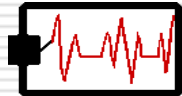


HTEC 91

Medical Office Diagnostic Tests

Week 3



Topic for Today: Sinus Rhythms

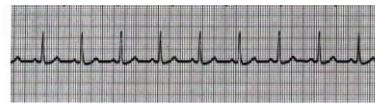
- NSR: Normal Sinus Rhythm
 - SB: Sinus Bradycardia
 - ST: Sinus Tachycardia
 - SA: Sinus Arrhythmia
-

Normal Sinus Rhythm (NSR)

- Electrical impulse is initiated by the SA node
 - Impulse transmitted down the normal conduction pathways
 - SA→AV→Bundle of His→BB→Purkinje
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Characteristics of NSR

- Rhythm: regular
- Rate: 60 to 100 beats per minute



NSR: 8 Steps...

1. P wave: upright, rounded
 - All p waves similar in size and shape
 - A p wave exists for every QRS complex
 2. Atrial rhythm: regular
 3. Atrial rate: 60 to 100 beats per minute
 4. PR interval: within normal limits (0.12 to 0.20 sec)
 5. Ventricular rhythm: regular
 6. Ventricular rate: 60 to 100 beats per minute
 7. QRS complex: within normal limits (0.06 to 0.10 sec)
 8. QT interval: within normal limits (0.36 to 0.44 sec)
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NSR: Significance

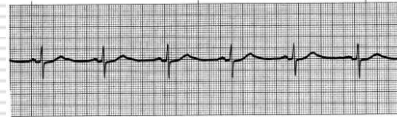
- NSR indicates normal myocardial cell depolarization and repolarization.
 - Normal conduction of the action potential impulse from the SA node.
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NSR: Interventions

- None indicated

Sinus Bradycardia (SB)

- Sinus bradycardia is a sinus rhythm of less than 60 beats per minute.



Characteristics of SB: 8 Steps

1. P wave: normal in size and configuration
 - A p wave precedes every QRS complex
2. Atrial rhythm: regular
3. Atrial rate: less than 60 beats per minute
4. PR interval: within normal limits and constant
5. Ventricular rhythm: regular
6. Ventricular rate: less than 60 beats per minute
7. QRS complex: within normal limits; normal configuration
8. QT interval: usually within normal limits, but may be slightly prolonged

SB: Significance

- In athletes: may be fine
 - The well-conditioned heart can maintain stroke volume with less effort.
- Marked bradycardia can severely decrease cardiac output.
 - Decreased cardiac output is the only cause for concern or reason for intervention

Causes of Sinus Bradycardia

- Medications:
 - Heart and Blood Pressure medications (digitalis, beta blockers)
 - Morphine
 - Others
- Hyperkalemia
- Vagal stimulation (vomiting, straining)
- Myocardial infarction (inferior wall)
- Sleep
- Increased intracranial pressure

SB: Interventions

- If asymptomatic: no treatment needed
- If symptomatic:
 - Treat underlying cause
 - Maintain HR with drugs
 - Pacemaker (temporary or permanent) if severe / not responding to medications

Sinus Tachycardia (ST)

- Sinus tachycardia is a sinus rhythm of more than 100 beats per minute.



Characteristics of ST: 8 Steps

1. P wave: normal in size and configuration
 - A p wave precedes every QRS complex
2. Atrial rhythm: regular
3. Atrial rate: over 100 beats per minute (usually between 100 and 160 beats per minute)
4. PR interval: within normal limits and constant
5. Ventricular rhythm: regular
6. Ventricular rate: over 100 beats per minute (usually between 100 and 160 beats per minute)
7. QRS complex: within normal limits; normal configuration
8. QT interval: usually within normal limits, but may be slightly shorter than normal

ST: Significance

- Sinus tachycardia commonly occurs in normal, healthy people.
- Usually no serious adverse effects occur.

Causes of Sinus Tachycardia

- Normal response to increased oxygen demand:
 - Dehydration
 - Hypoxia
 - Hyperthyroidism
 - Anemia
 - Pain
 - Exercise
 - Stress
 - Fever
- Drugs / Medications
 - Caffeine, Nicotine, Alcohol
 - Atropine, epinephrine
 - Digoxin toxicity

ST: Interventions

- If asymptomatic / short duration: no treatment may be needed.
- If symptomatic:
 - Treat underlying cause
 - Slow HR with drugs (beta blockers)

Sinus Arrhythmia (SA)

- Sinus arrhythmia is a sinus dysrhythmia with an irregular rhythm.



Characteristics of SA: 8 Steps

1. P wave: normal in size and configuration
 - A p wave precedes every QRS complex
2. Atrial rhythm: irregular; corresponds to the respiratory cycle
3. Atrial rate: within normal limits (60 to 100 beats per minute)
4. PR interval: may vary slightly, but within normal limits
5. Ventricular rhythm: irregular; corresponds to the respiratory cycle
6. Ventricular rate: within normal limits (60 to 100 beats per minute)
7. QRS complex: within normal limits; normal configuration
8. QT interval: usually within normal limits, may vary slightly

SA: Significance

- Usually not significant
- Occurs in healthy people, usually
 - Children
 - Older adults
 - Athletes

Causes of Sinus Arrhythmia

- Reflex vagal tone inhibition
- It is the normal response of the heart to respiration
 - HR increases with inspiration
 - HR decreases with exhalation
- Can also occur with conditions that increase vagal tone: digitalis toxicity, increased ICP, inferior MI

SA: Interventions

- If asymptomatic: no treatment needed
- If symptomatic:
 - Treat underlying cause
 - Maintain HR with drugs (atropine if HR less than 40 beats per minute)