



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Evaluation of Narrow-Complex Tachycardia

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Objectives

- Summarize the different mechanisms of narrow complex tachycardia.
- Describe the utilization of medical and interventional treatments for different mechanisms of narrow complex tachycardia.
- Describe which types of supraventricular tachycardia require anticoagulation.

Narrow-Complex Tachycardia

Supraventricular Arrhythmia

- With normal ventricular conduction = wide complex
- With aberrant ventricular conduction = narrow complex

Narrow-Complex Tachycardia

Mechanism and management of:

- AF/AFL

- AVNRT

- WPW

- AT

PSVT

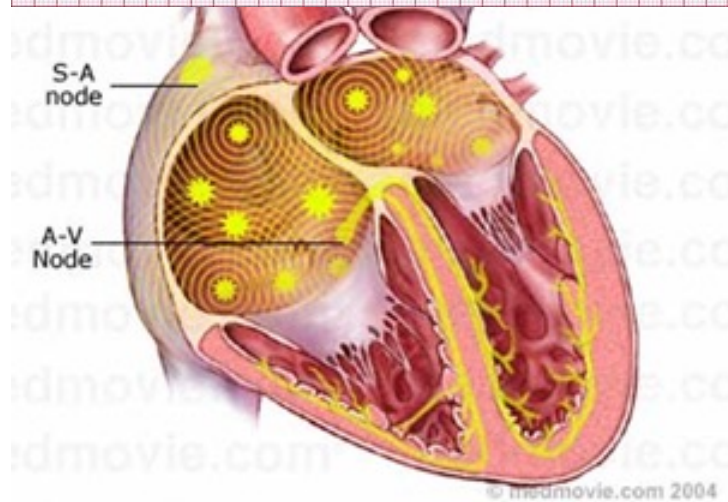


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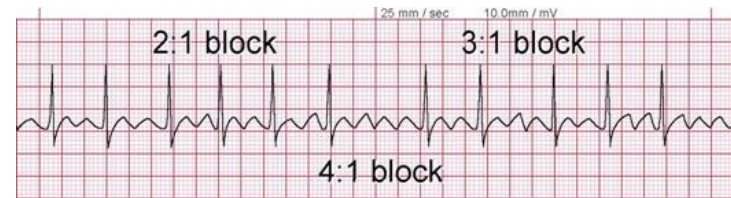
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Atrial Fibrillation and Atrial Flutter

Atrial Fibrillation



Atrial Flutter



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Typical = isthmus dependent
Atypical = non-isthmus dependent

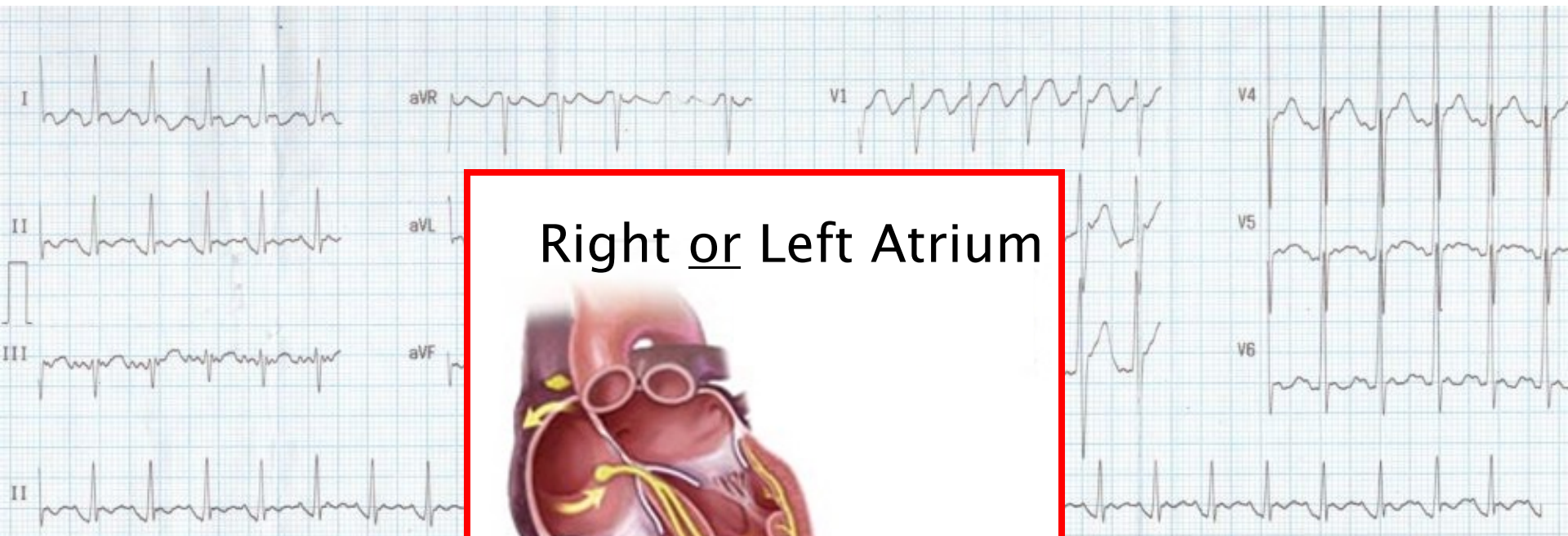
What is this?



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Atypical Atrial Flutter



Right or Left Atrium



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Management of AF/AFL

Anticoagulation

- Based on CHADS2VASC score
- Consider bleed risk (HAS BLED score)
- Burden of arrhythmia not necessarily a factor

Rate or Rhythm control

- Based on burden of symptoms
- Asymptomatic: rate control
- Symptomatic despite good rate control (or good rate control not possible to achieve): rhythm control



Management of AF/AFL

Catheter ablation for AF

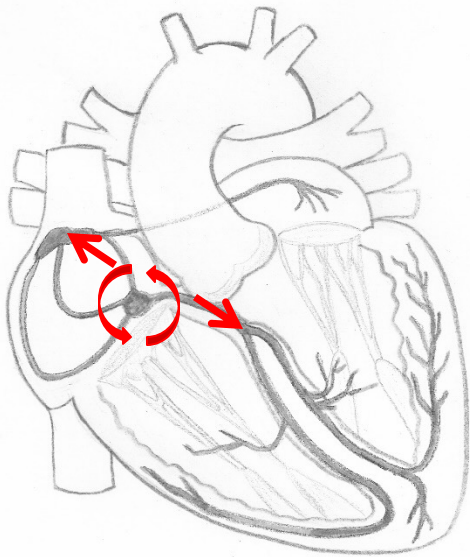
- 70% success rate for paroxysmal AF
- <70% success rate for persistent AF
- Considered for patients who have failed a trial of AADs

Catheter ablation for AFL

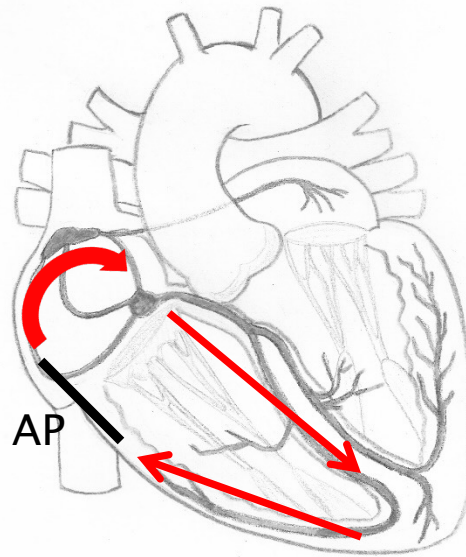
- For “isthmus dependent” AFL, ablation is first line therapy (>90% success rate)
- For “non-isthmus dependent” AFL, ablation management strategy mirrors that for AF

Types of PSVT

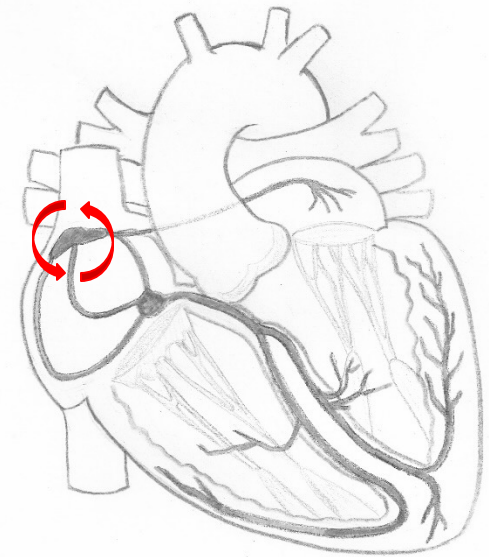
AVNRT: 60%



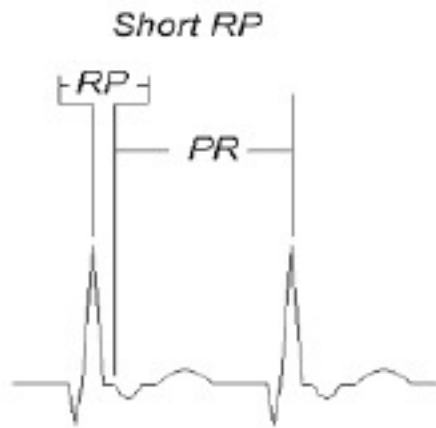
WPW: 30%



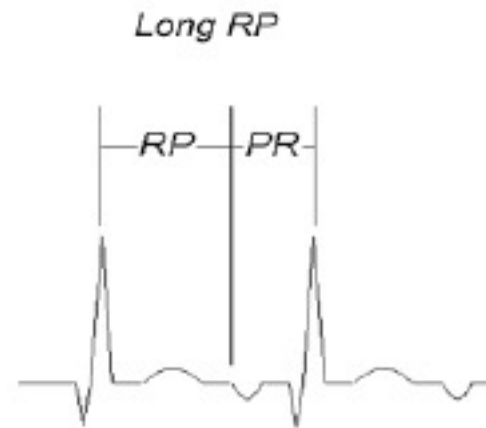
AT: 10%



PSVT Classification by RP Interval



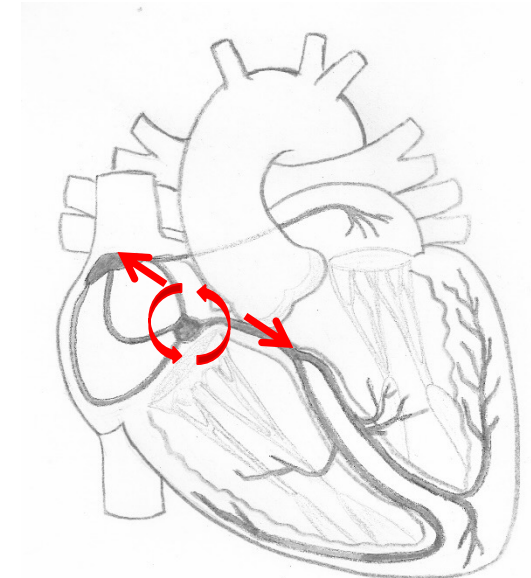
Typical AVNRT
JET
AVRT



Sinus Tachycardia
Atrial Tachycardia
Atypical AVNRT
AVRT

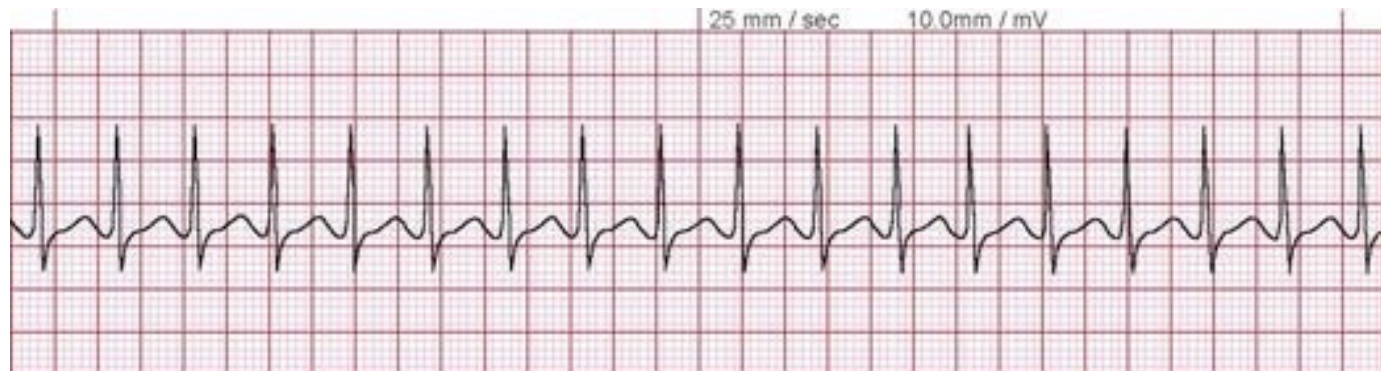
AVNRT

- Most common type of PSVT
- Responds to AV node blockers
- Responds to increase in vagal tone (maneuvers)
- CCB, BB, even digoxin can be used chronically
- Responds to adenosine acutely
- Catheter ablation >95% successful

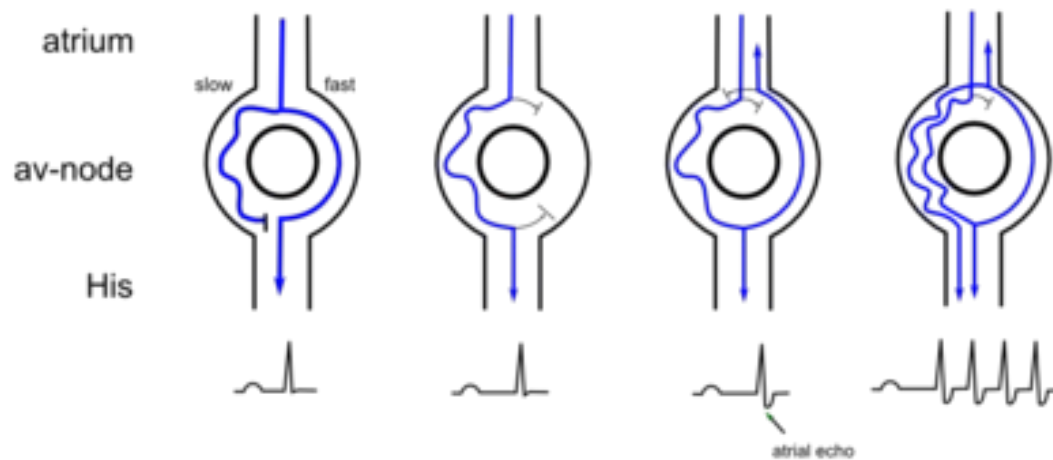


AVNRT

- Most common type of PSVT
- Responds to AV node blockers
- CCB, BB, even digoxin can be used chronically
- Responds to adenosine acutely
- Catheter ablation >95% successful



AVNRT: Mechanism



ECG-PEDIA.ORG



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AVNRT: ECG Characteristics

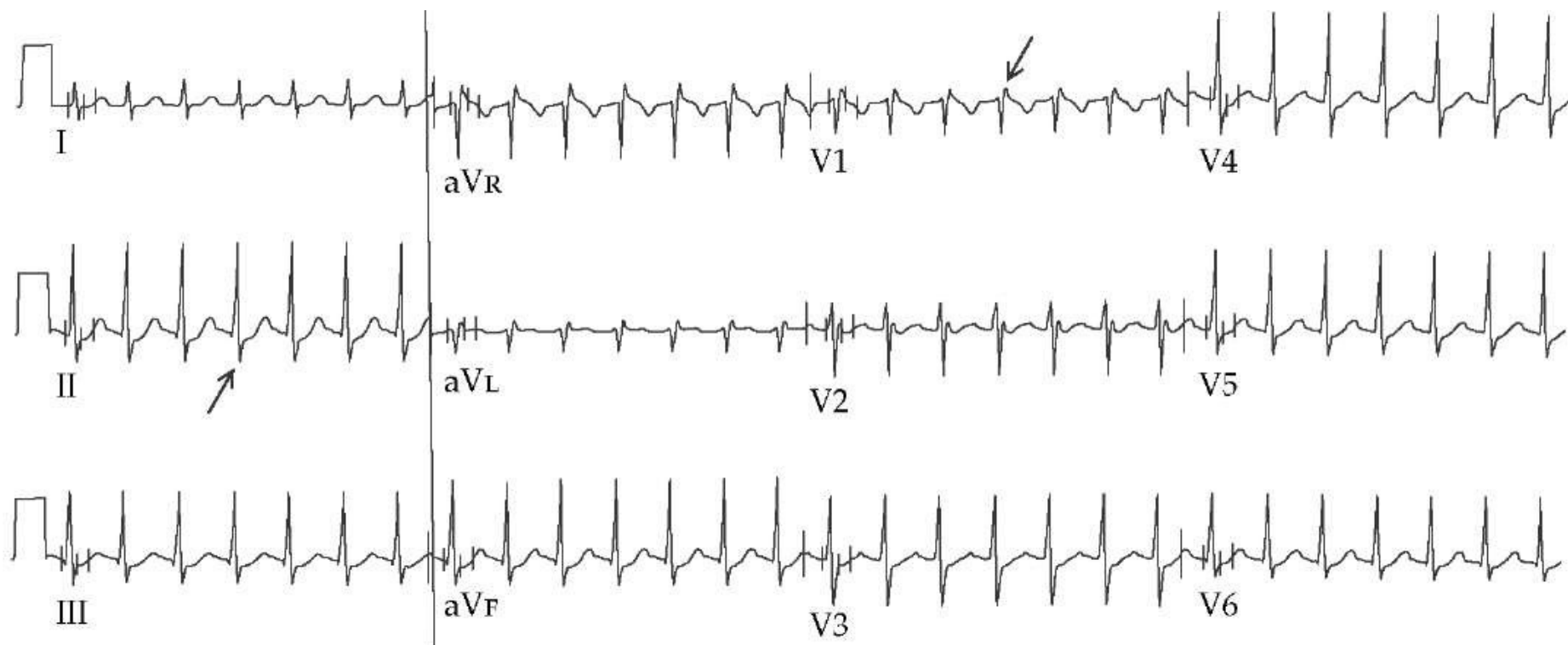
Sinus rhythm

- no delta wave

Tachycardia

- No P wave or RP interval less than 80-90 msec
- Pseudo R wave in V1
- Episode of tachycardia terminates with an “A”

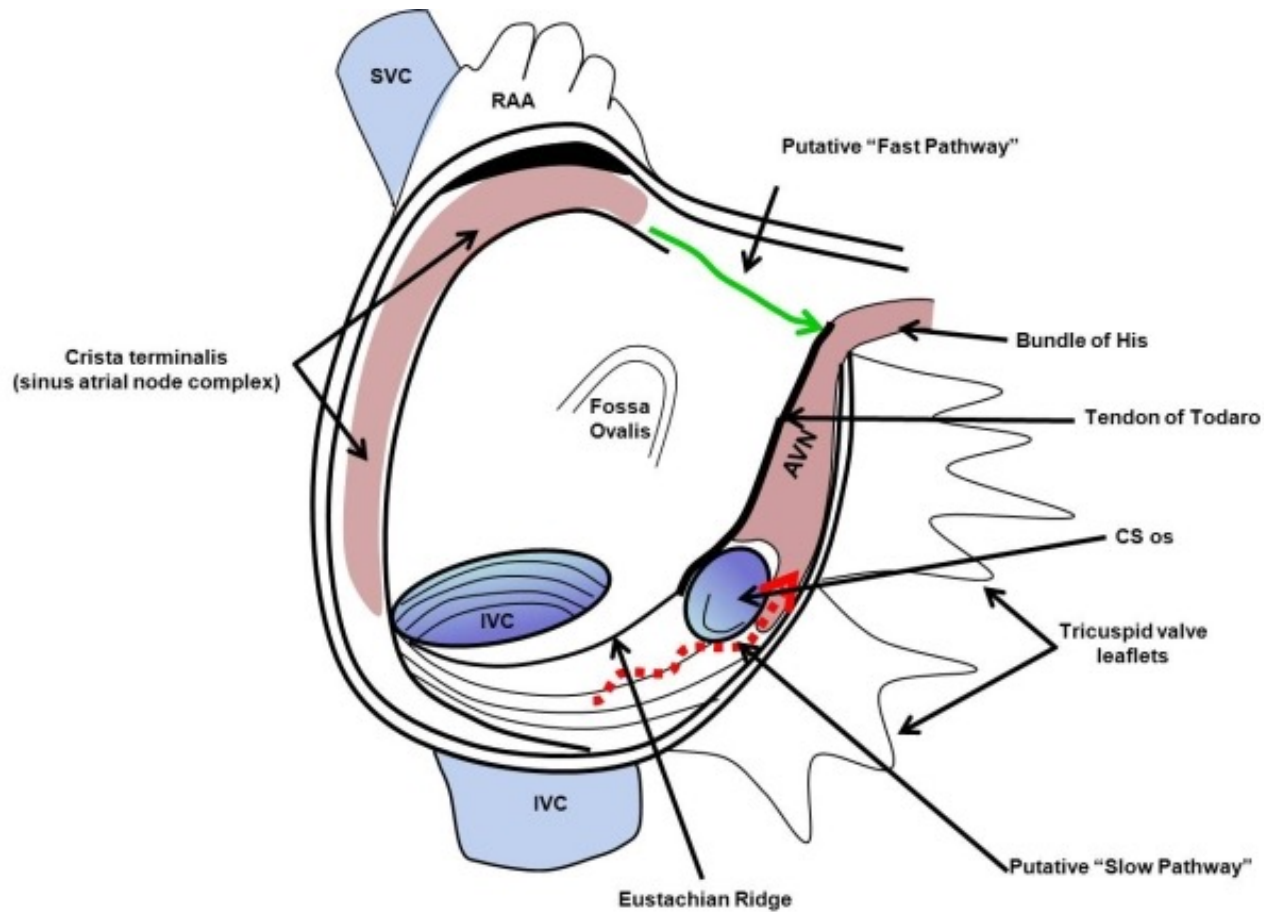
AVNRT: 12-Lead ECG



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AVNRT: Anatomic Substrate



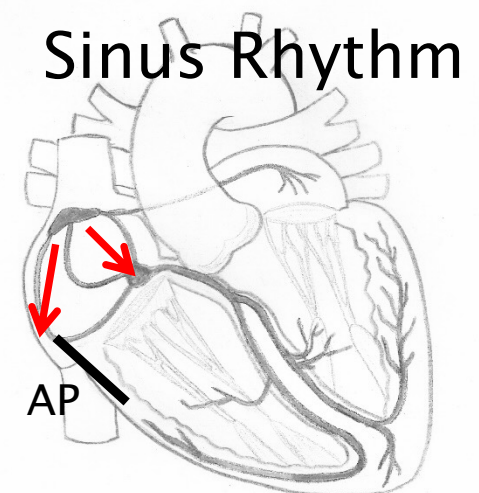
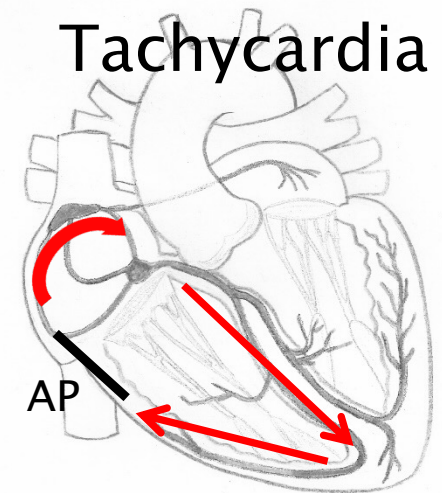
Ablation is >90% effective

Either medications or ablation is first-line therapy

- Ablation for patients who do not wish to take medications
- Ablation for patients who are intolerant of medications or whose arrhythmia recurred on medications

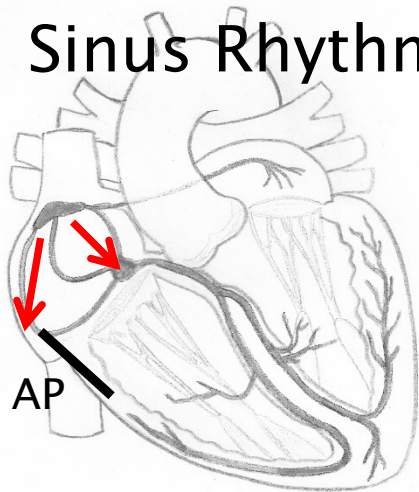
WPW Syndrome

- Symptomatic tachycardia
- Short PR interval in sinus rhythm
 - <120 ms, not always present
- Delta wave in QRS complex
 - Prolonged QRS complex, >120 ms
 - Indication of antegrade conduction via accessory pathway
- Respond to adenosine and AV nodal blockers
- Present in 2/1000 people
- Catheter ablation successful ($>90\%$)

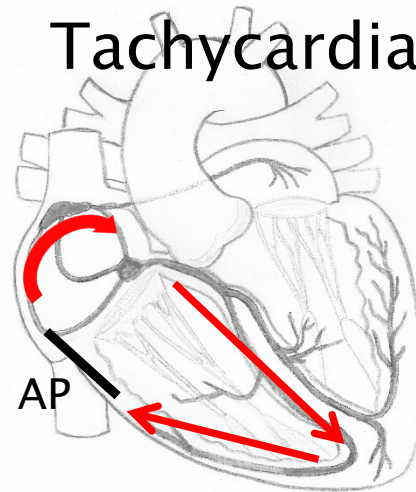


WPW Syndrome

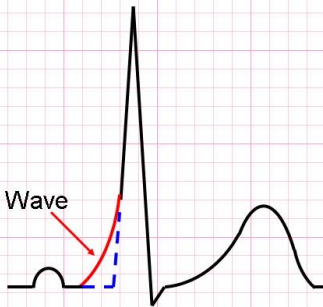
Sinus Rhythm



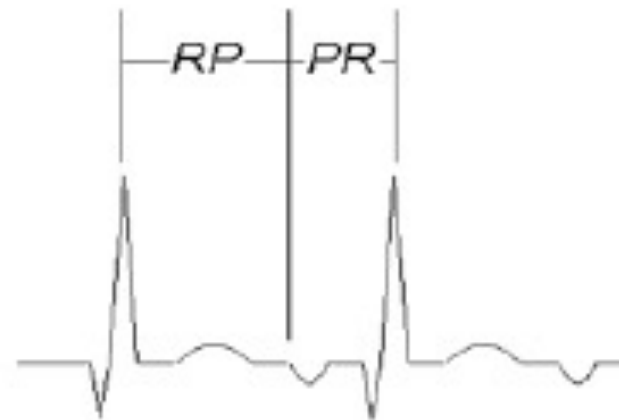
Tachycardia



Delta Wave



Long RP



Concealed vs Manifest Accessory Pathway

WPW

- Delta wave present in sinus rhythm
- Tachycardia:
 - Narrow-complex/orthodromic: retrograde AP conduction
 - Wide-complex/antidromic: antegrade AP conduction

Concealed Accessory Pathway

- No pre-excitation in sinus rhythm
- Tachycardia:
 - Narrow-complex/orthodromic: retrograde AP conduction



WPW Management

70% of patients with WPW present with tachycardia

- 70% of these have PSVT (mostly ORT, 5% ART)
- 30% have atrial fibrillation

Symptomatic patients

- EP study to risk stratify and to cure with ablation

Asymptomatic patients

- No indication for risk stratification or EP study unless the patient is in a high-risk occupation

WPW Medical Management

Acute PSVT

- Vagal maneuvers
- Verapamil
- Adenosine
- Do not give adenosine to patients with WPW who present with AF RVR

Prevention of PSVT

- BB, CCB
- AADs

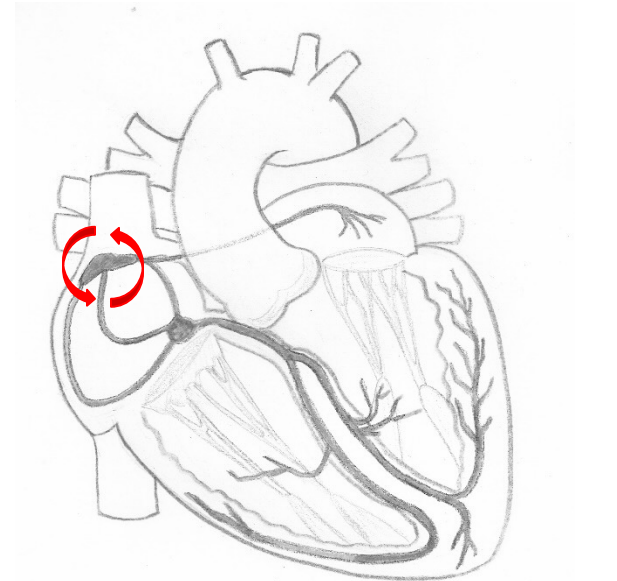
WPW: Medical Management

Atrial Fibrillation

- Do not give digoxin, BB, CCB, adenosine
 - These can block the AV node and not the AP and thus increase the ventricular response
- Classic: administer procainamide or ibutilide or perform DCCV

Atrial Tachycardia

- ECG in sinus rhythm normal
- Tachycardia reveals:
 - Long RP interval
 - P wave morphology different
 - Terminates with “V”
- Treatment:
 - Same as AVNRT



Adenosine

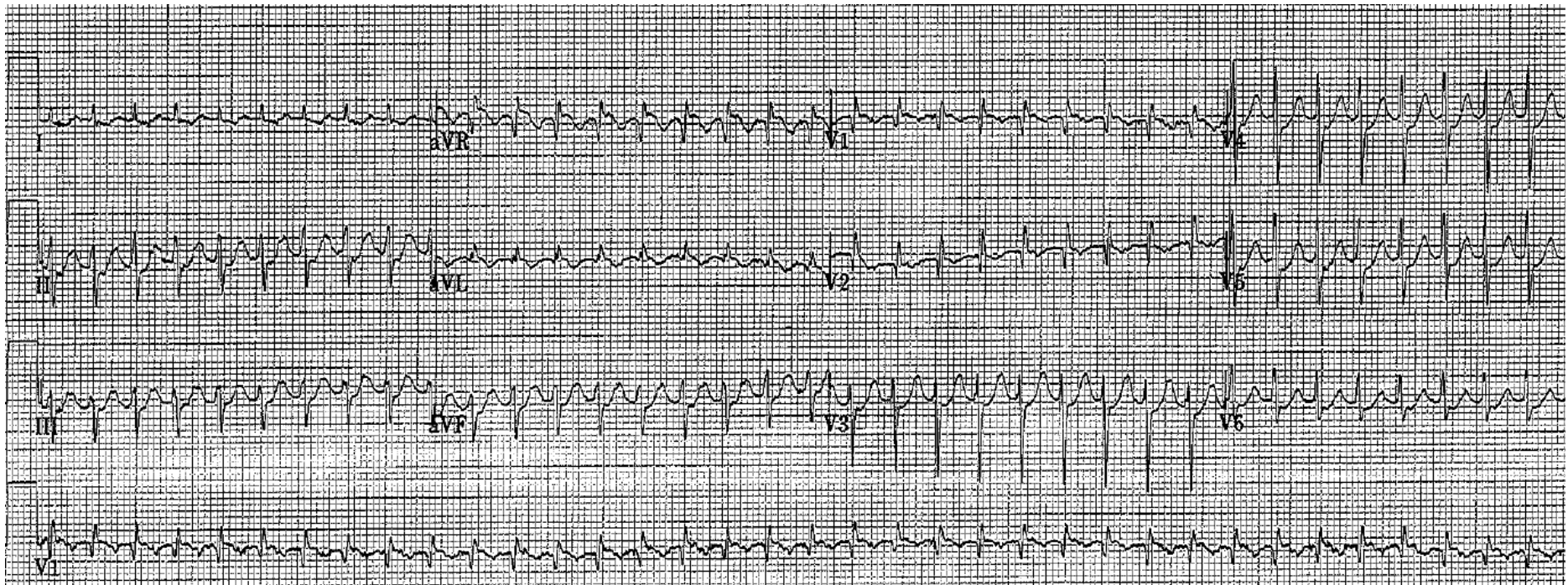
Terminates tachycardia?

- Suggests that SVT is present

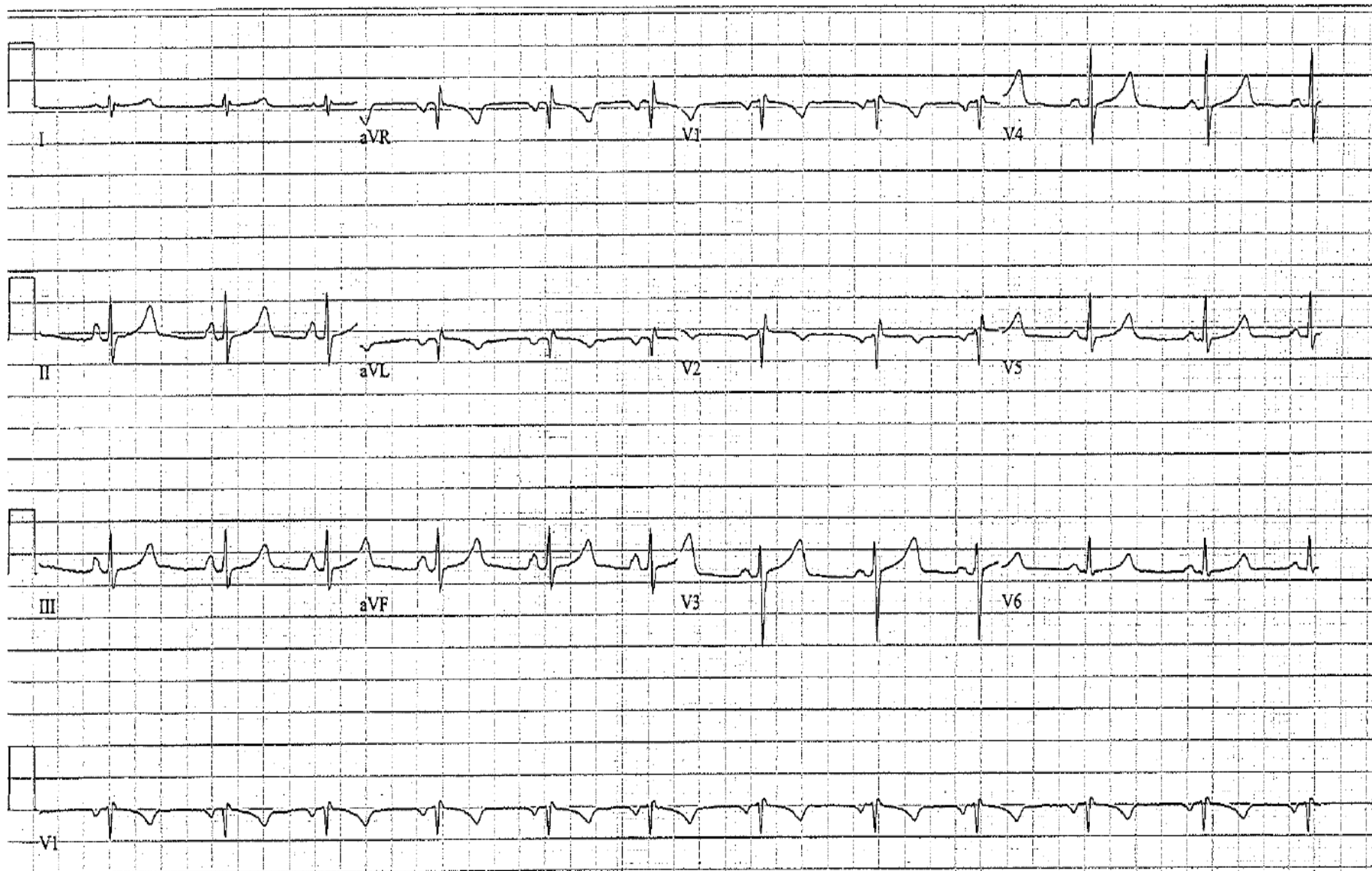
Does not terminate tachycardia?

- Rule out failure to administer adequate dose or presence of methylxanthines
- If the arrhythmia is wide complex, failure of adenosine to terminate suggests diagnosis of VT
- Do not administer in WCT with irregularly irregular R-R intervals suggesting AF (cannot rule out WPW with AF)

Question 1: Tachycardia



Question 1: Baseline, Sinus Rhythm



Question 1

What is the most likely mechanism of the tachycardia?

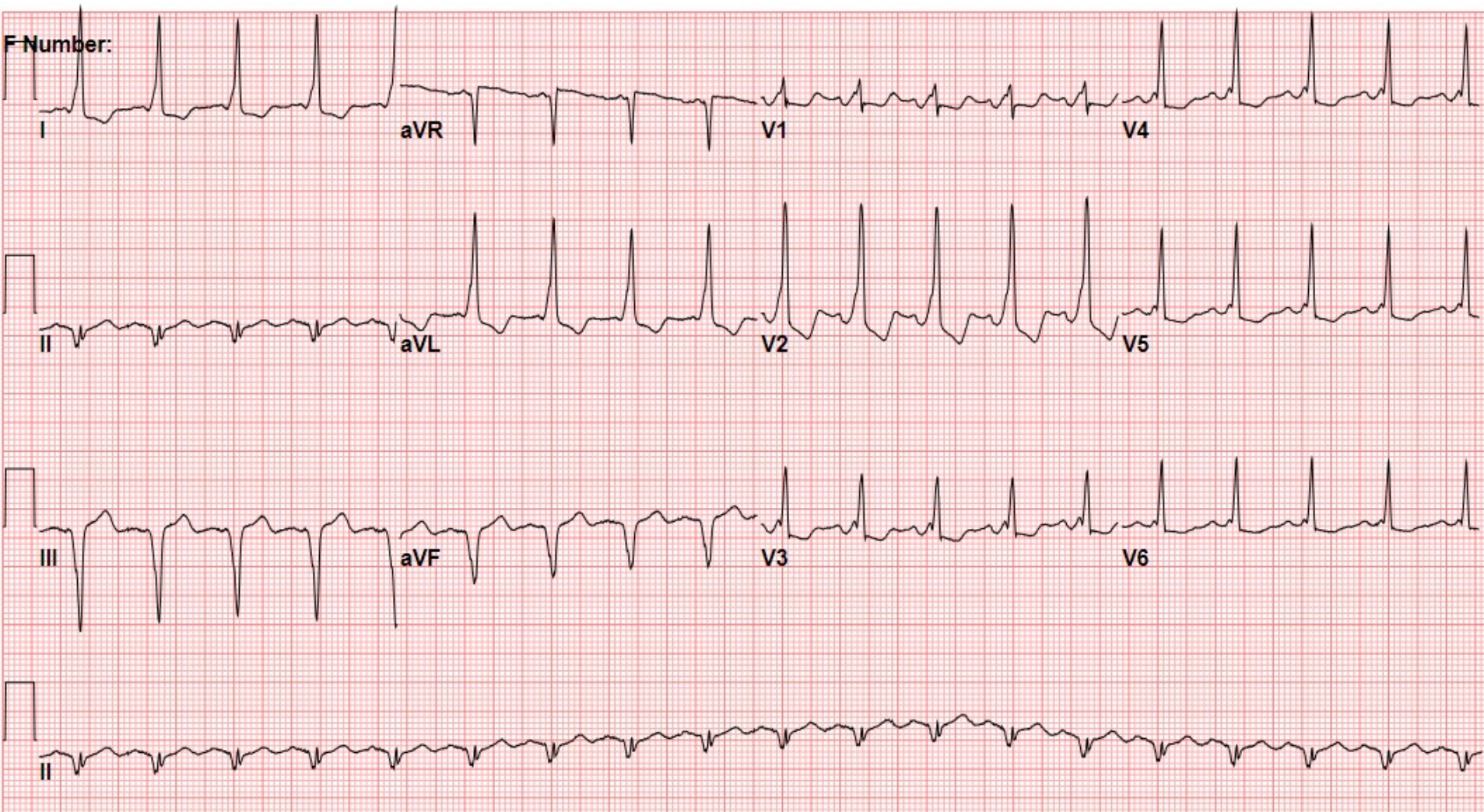
1. Atrial tachycardia (AT)
2. Atrioventricular tachycardia (AVRT)
3. Atrial flutter (AFL)
4. Atrioventricular nodal tachycardia (AVNRT)

Question 1

What is the most likely mechanism of the tachycardia?

1. Atrial tachycardia (AT)
2. Atrioventricular tachycardia (AVRT)
3. Atrial flutter (AFL)
4. **Atrioventricular nodal tachycardia (AVNRT)**

Question 2



Question 2

What is responsible for the ventricular activation pattern observed on this ECG?

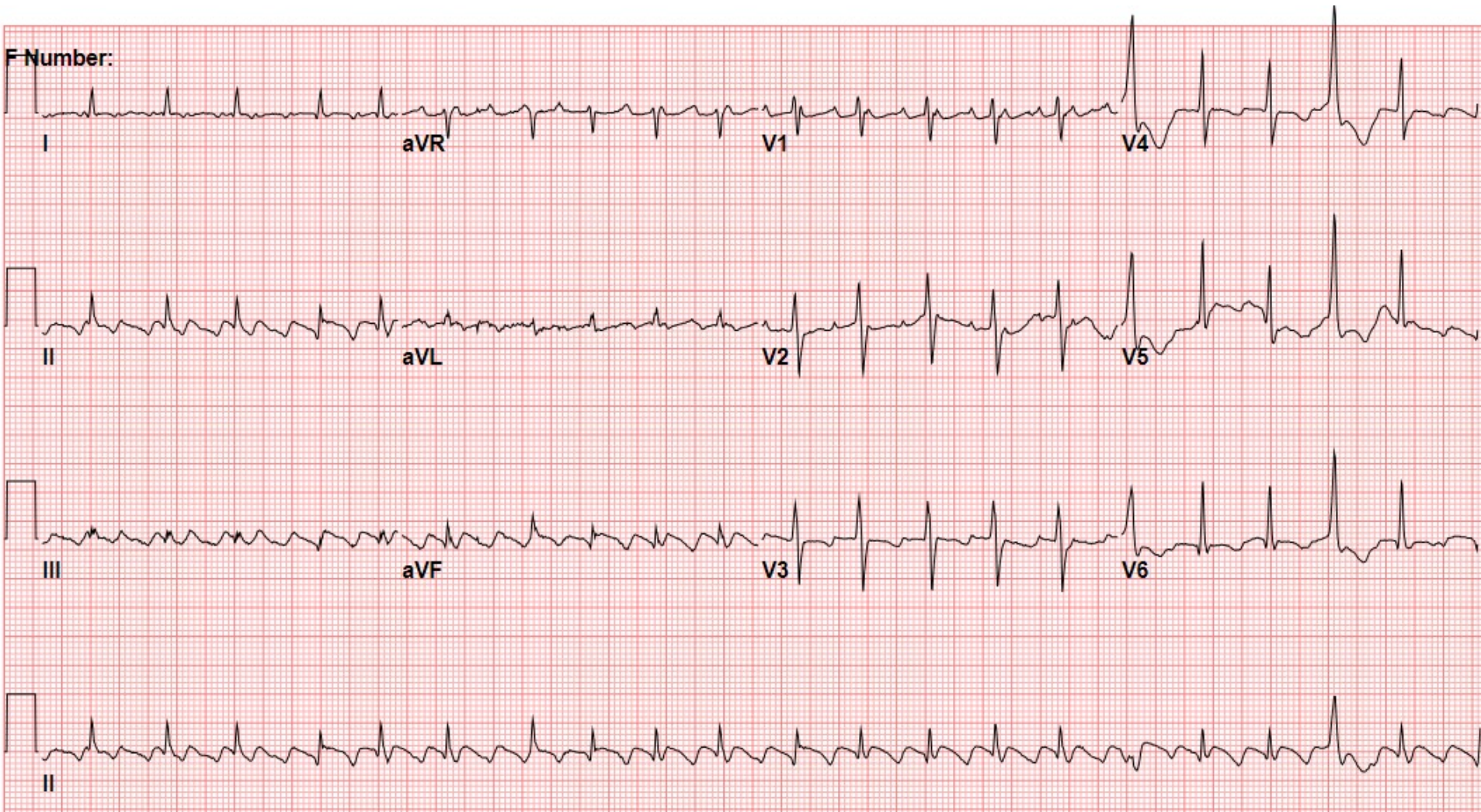
1. Conduction via the AV node with delayed conduction in the His-Purkinje system.
2. Accelerated conduction via the AV node with delayed conduction in the His-Purkinje system.
3. Simultaneous antegrade conduction via the AV node and an atrioventricular accessory pathway.

Question 2

What is responsible for the ventricular activation pattern observed on this ECG?

1. Conduction via the AV node with delayed conduction in the His-Purkinje system.
2. Accelerated conduction via the AV node with delayed conduction in the His-Purkinje system.
3. **Simultaneous antegrade conduction via the AV node and an atrioventricular accessory pathway.**

Question 3



Question 3

What is the mechanism of this arrhythmia

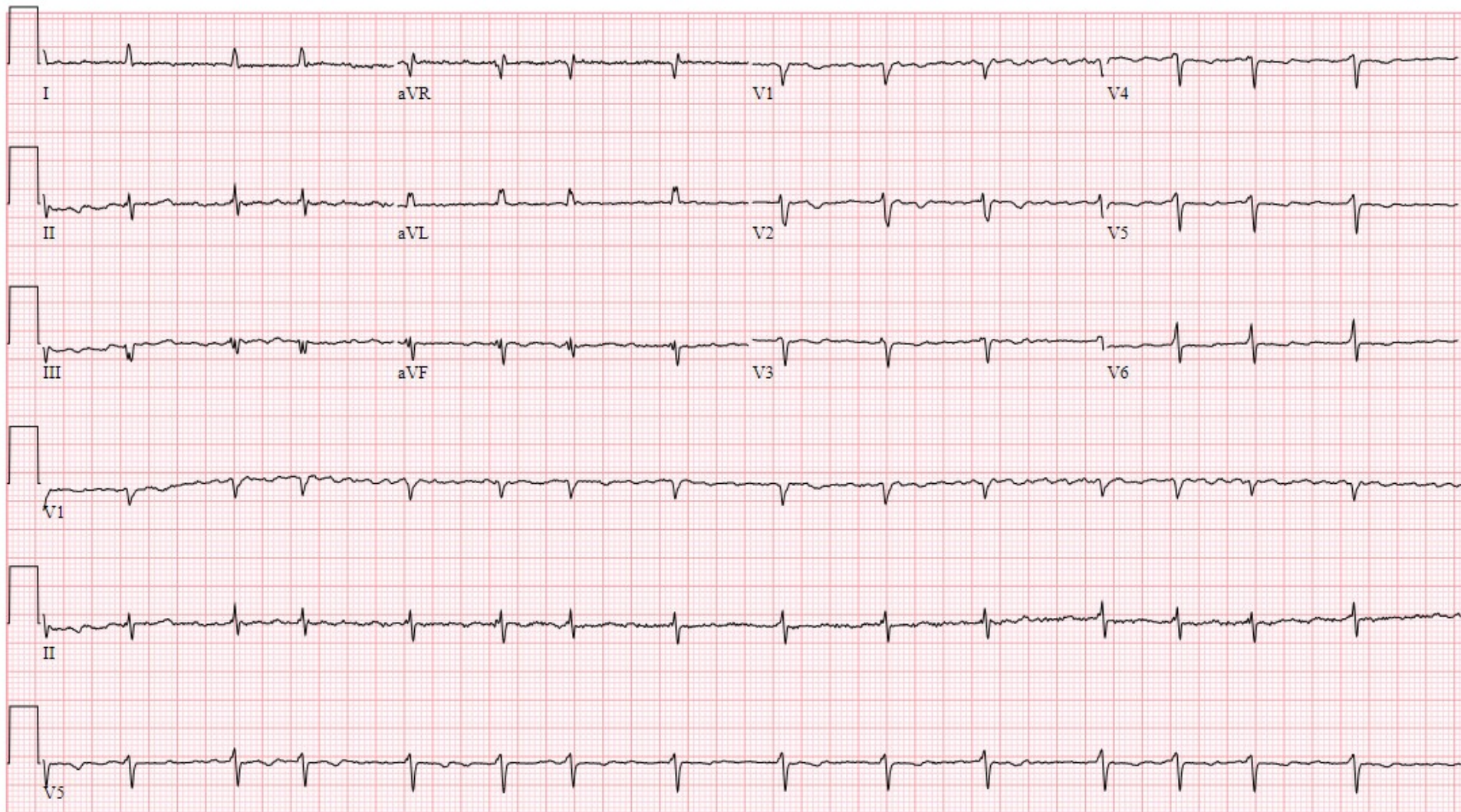
1. Atrial tachycardia
2. Typical atrial flutter
3. Atypical atrial flutter
4. Atrial fibrillation

Question 3

What is the mechanism of this arrhythmia

1. Atrial tachycardia
2. **Typical atrial flutter**
3. Atypical atrial flutter
4. Atrial fibrillation

Question 4



Question 4

What is the mechanism of this arrhythmia

1. Atrial tachycardia
2. Typical atrial flutter
3. Atypical atrial flutter
4. Atrial fibrillation

Question 4

What is the mechanism of this arrhythmia

1. Atrial tachycardia
2. Typical atrial flutter
3. Atypical atrial flutter
4. **Atrial fibrillation**

Thank you



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