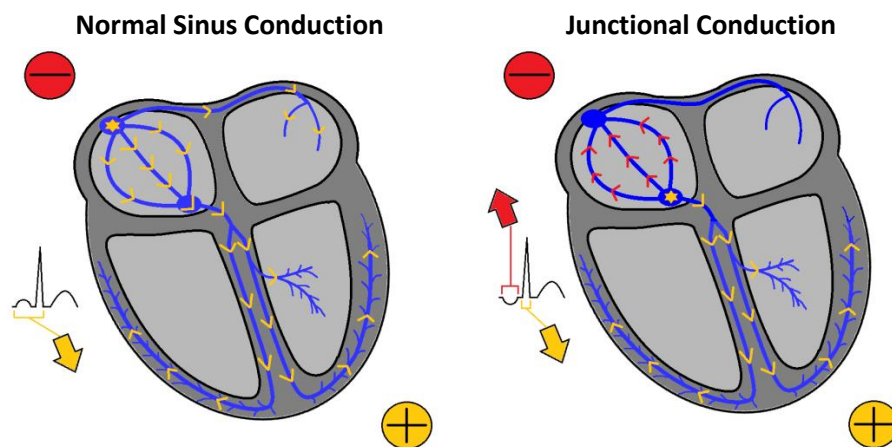


Junctional Rhythm

In a normal heart the SA node is the dominant pacemaker producing Sinus Rhythm. If the SA node paces too slowly, or not at all, the AV node may be able to pace the heart. The AV node is a secondary pacemaker and it produces Junctional Rhythm.

Junctional rhythm can be identified based on its rate, QRS width, and morphology of P waves. The rate at which the AV node paces is usually between 40-60 bpm. When the AV node initiates depolarization the electrical impulses depolarize the ventricles in the same way as Sinus Rhythm. This means the QRS for Sinus Rhythm will usually look identical to that of Junctional Rhythm. The QRS for Junctional Rhythm should be narrow unless a bundle branch block is present.



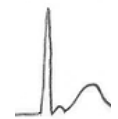
The P wave morphologies for Junctional rhythm can be confusing. Depending on the sequence of depolarization there are several possible outcomes.



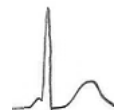
Inverted P wave indicating the AV node depolarized the atria from the bottom up.



Hidden P wave indicating that atrial depolarization and ventricular depolarization occurred simultaneously.



Retrograde P waves indicate the AV node initiated depolarization but the ventricles were depolarized just before the atria.



Short upright P wave merging into the QRS indicates the SA node initiated atrial depolarization but the AV node depolarized before atrial depolarization was complete.

Junctional Escape Rhythm

Junctional Escape Rhythm produces a heart rate between 40-60 beats per minute and has a relatively narrow QRS. The P waves may be hidden (Example Strip 1), inverted, retrograde, or short/upright. If there is only one late Junctional beat (Example Strip 2) this is referred to as a Junctional Escape Beat.

Rhythm Characteristics:

- Regularity: Regular
- Rate: 40-60 bpm
- P wave: May be inverted, hidden, retrograde, or upright/short.
- PR interval: <.12 seconds if present.
- QRS: Relatively narrow

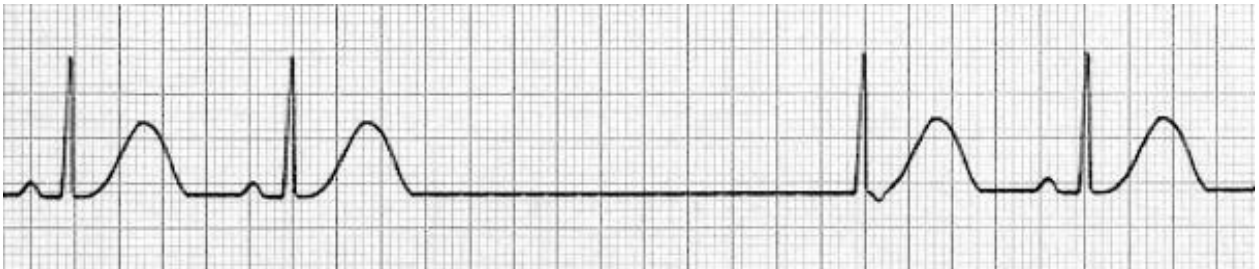
Example Strip 1: Junctional Escape Rhythm



Regularity: Regular Rate: 42 bpm P wave: Hidden PR: N/A QRS: .08 QT: .46

Rhythm interpretation: Junctional Escape Rhythm

Example Strip 2: Sinus Rhythm with Junctional Escape Beat



Accelerated Junctional Rhythm

Accelerated Junctional Rhythm produces a heart rate between 60-100 beats per minute and has a relatively narrow QRS. The P waves may be hidden, inverted (Example Strip 3), retrograde, or short/upright. When one early Junctional beat occurs it is referred to as a Premature Junctional Contraction or PJC (Example Strip 4).

Rhythm Characteristics:

- Regularity: Regular
- Rate: 60-100 bpm
- P wave: May be inverted, hidden, retrograde, or upright/short.
- PR interval: <.12 seconds if present.
- QRS: Relatively narrow

Example Strip 3: Accelerated Junctional Rhythm



Regularity: Regular Rate: 70 bpm P wave: Inverted PR: .10 QRS: .08 QT: .49

Rhythm Interpretation: Accelerated Junctional Rhythm

Example Strip 4: Sinus Rhythm with PJC



Junctional Tachycardia

Junctional Tachycardia produces a heart rate > 100 beats per minute and has a relatively narrow QRS. The P waves may be hidden, inverted, retrograde (Example Strip 5), or short/upright. Junctional Tachycardia may be difficult to identify as the heart rate increases and is rarely seen in adult patients.

Rhythm Characteristics:

- Regularity: Regular
- Rate: > 100 bpm
- P wave: May be inverted, hidden, retrograde, or upright/short.
- PR interval: <.12 seconds if present.
- QRS: Relatively narrow

Example Strip 5: Junctional Tachycardia



Regularity: Regular Rate: 120 bpm P wave: Retrograde (1:1) PR: N/A QRS: .08 QT: .44 Rhythm

Interpretation: Junctional Tachycardia

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