• Atrial Arrhythmias

By

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Learning Objectives

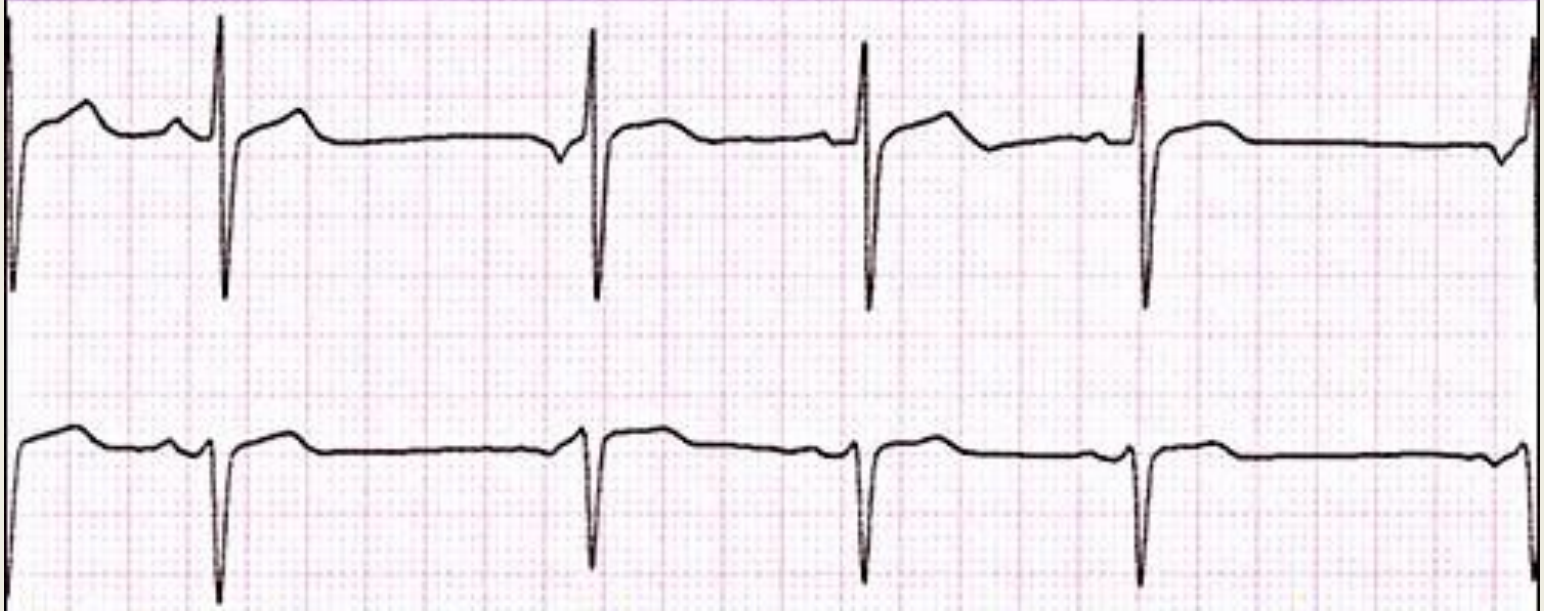
- What is Arrhythmia?
- How to calculate heart rate on ECG?
- What is sinus rhythm?
- What is sinus arrhythmia?
- What are the types of arrhythmia?
- What is the pre-excitation of ventricles by abnormal accessory pathways?
- What is WPW syndrome?
- What is heart block?
- What are the types of heart block?

Atrial Arrhythmia

- Atrial tachycardia
- Atrial flutter
- Atrial fibrillation

Atrial Rhythms

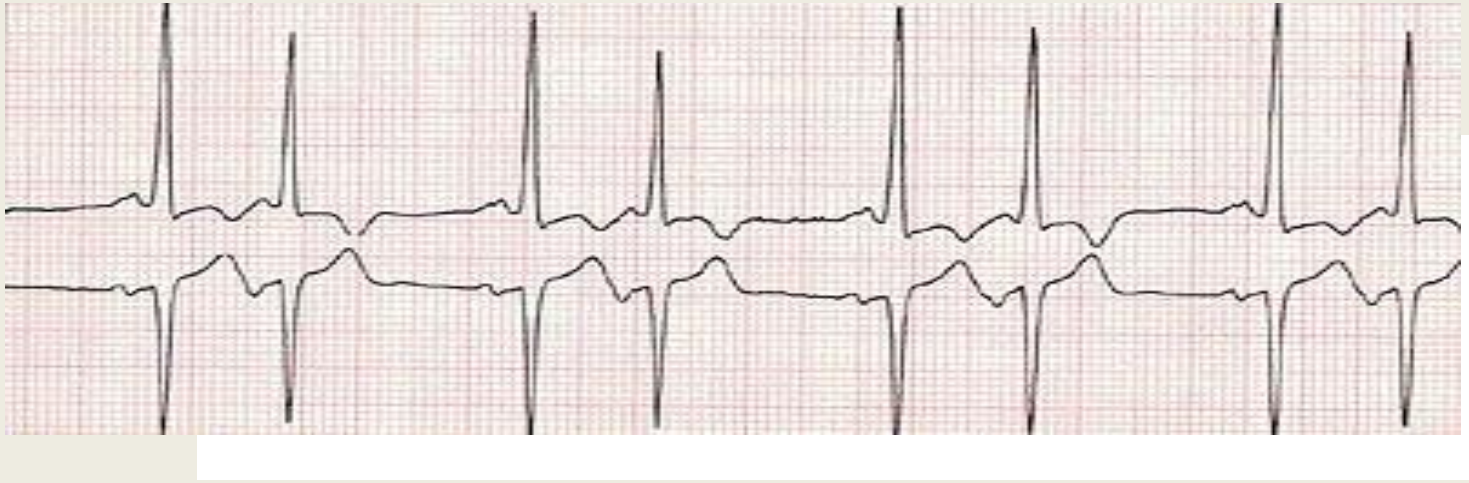
Wandering Pacemaker



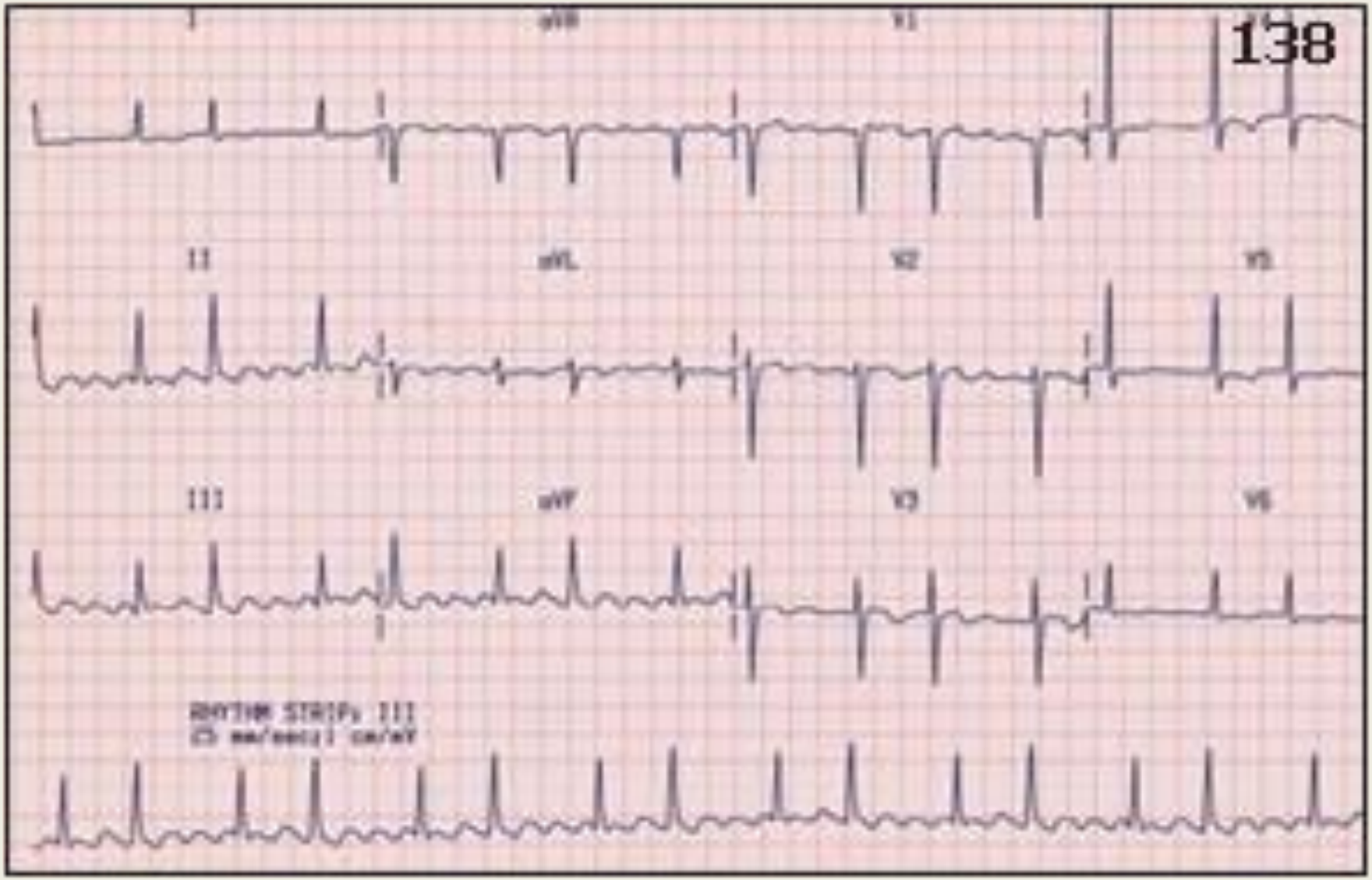
Heart Rate	Rhythm	P Wave	PR interval (in seconds)	QRS (in seconds)
Usually <60 bpm	Irregular	Multiple forms	Variable	<.12

Atrial Rhythms

Premature Atrial Contraction (PAC)



Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
NA	Irregular	Premature & abnormal or hidden	.12 - .20	<.12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Atrial Rhythms

– Premature Atrial Contraction (PAC)

- One P-wave for every QRS
  - P-wave may have different morphology on ectopic beat, but it *will* be present
- Single ectopic beat will disrupt regularity of underlying rhythm
- Rate will depend on underlying rhythm
- Underlying rhythm must be identified
- Classified as rare, occasional, or frequent PAC's based on frequency

Atrial Rhythms

Atrial Fibrillation

Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
Var.	Irregular	Wavy irregular	NA	<.12

Atrial Rhythms

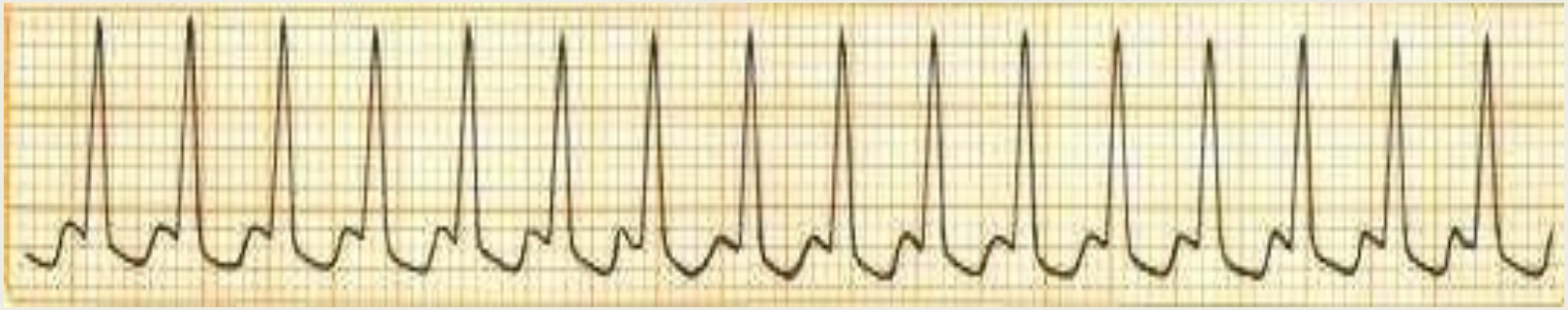
- **Atrial Fibrillation**
  - *No discernable p-waves preceding the QRS complex*
    - The atria are not depolarizing effectively, but fibrillating
  - *Rhythm is grossly irregular*
  - If the heart rate is <100 it is considered controlled a-fib, if >100 it is considered to have a “rapid ventricular response”
  - AV node acts as a “filter”, blocking out most of the impulses sent by the atria in an attempt to control the heart rate

Atrial Rhythms

- Atrial Fibrillation (con't)
  - **Often a chronic condition**, medical attention only necessary if patient becomes symptomatic
  - Patient will report history of atrial fibrillation.

Atrial Rhythms

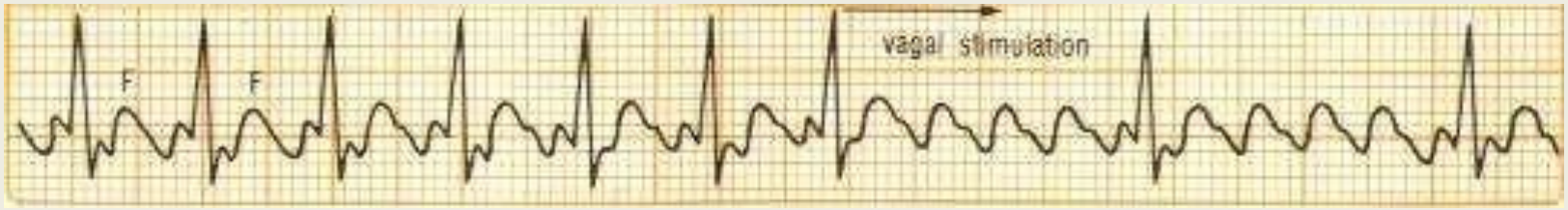
Atrial Tachycardia



Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
140 – 250	Irregular	Abnormal and present but may be hidden on ST segment or T wave	Not measure-able	<.12 but may be wide

Atrial Rhythms

Atrial Flutter



Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
Atrial=250 – 400 Ventricular Var.	Irregular	Sawtooth	Not Measur-able	<.12

Atrial Rhythms

- **Atrial Flutter**
  - *More than one p-wave for every QRS complex*
    - Demonstrate a “sawtooth” appearance
  - Atrial rhythm is regular. Ventricular rhythm will be regular if the AV node conducts consistently. If the pattern varies, the ventricular rate will be irregular
  - Rate will depend on the ratio of impulses conducted through the ventricles

Atrial Rhythms

- **Atrial Flutter**
  - Atrial flutter is classified as a ratio of p-waves per QRS complexes (ex: 3:1 flutter 3 p-waves for each QRS)
  - Not considered as life threatening, consult physician if patient symptomatic

Junctional Rhythms

- Rhythms that originate at the AV junction
- Junctional rhythms do not have characteristic p-waves.

Junctional Rhythms

Premature Junctional Contraction PJC

Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
Usually normal	Irregular	Premature, abnormal, may be inverted or hidden	Short <.12	Normal <.12

Junctional Rhythms

- Premature Junctional Contraction (PJC)
  - *P-wave can come before or after the QRS complex, or it may lost in the QRS complex*
    - *If visible, the p-wave will be inverted*
  - Rhythm will be irregular due to single ectopic beat
  - Heart rate will depend on underlying rhythm
  - Underlying rhythm must be identified
  - Classify as rare, occasional, or frequent PJC based on frequency
  - Atria are depolarized via retrograde conduction

Junctional Rhythms

Accelerated Junctional

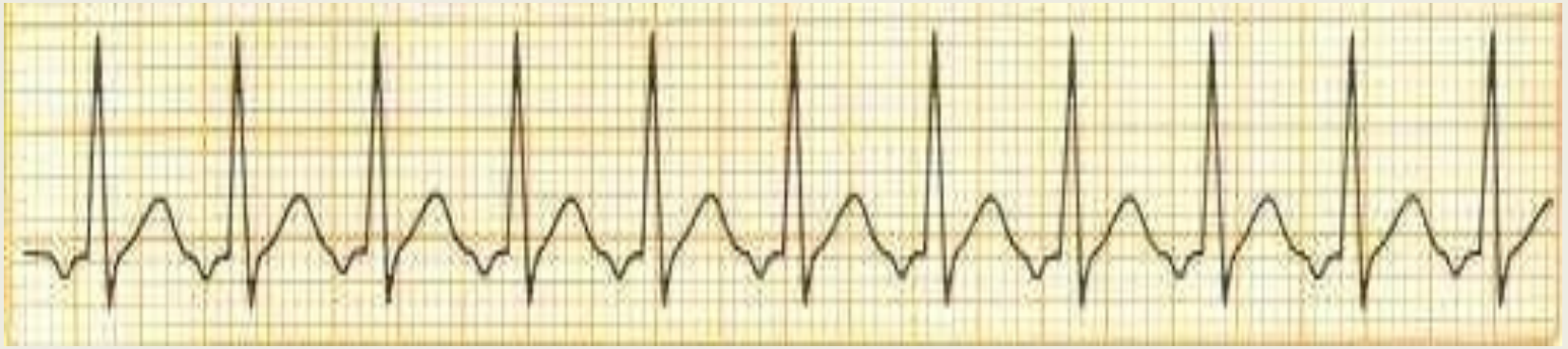
Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
Var.	Regular	Inverted, absent or after QRS	<.12	<.12

Junctional Rhythms

- Accelerated Junctional Rhythm
  - *P-wave can come before or after the QRS complex, or lost within the QRS complex*
    - *If p-waves are seen they will be inverted*
  - Rhythm is regular
  - Heart rate between 60-100 beats per minute
    - Within the normal HR range
    - Fast rate for the junction (normally 40-60 bpm)

Junctional Rhythms

Junctional Tachycardia



Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
>100	Regular	May be inverted or hidden	Short <.12	Normal <.12

Junctional Rhythms

- **Junctional Tachycardia**
  - *P-wave can come before or after the QRS complex or lost within the QRS entirely*
    - *If a p-wave is seen it will be inverted*
  - Rhythm is regular
  - Rate is between 100-180 beats per minute
    - In the tachycardia range, but not originating from SA node
  - AV node has speed up to override the SA node for control of the heart

Junctional Rhythms

Junctional Escape

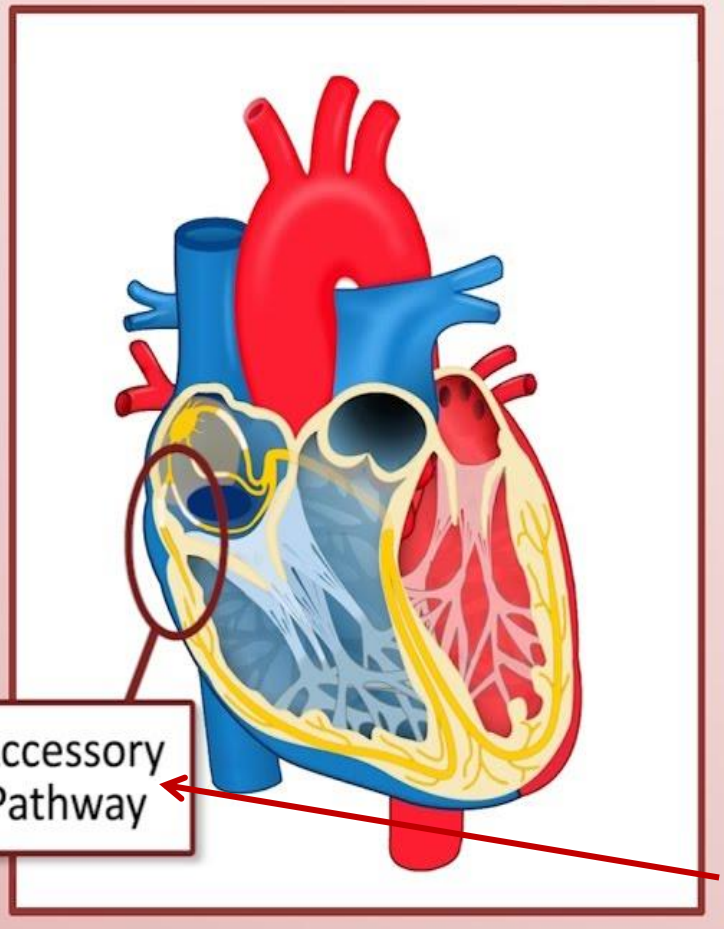
Heart Rate	Rhythm	P Wave	PR Interval (sec.)	QRS (Sec.)
40 – 60	Regular	Absent, inverted or after QRS	Short <.12	Normal <.12

Junctional Rhythms

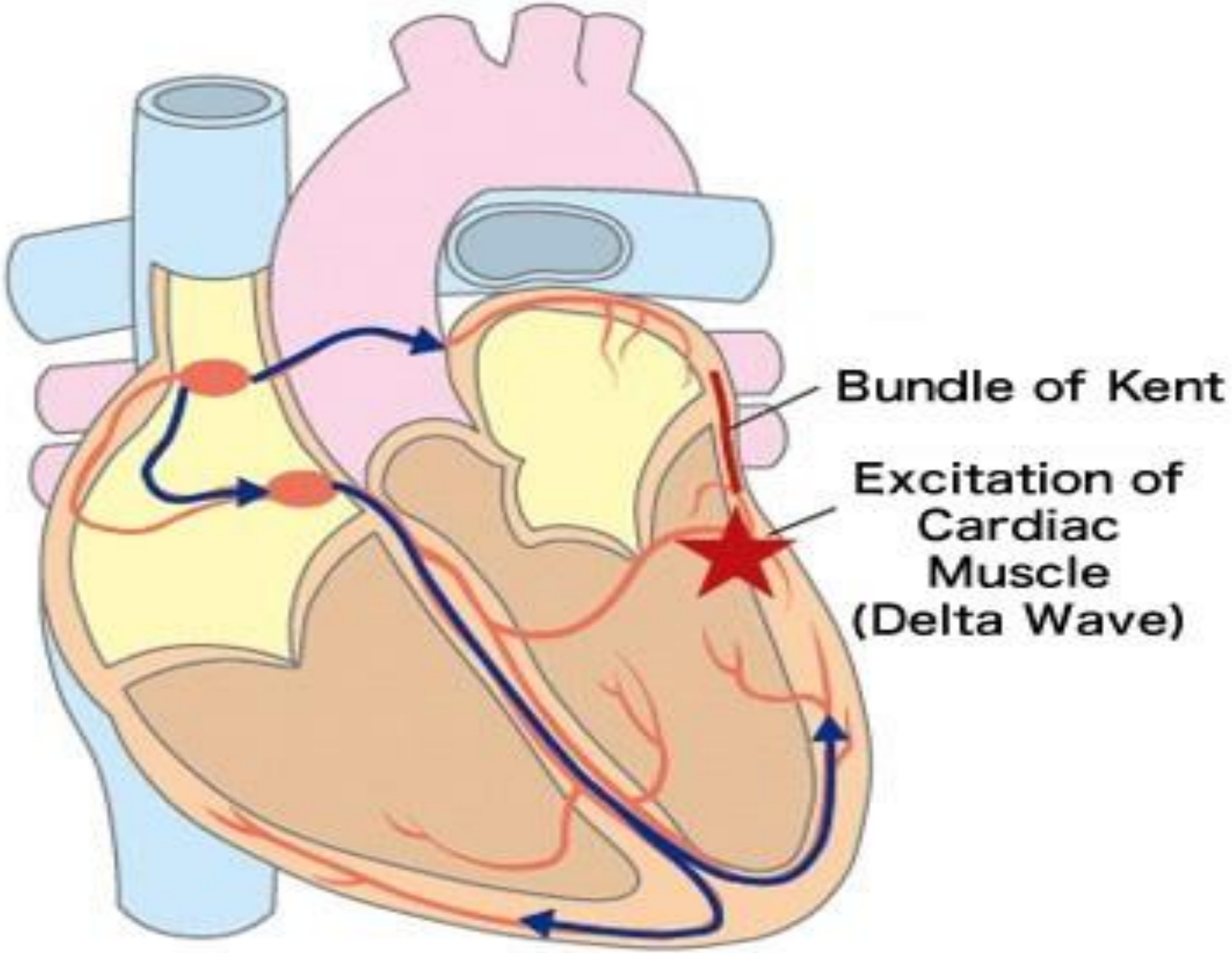
- Junctional Escape Rhythm
  - *P-wave may come before or after the QRS or may be hidden in the QRS entirely*
    - *If p-waves are seen, they will be inverted*
  - *Rhythm is regular*
  - *Rate 40-60 beats per minute*
    - The SA node has failed; the AV junction takes over control of the heart

Wolf –Parkinson-White syndrome (WPW Syndrome)

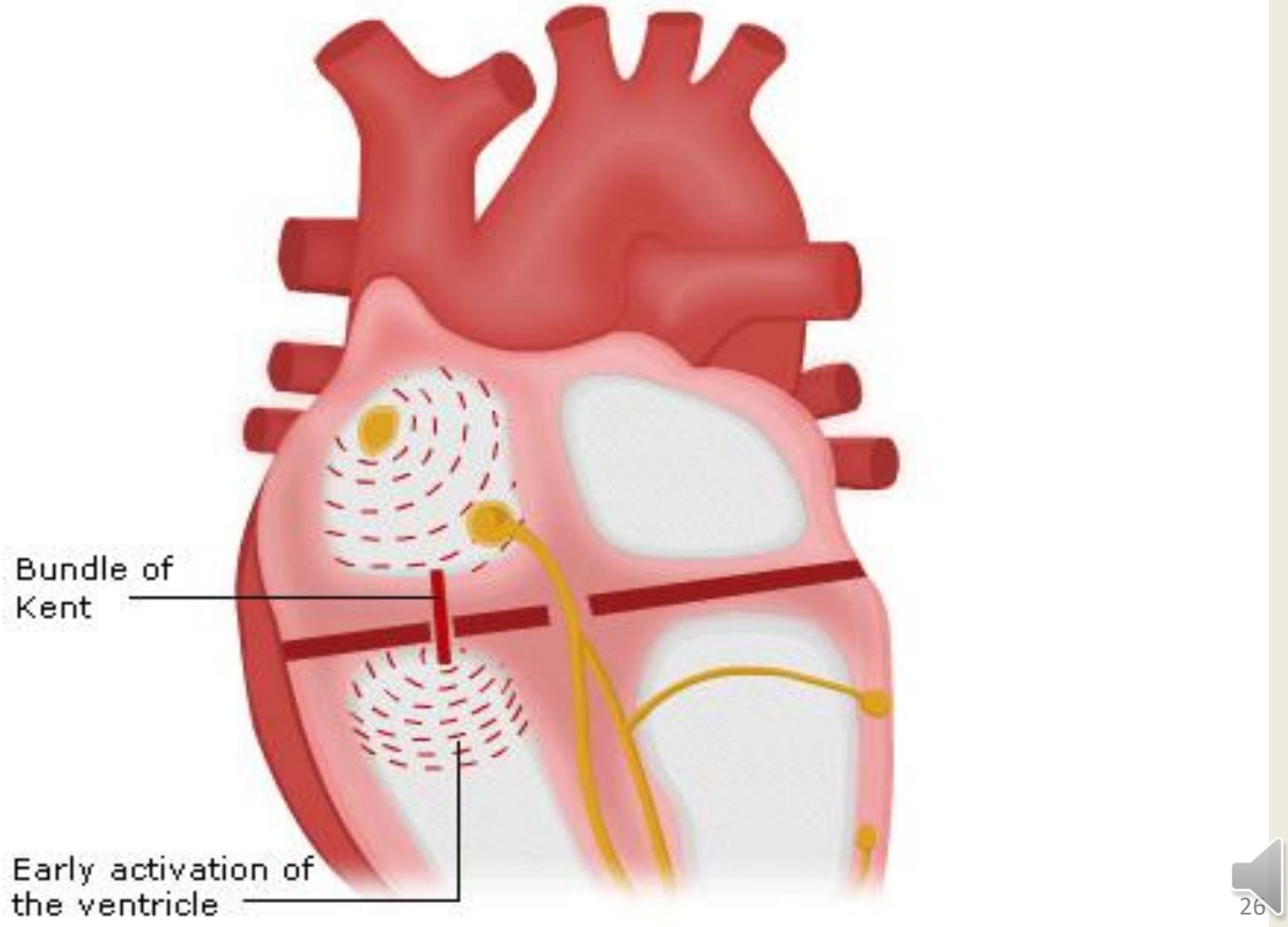
What is Preexcitation?



Bundle of Kent


Bundle of Kent
Excitation of Cardiac Muscle (Delta Wave)

Bundle of Kent, pre-excitation



Wolf –Parkinson-White syndrome (WPW Syndrome)

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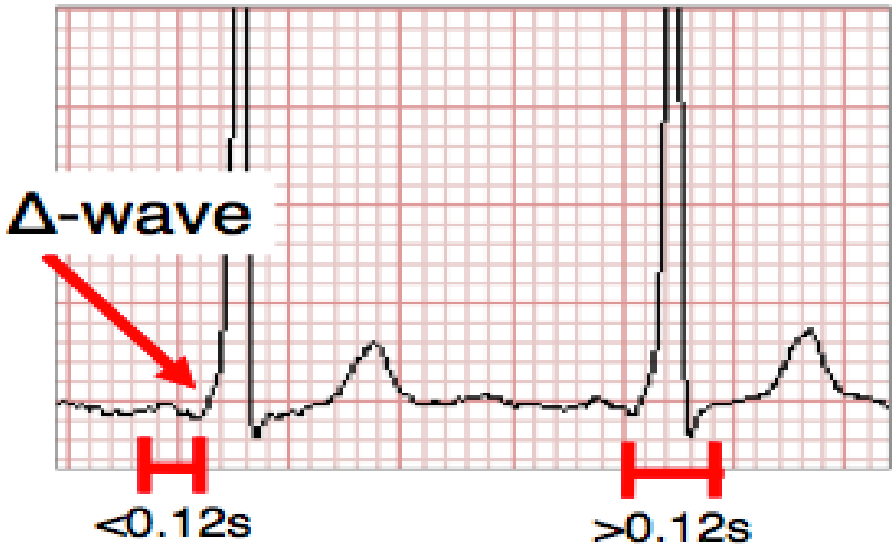
EMERGENCY MEDICINE

Wolff-Parkinson-White (WPW) or "Pre-Excitation Syndrome"

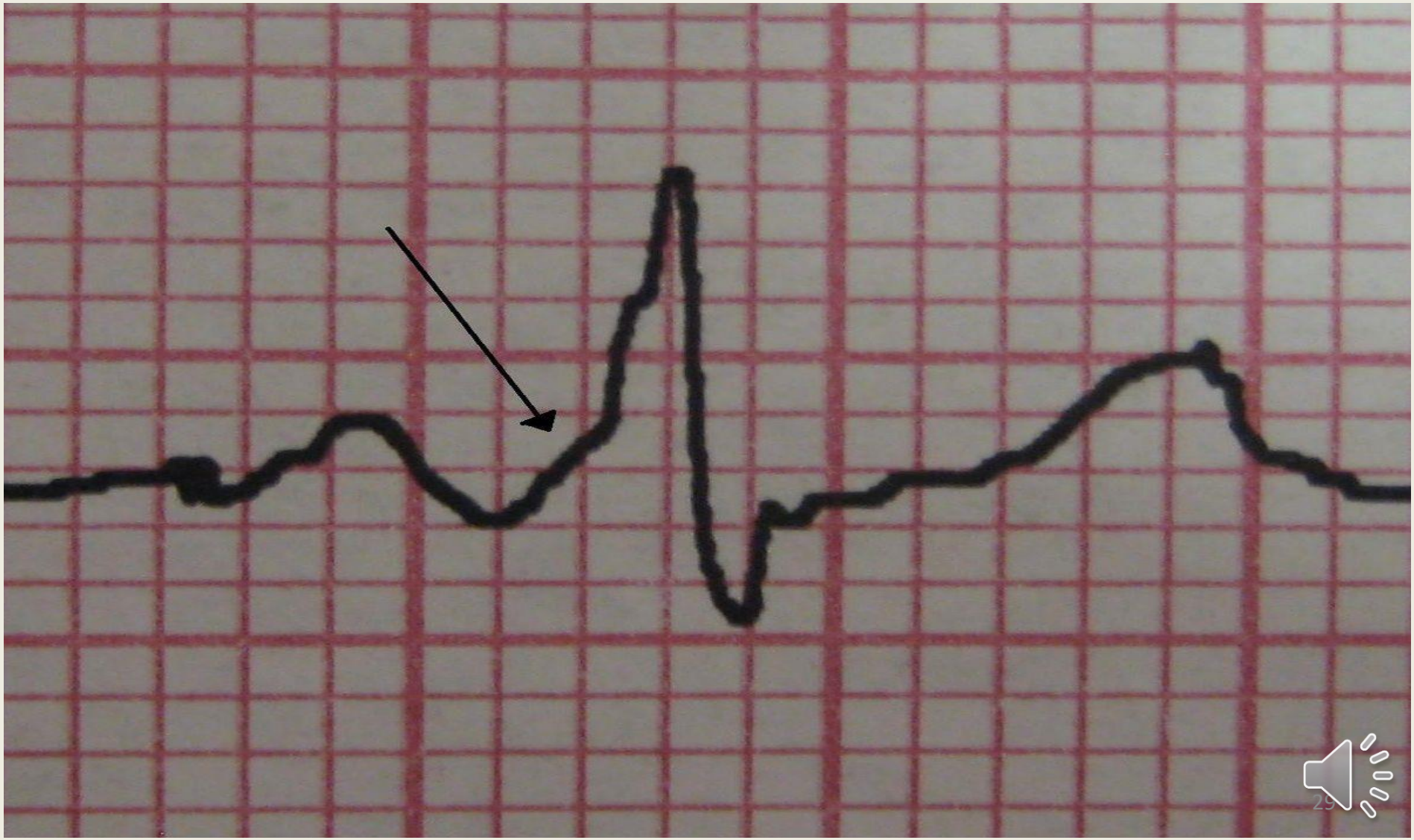


- short PR interval
- "delta" wave
- lengthened QRS
- terminal QRS normal (compared to LBBB, eg)

WPW Syndrome

Wolff-Parkinson-White Syndrome

Wolf –Parkinson-White syndrome (WPW Syndrome)



THANK YOU