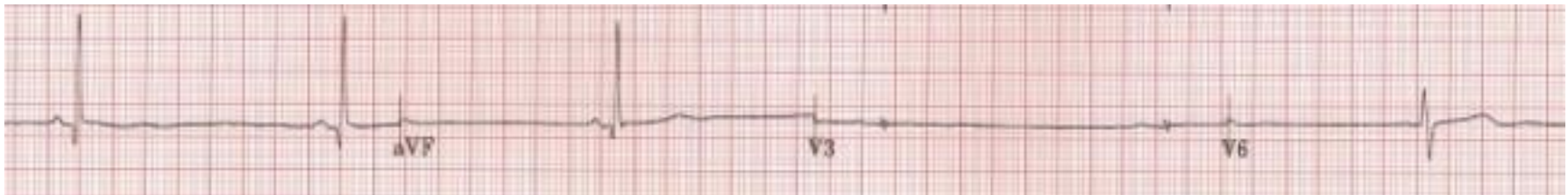


Foundations EKG I - Unit 4 Summary

Approach to Bradyarrhythmias

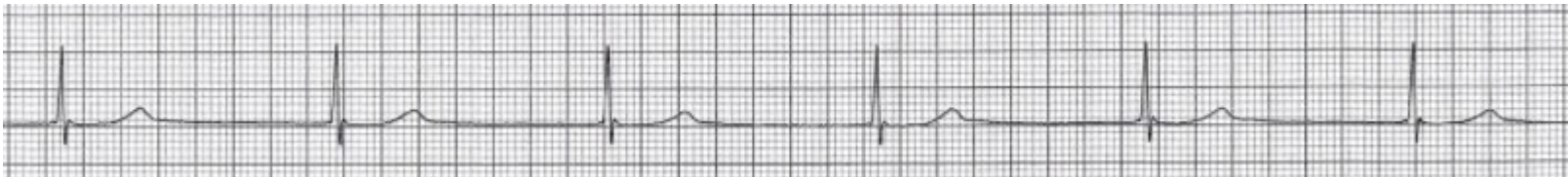
Bradyarrhythmias can be secondary to a variety of causes. Determining the specific type of bradyarrhythmia helps pinpoint where in the heart trouble might lie. Often evaluation requires careful inspection of the rhythm strip and sometimes of a prolonged 12 lead EKG.



Sinus bradycardia may be due to normal functioning of the heart, or can be caused by electrolyte abnormalities or pharmacological influences. A rate under 60 bpm in normal adults is considered bradycardic. Note in sinus bradycardia the rhythm has normal conducting p waves followed by a QRS with normal intervals. In symptomatic patients atropine is an appropriate first treatment while trying to identify other reversible causes.

Understanding the intrinsic rates of various pacemaker foci within the heart will help you distinguish the main driver of an impulse. In a normal, healthy heart the SA node is the only pacemaker you will see on the EKG.

- SA node: 60-100 bpm
- Atria: 60-80 bpm
- Junctional: 40-60 bpm
- Ventricular: 20-40 bpm



In the above example we see a rate of approximately 40 bpm. There are no p waves. The QRS is narrow (distinguishing it from ventricular conduction in many cases.) It is an example of a **junctional rhythm** causing bradycardia.



A rhythm with a progressively prolonging PR interval that eventually leads to a dropped beat, followed by a short PR interval that again progressively prolongs is consistent with a **2nd Degree AV block, Mobitz I** (also known as **Wenckebach Phenomenon**).

In an asymptomatic patient, this rhythm is benign with low risk of hemodynamic instability and relatively rare progression to third degree heart block. Atropine usually works for symptomatic patients.

Possible causes include:

- Beta-blocking and calcium channel blocking drugs
- Myocarditis
- Inferior MI
- Increased vagal tone

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Intermittently dropped beats with normal PR intervals are consistent with **2nd degree AV block, Mobitz II**. In this pattern the beat is dropped without any predictable pattern. This rhythm is much more likely to cause hemodynamic instability than Mobitz I and may develop into third degree heart block. In addition to investigating possible causes these patients should be immediately admitted for permanent pacemaker placement.



In **third degree heart block** (also known as complete heart block), the supraventricular impulses are not conducted to the ventricles. QRS complexes march through the rhythm strip completely independently of the p waves. The perfusing rhythm is the ventricular rhythm causing severe bradycardia. Even in patients with a normal blood pressure who are asymptomatic this is a serious emergency—these patients are at risk for ventricular standstill. In symptomatic or hypotensive patients pacing (external or internal) is indicated. Immediate permanent pacemaker placement is imperative.



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When there is no conduction from supraventricular impulses the rhythm seen is a **ventricular escape rhythm**. In this case the only impulses seen on an EKG are the ventricular QRS complexes at a rate of 20-40 bpm. The QRS is widened in this case because the impulse is from an ectopic focus lying outside of the His-Purkinje system.

Definitive management requires immediate permanent pacemaker placement.

