart failure

ANS: B

Sinus arrhythmia that is associated with the phases of breathing and changes in intrathoracic pressure is called *respiratory sinus arrhythmia*. The rhythm is irregular; the heart rate increases gradually during inspiration (R-R intervals shorten) and decreases with expiration (R-R intervals lengthen).

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrhythmia.

2. The rate of sinus tachycardia is \_\_\_\_\_ beats/min.
  - a. slower than 60
  - b. 40 to 80
  - c. 60 to 100
  - d. faster than 100

ANS: D

The rate of sinus tachycardia is between 101 and 180 beats/min.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

3. An ECG rhythm strip shows a ventricular rate of 46 bpm, a regular rhythm, a PR interval of 0.14 seconds, a QRS duration of 0.06 seconds, and one upright P wave before each QRS. This rhythm is \_\_\_\_\_.
  - a. sinus rhythm
  - b. sinus bradycardia
  - c. sinus arrest
  - d. sinoatrial block

ANS: B

The rhythm described fits the ECG criteria for a sinus bradycardia.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

4. An ECG rhythm strip shows a ventricular rate of 128 bpm, a regular rhythm, a PR interval of 0.16 seconds, a QRS duration of 0.08 seconds, and one upright P wave before each QRS. This rhythm is sinus \_\_\_\_\_.
  - a. arrhythmia
  - b. bradycardia

- c. rhythm
- d. tachycardia

ANS: D

The rhythm described fits the ECG criteria for a sinus tachycardia.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

5. Which of the following are possible causes of sinus tachycardia?
- a. Hypothermia, hypovolemia
  - b. Hypoxia, calcium channel blocker overdose
  - c. Fever, pain, anxiety
  - d. Vomiting, vagal maneuvers

ANS: C

Causes of sinus tachycardia include: acute myocardial infarction; caffeine-containing beverages; dehydration, hypovolemia; drugs such as cocaine, amphetamines, ecstasy, cannabis; exercise; fear and anxiety; fever; heart failure; hyperthyroidism; hypoxia; infection; medications such as epinephrine, atropine, and dopamine; nicotine; pain; pulmonary embolism; shock; sympathetic stimulation.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

6. Which of the following are possible causes of sinus bradycardia?
- a. Elevated temperature, pain
  - b. Increased intracranial pressure, beta-blocker overdose
  - c. Hypoxia, fright, caffeine-containing beverages
  - d. Hypovolemia, administration of sympathomimetics

ANS: B

Causes of sinus bradycardia include: disease of the SA node; hyperkalemia; hypokalemia; hypothermia; hypothyroidism; hypoxia; increased intracranial pressure; inferior myocardial infarction (MI); medications such as calcium channel blockers, digitalis, beta-blockers, amiodarone, and sotalol; obstructive sleep apnea; post heart transplant; posterior MI; and vagal stimulation.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

7. The rate of a sinus rhythm is \_\_\_\_ beats/min.
- a. slower than 60
  - b. 60 to 100
  - c. 80 to 120
  - d. faster than 100

ANS: B

The rate of a sinus rhythm is between 60 and 100 beats/min.

OBJ: Describe the ECG characteristics of a sinus rhythm.

8. Which of the following may cause a sinus bradycardia?
- Stress or anxiety
  - Increased sympathetic tone
  - Fever
  - Hypothermia

ANS: D

Causes of sinus bradycardia include: disease of the SA node; hyperkalemia; hypokalemia; hypothermia; hypothyroidism; hypoxia; increased intracranial pressure; inferior myocardial infarction (MI); medications such as calcium channel blockers, digitalis, beta-blockers, amiodarone, and sotalol; obstructive sleep apnea; post heart transplant; posterior MI; and vagal stimulation.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

9. Which of the following correctly reflects the ECG criteria for a sinus rhythm?
- More P waves than QRS complexes
  - P waves that look alike and upright in lead II, one before each QRS complex
  - Irregular atrial and ventricular rhythm
  - PR interval exceeding 0.20 seconds

ANS: B

Characteristics of sinus rhythm:

Rhythm	R-R and P-P intervals are regular
Rate	60 to 100 beats/min
P waves	Positive (upright) in lead II; one precedes each QRS complex; P waves look alike
PR interval	0.12 to 0.20 seconds and constant from beat to beat
QRS duration	0.11 seconds or less unless abnormally conducted

OBJ: Describe the ECG characteristics of a sinus rhythm.

10. Management of a patient with a sinus tachycardia might include \_\_\_\_.
- identification and treatment of the underlying cause
  - administration of atropine
  - use of a pacemaker
  - vagal maneuvers, such as carotid sinus pressure

ANS: A

Treatment for sinus tachycardia is directed at correcting the underlying cause (i.e., fluid replacement, relief of pain, removal of offending medications or substances, reducing fever or anxiety). Sinus tachycardia in a patient experiencing an acute myocardial infarction (MI) may be treated with medications to slow the heart rate and decrease myocardial oxygen demand (e.g., beta-blockers), provided there are no signs of heart failure or other contraindications.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

11. The rate of a sinus bradycardia is \_\_\_\_ beats/min.
- slower than 60

- b. 60 to 100
- c. 80 to 120
- d. faster than 100

ANS: B

If the SA node fires at a rate that is slower than normal for the patient's age, the rhythm is called *sinus bradycardia*. The rhythm starts in the SA node and then travels the normal conduction pathway, resulting in atrial and ventricular depolarization. In adults and adolescents, a sinus bradycardia has a heart rate of less than 60 beats/min. The term *severe sinus bradycardia* is sometimes used to describe a sinus bradycardia with a rate of less than 40 beats/min.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

### SHORT ANSWER

1. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 70 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

2. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus bradycardia at 48 beats/min with ST-segment depression

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

3. Identify the following rhythm (lead II): \_\_\_\_\_

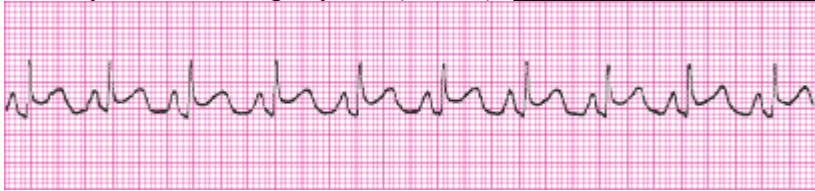


ANS:

Sinus rhythm at 65 beats/min with ST-segment depression

OBJ: Describe the ECG characteristics of a sinus rhythm.

4. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 98 beats/min with ST-segment elevation

OBJ: Describe the ECG characteristics of a sinus rhythm.

5. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at a rate of 36 to 71 beats/min with an episode of SA block

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinoatrial block.

6. Identify the following rhythm: \_\_\_\_\_

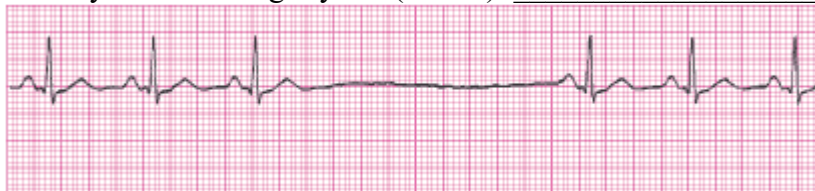


ANS:

Sinus rhythm at 71 beats/min with a wide QRS, ST-segment depression

OBJ: Describe the ECG characteristics of a sinus rhythm.

7. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at a rate of 24 to 81 beats/min with an episode of sinus arrest

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrest.

8. Identify the following rhythm (lead II): \_\_\_\_\_

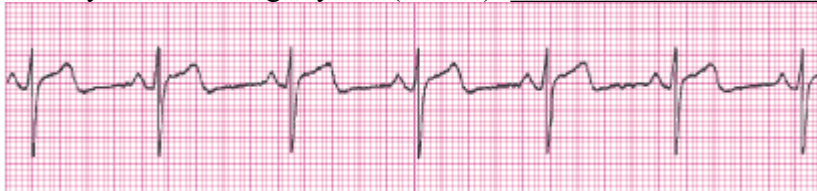


ANS:

Sinus tachycardia at 140 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

9. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 65 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

10. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus tachycardia at 167 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

11. Identify the following rhythm (lead II): \_\_\_\_\_





ANS:

Sinus rhythm with a wide QRS at 100 beats/min; ST-segment depression, inverted T waves

OBJ: Describe the ECG characteristics of a sinus rhythm.

12. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus tachycardia at 111 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

13. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm (borderline sinus bradycardia) at 60 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

14. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus bradycardia at 58 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

15. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 85 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

16. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus arrhythmia at 52 to 94 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrhythmia.

17. Identify the following rhythm (lead I): \_\_\_\_\_



ANS:

Sinus tachycardia at 150 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

18. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus bradycardia at 40 beats/min; ST-segment depression, inverted T waves

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.



19. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 95 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

20. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus arrhythmia at 71 to 100 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrhythmia.

21. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 71 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

22. Identify the following rhythm (lead II): \_\_\_\_\_

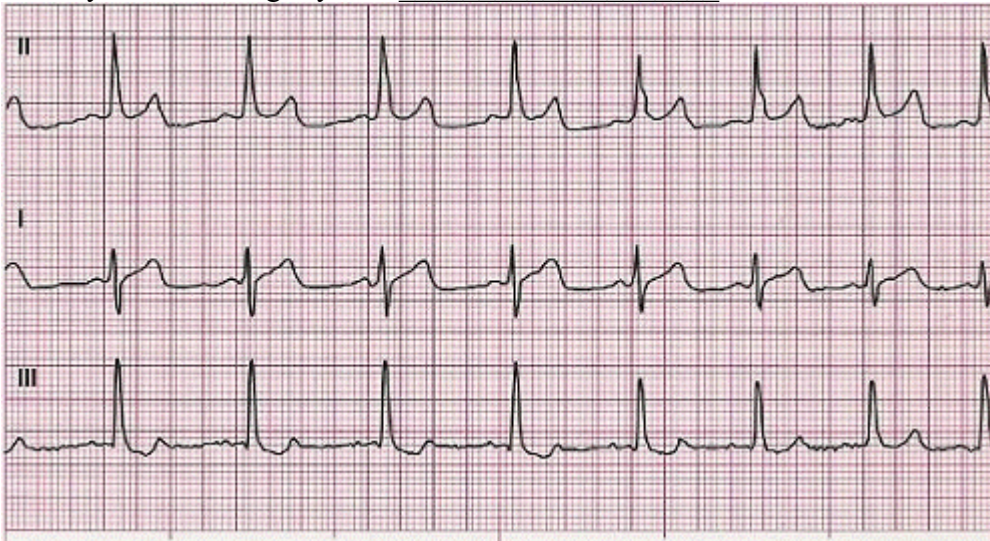


ANS:

Sinus bradycardia at 44 beats/min, ST-segment depression. Note the upright U waves following each T wave.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

23. Identify the following rhythm: \_\_\_\_\_



ANS:  
Sinus rhythm at 75 beats/min, ST-segment depression

OBJ: Describe the ECG characteristics of a sinus rhythm.

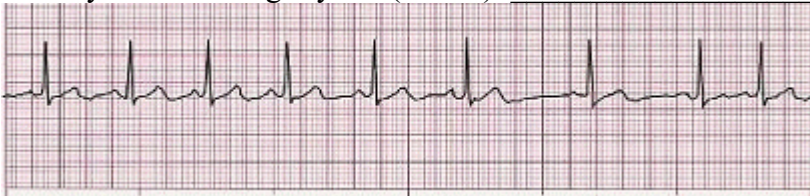
24. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:  
Sinus rhythm with a wide QRS at 83 beats/min

OBJ: Describe the ECG characteristics of a sinus rhythm.

25. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:  
Sinus arrhythmia at 64 to 94 beats/min

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrhythmia.

26. Identify the following rhythm (lead II): \_\_\_\_\_

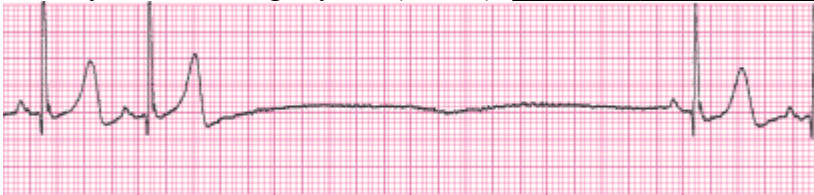


ANS:

Sinus rhythm at 94 beats/min with a wide (and notched) QRS, ST-segment depression

OBJ: Describe the ECG characteristics of a sinus rhythm.

27. Identify the following rhythm (lead II): \_\_\_\_\_



ANS:

Sinus rhythm at 0 to 75 beats/min with an episode of sinus arrest; tall T waves

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrest.

28. List three significant signs and/or symptoms that, if observed with a sinus bradycardia, would require management of this dysrhythmia.

ANS:

Clinical signs and symptoms of hemodynamic compromise can include: acute changes in mental status; chest pain or discomfort; cold, clammy skin; fall in urine output; heart failure; low blood pressure; pulmonary congestion; shock; and shortness of breath.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

29. Complete the following ECG criteria for a sinus rhythm:

Rhythm \_\_\_\_\_  
 Rate \_\_\_\_\_  
 P waves \_\_\_\_\_  
 PR interval \_\_\_\_\_  
 QRS duration \_\_\_\_\_

ANS:

Rhythm	P-P interval regular, R-R interval regular.
Rate	60 to 100 beats/min.
P waves	Positive (upright) in lead II, one precedes each QRS complex, P waves look alike.
PR interval	0.12 to 0.20 seconds and constant from beat to beat.
QRS duration	0.11 seconds or less unless abnormally conducted.

OBJ: Describe the ECG characteristics of a sinus rhythm.

30. Complete the following ECG criteria for a sinus bradycardia:

Rhythm \_\_\_\_\_  
Rate \_\_\_\_\_  
P waves \_\_\_\_\_  
PR interval \_\_\_\_\_  
QRS duration \_\_\_\_\_

ANS:

Rhythm	P-P interval regular, R-R interval regular.
Rate	Less than 60 beats/min.
P waves	Positive (upright) in lead II, one precedes each QRS complex, P waves look alike.
PR interval	0.12 to 0.20 seconds and constant from beat to beat.
QRS duration	0.11 seconds or less unless abnormally conducted.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus bradycardia.

31. Complete the following ECG criteria for a sinus tachycardia:

Rhythm \_\_\_\_\_  
Rate \_\_\_\_\_  
P waves \_\_\_\_\_  
PR interval \_\_\_\_\_  
QRS duration \_\_\_\_\_

ANS:

Rhythm	P-P interval regular, R-R interval regular.
Rate	101 to 180 beats/min.
P waves	Positive (upright) in lead II, one precedes each QRS complex, P waves look alike; at very fast rates, it may be hard to tell the difference between a P wave from a T wave.
PR interval	0.12 to 0.20 seconds (may shorten with faster rates) and constant from beat to beat.
QRS duration	0.11 seconds or less unless abnormally conducted.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus tachycardia.

32. Complete the following ECG criteria for a sinoatrial (SA) block:

Rhythm \_\_\_\_\_  
Rate \_\_\_\_\_  
P waves \_\_\_\_\_  
PR interval \_\_\_\_\_  
QRS duration \_\_\_\_\_

ANS:

Rhythm	Irregular because of the pause caused by the SA block; the pause is the same as (or an exact multiple of) the distance between two other P-P intervals.
Rate	Usually normal, but varies because of the pause.
P waves	Positive (upright) in lead II, P waves look alike; when present, one precedes each QRS complex.
PR interval	0.12 to 0.20 seconds and constant from beat to beat.
QRS duration	0.11 seconds or less unless abnormally conducted.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinoatrial block.

33. Complete the following ECG criteria for a sinus arrest:

Rhythm \_\_\_\_\_  
 Rate \_\_\_\_\_  
 P waves \_\_\_\_\_  
 PR interval \_\_\_\_\_  
 QRS duration \_\_\_\_\_

ANS:

Rhythm	Irregular—the pause is of undetermined length (more than one PQRST complex is missing) and is not the same distance as other P-P intervals.
Rate	Usually normal, but varies because of the pause.
P waves	Positive (upright) in lead II, P waves look alike; when present, one precedes each QRS complex.
PR interval	0.12 to 0.20 seconds and constant from beat to beat.
QRS duration	0.11 seconds or less unless abnormally conducted.

OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrest.

34. Complete the following ECG criteria for a sinus arrhythmia:

Rhythm \_\_\_\_\_  
 Rate \_\_\_\_\_  
 P waves \_\_\_\_\_  
 PR interval \_\_\_\_\_  
 QRS duration \_\_\_\_\_

ANS:

Rhythm	Irregular, phasic with breathing; heart rate increases gradually during inspiration (R-R intervals shorten) and decreases with expiration (R-R intervals lengthen).
Rate	Usually 60-100 beats/min, but may be slower or faster.
P waves	Positive (upright) in lead II, one precedes each QRS complex, P waves look alike.
PR interval	0.12 to 0.20 seconds and constant from beat to beat.
QRS duration	0.11 seconds or less unless abnormally conducted.



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OBJ: Describe the ECG characteristics, possible causes, signs and symptoms, and emergency management of sinus arrhythmia.