Junctional Dysrhythmias

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

- Originate in AV junction (area around AV node and bundle of His)
Junctional Dysrhythmias

- Key characteristics
  - P’ waves may be inverted with a short P’R interval, absent (as they are buried by the QRS complex), or follow QRS complexes
  - QRS complexes usually normal unless there is an intraventricular conduction defect, aberrancy or preexcitation
Premature Junctional Complex (PJC)

- Single early electrical impulse that arises from the AV junction
Premature Junctional Complex

Premature Junctional Complexes

- Characteristics
  - Rate: Depends on underlying rhythm
  - Regularity: Irregular due to early beat
  - P waves: Will be inverted — may precede, be buried in, or follow the QRS complex
  - QRS complexes: Normal
  - PR intervals: Will be shorter than 0.12 seconds in duration
  - QT intervals: Usually within normal limits
# Premature Junctional Complex

## Table 10-1  Premature Junctional Complexes

<table>
<thead>
<tr>
<th>Causes of PJC</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac disorders</td>
<td>Ischemia, acute myocardial infarction, damage to the AV junction, congestive heart failure, valvular disease, rheumatic heart disease, swelling of the AV junction after heart surgery</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Digitalis toxicity, other cardiac medications (quindine, procainamide), sympathomimetic drugs (cocaine, methamphetamine)</td>
</tr>
<tr>
<td>Other</td>
<td>Excessive caffeine, tobacco, or alcohol intake; increased vagal tone on the SA node; hypoxia; electrolyte imbalance (particularly magnesium and potassium); exercise</td>
</tr>
</tbody>
</table>
Junctional Escape Rhythm

- Arises from AV junction at rate of 40 to 60 BPM

Junctional escape rhythm arises from a single site in the AV junction.

- Rate is 40 to 60 beats per minute
- Rhythm is regular
- P' waves are inverted; may appear before, during, or after the QRS complex
- QRS complexes are normal and all look alike
- If present, the P'R intervals will be shorter than normal
Junctional Escape Rhythm

Characteristics

- **Rate**: 40 to 60 beats per minute
- **Regularity**: Regular
- **P waves**: 
P’ waves are inverted; may appear before, during, or after the QRS complex
- **QRS complexes**: Normal, all appear the same
- **PR intervals**: If present, the P’R intervals will be shorter than normal
- **QT intervals**: Within normal range
### Table 10-2  Junctional Escape Rhythm

<table>
<thead>
<tr>
<th>Causes of junctional escape rhythm</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac disorders</td>
<td>Increased vagal tone on the SA node, disease of the SA node (sick sinus syndrome), inferior wall myocardial infarction, rheumatic heart disease, valvular disease</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Digitalis, quinidine, beta-blockers, calcium channel blockers</td>
</tr>
<tr>
<td>Other</td>
<td>Postcardiac surgery, hypoxia</td>
</tr>
</tbody>
</table>
Accelerated Junctional Rhythm

- Arises from AV junction at rate of 60 to 100 BPM
Accelerated Junctional Rhythm

**Characteristics**

- **Rate**: 60 to 100 beats per minute
- **Regularity**: Regular
- **P waves**: P' waves are inverted; may appear before, during, or after the QRS complex
- **QRS complexes**: Normal, all appear the same
- **PR intervals**: If present, the P'R intervals will be shorter than normal
- **QT intervals**: Within normal range
# Accelerated Junctional Rhythm

## Table 10-3  Accelerated Junctional Rhythm

<table>
<thead>
<tr>
<th>Causes of Accelerated Junctional Rhythm</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac disorders</td>
<td>Inferior or posterior wall myocardial infarction, rheumatic fever, post open-heart surgery</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Digoxin toxicity</td>
</tr>
<tr>
<td>Other</td>
<td>Hypokalemia, COPD</td>
</tr>
</tbody>
</table>
Junctional Tachycardia

- Fast ectopic rhythm that arises from bundle of His at rate of 100 to 180 BPM
Junctional Tachycardia

**Characteristics**

- **Rate**: 100 to 180 beats per minute
- **Regularity**: Regular
- **P waves**: P’ waves are inverted; may appear before, during, or after the QRS complex
- **QRS complexes**: Normal, all appear the same
- **PR intervals**: If present, the P’R intervals will be shorter than normal
- **QT intervals**: Within normal range
## Junctional Tachycardia

### Table 10-4  Junctional Tachycardia

<table>
<thead>
<tr>
<th>Causes of junctional tachycardia</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac disorders</td>
<td>Inferior or posterior wall myocardial infarction, swelling of the AV junction after heart surgery, damage to AV junction from inferior wall MI or rheumatic fever, post open-heart surgery</td>
</tr>
<tr>
<td>Use of certain drugs</td>
<td>Digoxin toxicity, particularly in the presence of hypokalemia</td>
</tr>
<tr>
<td>Other</td>
<td>Excessive catecholamine administration, anxiety, hypoxia, electrolyte imbalance (particularly hypokalemia)</td>
</tr>
</tbody>
</table>
Practice Makes Perfect

• Determine the type of dysrhythmia
Practice Makes Perfect

- Determine the type of dysrhythmia
Practice Makes Perfect

• Determine the type of 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

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: ____________
Summary

• Junctional rhythms originate in the AV junction.

• Impulses originating in the AV junction travel upward and cause backward or retrograde depolarization of the atria resulting in inverted P’ waves in lead II with a short P’R interval, absent P waves or P waves that follow the QRS complexes.

• With junctional dysrhythmias the QRS complexes are usually normal unless there is an intraventricular conduction defect, aberrancy or preexcitation.
Summary

• A premature junctional complex (PJC) is a single early electrical impulse that arises from the AV junction.

• Junctional escape rhythm arises from the AV junction at a rate of 40 to 60 beats per minute.

• Accelerated junctional rhythm arises from the AV junction at a rate of 60 to 100 beats per minute.

• Junctional tachycardia is a fast ectopic rhythm that arises from the bundle of His at a rate of between 100 and 180 beats per minute.