Sinus Dysrhythmias

Fast & Easy ECGs – A Self-Paced Learning Program
Identifying Dysrhythmias

• Examination of the ECG rhythm must be done in a systematic, organized way
Sinus Rhythms

- Rhythms originating from the SA node are called *sinus rhythms*.

- Sinus rhythm continues at 60 to 100 beats per minute.

- Sinus bradycardia continues at less than 60 beats per minute.

- Sinus tachycardia continues faster than 100 beats per minute.

- Sinus dysrhythmia speeds up and slows down in a cyclical manner.

- Sinus arrest is a pause in the heartbeat.
Normal Sinus Rhythm (NSR)

- During normal heart activity, the SA (sinoatrial) node acts as the primary pacemaker.
- NSR has a heart rate of 60 to 100 BPM (in the average adult).
Sinus Bradycardia

• Has all the characteristics of NSR but the heart rate is < 60 BPM
### Sinus Bradycardia

#### Table 8.1 Causes of Sinus Bradycardia

<table>
<thead>
<tr>
<th>Cause</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac diseases</td>
<td>Intrinsic sinoatrial node disease, cardiomyopathy, myocarditis, myocardial ischemia and/or infarction, and heart block</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Digoxin, beta-adrenergic blockers, calcium channel blockers, lithium, amiodarone, propafenone, and quinidine</td>
</tr>
<tr>
<td>Excessive vagal tone or decreased sympathetic stimulation</td>
<td>Carotid sinus massage, vomiting, Valsalva’s maneuver, deep relaxation, sleep</td>
</tr>
<tr>
<td>Noncardiac disorders</td>
<td>Hypothermia, hypoxia, hyperkalemia, increased intracranial pressure, hypothyroidism, sleep, and glaucoma</td>
</tr>
</tbody>
</table>
Sinus Bradycardia

• Often insignificant and the patient is asymptomatic.
• Hypotension can result if the heart rate slows to the point where cardiac output drops sufficiently.
  – Patients are less tolerant of rates < 45 BPM.
Sinus Tachycardia

• Same characteristics as NSR but has a rate >100 BPM

Sinus tachycardia arises from the SA node. Each impulse travels down through the conduction system in a normal manner.
# Sinus Tachycardia

## Table 8.2 Causes of Sinus Tachycardia

<table>
<thead>
<tr>
<th>Cause</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac diseases</td>
<td>Congestive heart failure, cardiogenic shock, and pericarditis</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Sympathomimetic drugs such as epinephrine; isoproterenol; dopamine; dobutamine; vagolytic drugs such as atropine; or other drugs such as alcohol, caffeine, nicotine, and amphetamines</td>
</tr>
<tr>
<td>Increased sympathetic stimulation</td>
<td>Exercise; pain; stress; fever; fear; anxiety; or as a compensatory mechanism in shock, respiratory distress, hypoxia, pulmonary embolism, anemia, sepsis, and hyperthyroidism</td>
</tr>
</tbody>
</table>
Sinus Tachycardia

- Often of no clinical significance
- Can increase myocardial oxygen consumption
  - which can aggravate ischemia (bringing on chest pain), and infarction, particularly in those with cardiovascular disease
Sinus Dysrhythmia

- Same as NSR except there is a patterned irregularity
- Described as a cycle of “slowing, then speeding up, then slowing again”
Sinus Dysrhythmia

• The beat-to-beat variation produced by irregular firing of the SA node usually corresponds with the respiratory cycle and changes in intrathoracic pressure

• Heart rate increases during inspiration and decreases during expiration
Sinus Dysrhythmia

- Can occur naturally in athletes, children, and older adults
- Can also occur in:
  - Patients with heart disease or inferior wall myocardial infarction
  - Individuals receiving certain drugs such as digitalis and morphine
  - Conditions where there is increased intracranial pressure
Sinus Dysrhythmia

• Usually of no clinical significance and produces no symptoms
• In some patients and conditions it may be associated with palpitations, dizziness, and syncope
Sinus Arrest

• Occurs when the SA node transiently stops firing
• Causes short periods of cardiac standstill until a lower-level pacemaker discharges or the SA node resumes its normal function
Sinus Arrest

- Most prominent characteristic is a pause in ECG rhythm
- Produces an irregularity
- Rhythm typically resumes its normal appearance after pause unless an escape pacemaker resumes the rhythm
Sinus Arrest

Sinus arrest occurs when the SA node fails to initiate an impulse.

- Rate is typically between 60 and 100 beats per minute.
- Rhythm is irregular where there is a pause.
- P waves are normal and all look alike; one precedes each QRS complex (but absent where there is a pause in rhythm).
- QRS complexes are normal and all look alike (but absent where there is a pause in rhythm).
- PR intervals are normal (but absent where there is a pause in the rhythm).
## Sinus Arrest

<table>
<thead>
<tr>
<th>Cause</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinus node disease</td>
<td>Fibrosis, idiopathic degeneration</td>
</tr>
<tr>
<td>Cardiac disorders</td>
<td>Chronic coronary artery disease, myocardial ischemia or infarction, acute myocarditis, cardiomyopathy, hypertensive heart disease</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Digoxin, procainamide, quinidine, salicylates (particularly in toxic doses), excessive doses of beta-adrenergic blockers such as propranolol and metapronol, or calcium channel blockers</td>
</tr>
<tr>
<td>Increased vagal tone</td>
<td>Valsalva’s maneuver, carotid sinus massage, vomiting</td>
</tr>
<tr>
<td>Others</td>
<td>Hyperkalemia, hypoxia</td>
</tr>
</tbody>
</table>
Practice Makes Perfect

- Determine the type of dysrhythmia

Rate: ____________ (atrial) ____________ (ventricular)

P waves: ____________

QRS complexes: ____________

QT intervals: ____________

Regularity: ____________

PR intervals: ____________

Dysrhythmia: ____________
Practice Makes Perfect

- Determine the type of dysrhythmia

Rate: ____________ (atrial) ____________ (ventricular)
P waves: ____________ QRS complexes: ____________
QT intervals: ____________ Dysrhythmia: ____________
Regularity: ____________
PR intervals: ____________
Practice Makes Perfect

- Determine the type of dysrhythmia

Rate: ____________ (atrial) ____________ (ventricular)
P waves: ____________ QRS complexes: ____________
QT intervals: ____________ Dysrhythmia: ____________

Regularity: ____________
PR intervals: ____________
Practice Makes Perfect

• Determine the type of dysrhythmia

Rate: ___________ (atrial) ___________ (ventricular)
P waves: ___________ QRS complexes: ___________
QT intervals: ___________ Dysrhythmia: ___________
Regularity: ___________
PR intervals: ___________
Practice Makes Perfect

- Determine the type of dysrhythmia

Rate: __________ (atrial) __________ (ventricular)
P waves: __________
QRS complexes: __________
QT intervals: __________
Dysrhythmia: __________

Regularity: __________
PR intervals: __________
Practice Makes Perfect

- Determine the type of dysrhythmia

![ECG Image]

Rate: ___________ (atrial) ___________ (ventricular)
P waves: ___________ QRS complexes: ___________
QT intervals: ___________ Dysrhythmia: ___________

Regularity: ___________
PR intervals: ___________
Practice Makes Perfect

- Determine the type of dysrhythmia

Rate: ____________ (atrial) ____________ (ventricular)
P waves: ____________ QRS complexes: ____________
QT intervals: ____________ Dysrhythmia: ____________

Regularity: ____________
PR intervals: ____________
Practice Makes Perfect

• Determine the type of dysrhythmia

Rate: ___________ (atrial) ___________ (ventricular)  

P waves: ___________  QRS complexes: ___________  

QT intervals: ___________  Dysrhythmia: ___________  

Regularity: ___________  PR intervals: ___________
Practice Makes Perfect

- Determine the type of dysrhythmia

Rate: __________ (atrial) __________ (ventricular)
P waves: __________
QRS complexes: __________
QT intervals: __________
Dysrhythmia: __________

Regularity: __________
PR intervals: __________
A dysrhythmia is an ECG rhythm that differs from normal sinus rhythm (NSR).

Examination of the ECG rhythm must be done in a systematic, organized way.

Rhythms originating from the SA node are called sinus rhythms.
Summary

- Normal sinus rhythm has a heart rate of 60 to 100 BPM (in the average adult).

- Sinus bradycardia has all the characteristics of normal sinus rhythm but the heart rate is less than 60 BPM.

- Sinus tachycardia has the same characteristics as normal sinus rhythm but has a rate of greater than 100 BPM.
Summary

• Sinus dysrhythmia is the same as sinus rhythm except there is the presence of a patterned irregularity. It can be described as a cycle of “slowing, then speeding up, then slowing again.”

• With sinus arrest the ECG rhythm looks like normal sinus rhythm except there is a pause in the rhythm or an absence of the P, QRS, and T waveforms until a pacemaker site reinitiates the rhythm.