Management of SVT: Feel the Burn

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HEART RHYTHM SYMPOSIUM

Disclosures

- Speaker
  - BiosenseWebster
  - Bristol-Myers Squibb
  - Janssen
  - Pfizer
  - St Jude Medical
- Advisory Board
  - Boston Scientific

Agenda

- Definitions/Diagnosis
- Acute Treatment
- Long-Term Therapy

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CLINICAL PRACTICE GUIDELINE

2015 ACC/AHA/HRS Guideline for the Management of Adult Patients With Supraventricular Tachycardia

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society

2015 ACC/AHA/HRS SVT Guidelines
J Am Coll Cardiol. 2016;67(13):e27-e115.

HEART RHYTHM SYMPOSIUM

Atrial Fibrillation

Typical Atrial Flutter

Atypical Atrial Flutter

Inappropriate Sinus Tachycardia

Supraventricular Tachycardia?

Multifocal Atrial Tachycardia

AV Nodal Reentry (AVNRT)

Atrial Tachycardia

Atrial Ventricular Tachycardia (AVRT)

Definition

SVT: An umbrella term used to describe tachycardias, the mechanism of which involves tissue from the His bundle or above

- Inappropriate sinus tachycardia

Paroxysmal Supraventricular Tachycardia (PSVT):

A clinical syndrome characterized by the presence of a regular and rapid tachycardia of *abrupt onset and termination*

- AVNRT (AV nodal reentrant tachycardia)
- AVRT (Atrio-ventricular reentrant tachycardia)
- Atrial tachycardia (focal/ectopic)

Inappropriate Sinus Tachycardia

- Sinus heart rate >100 bpm at rest, with a mean 24-h heart rate >90 bpm not due to appropriate physiological responses or primary causes such as hyperthyroidism or anemia
- Beta blockers, calcium channel blockers are first line, but generally poorly tolerated
- Ivabradine is an inhibitor of the “I-funny” or “If” channel, which is responsible for normal automaticity of the sinus node; therefore, ivabradine reduces the sinus node pacemaker activity

Atrial Fibrillation

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Atypical Atrial Flutter

Inappropriate Sinus Tachycardia

Paroxysmal Supraventricular Tachycardia

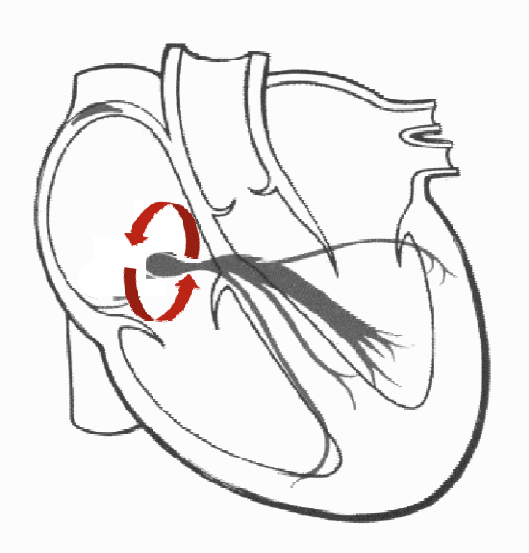
Multifocal Atrial Tachycardia

AV Nodal Reentry (AVNRT)

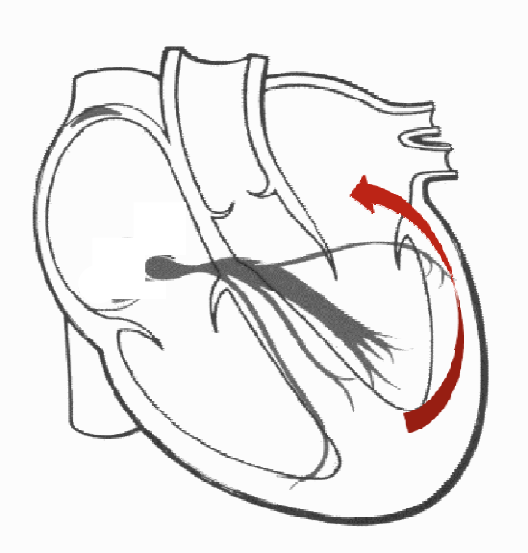
Atrial Tachycardia

Atrial Ventricular Tachycardia (AVRT)

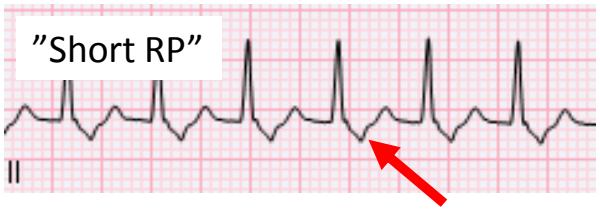
pSVT Mechanisms

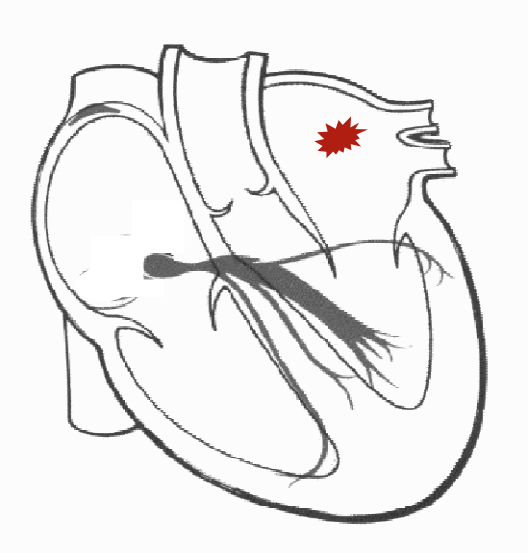


AV Nodal Reentrant Tachycardia (AVNRT)

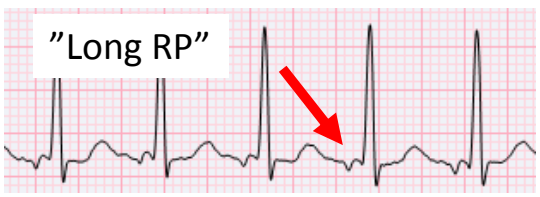


AV Reentrant Tachycardia (AVRT)

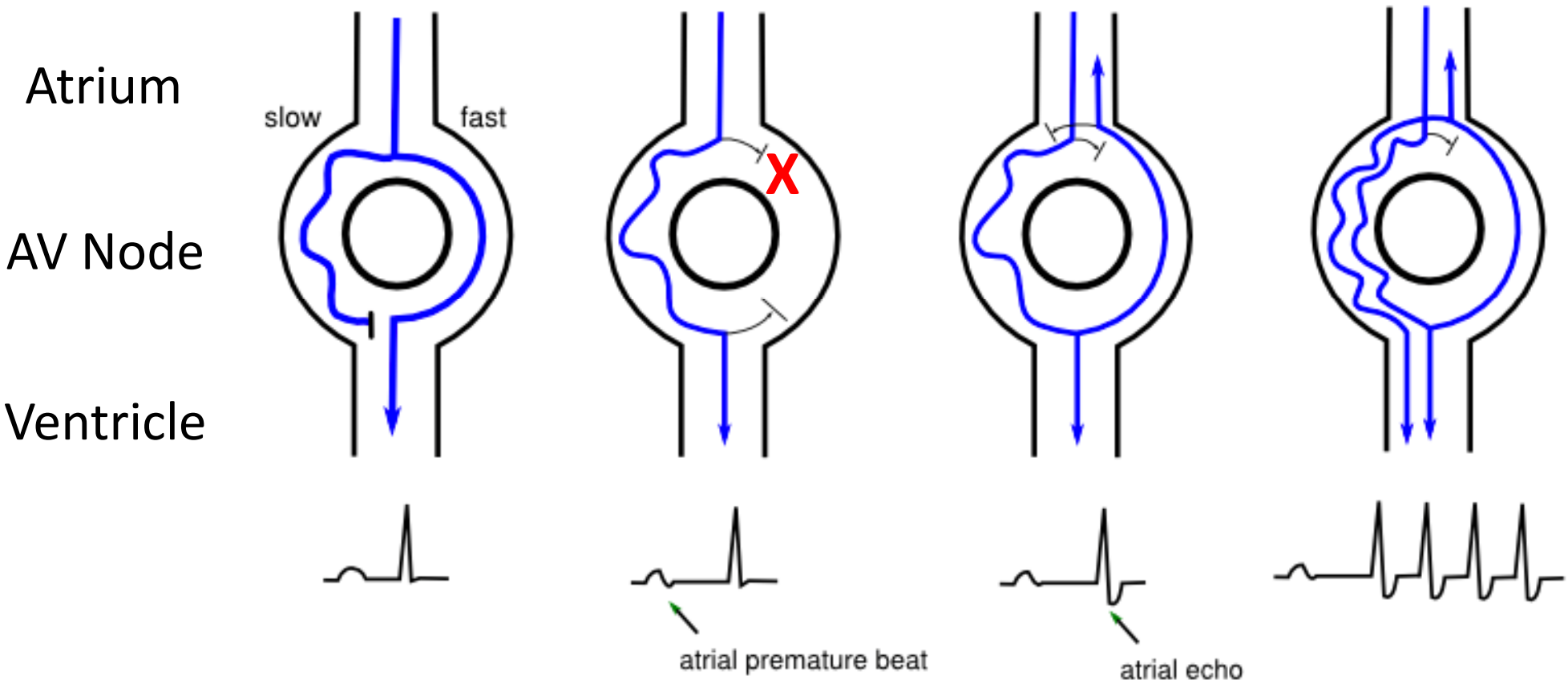




Atrial Tachycardia

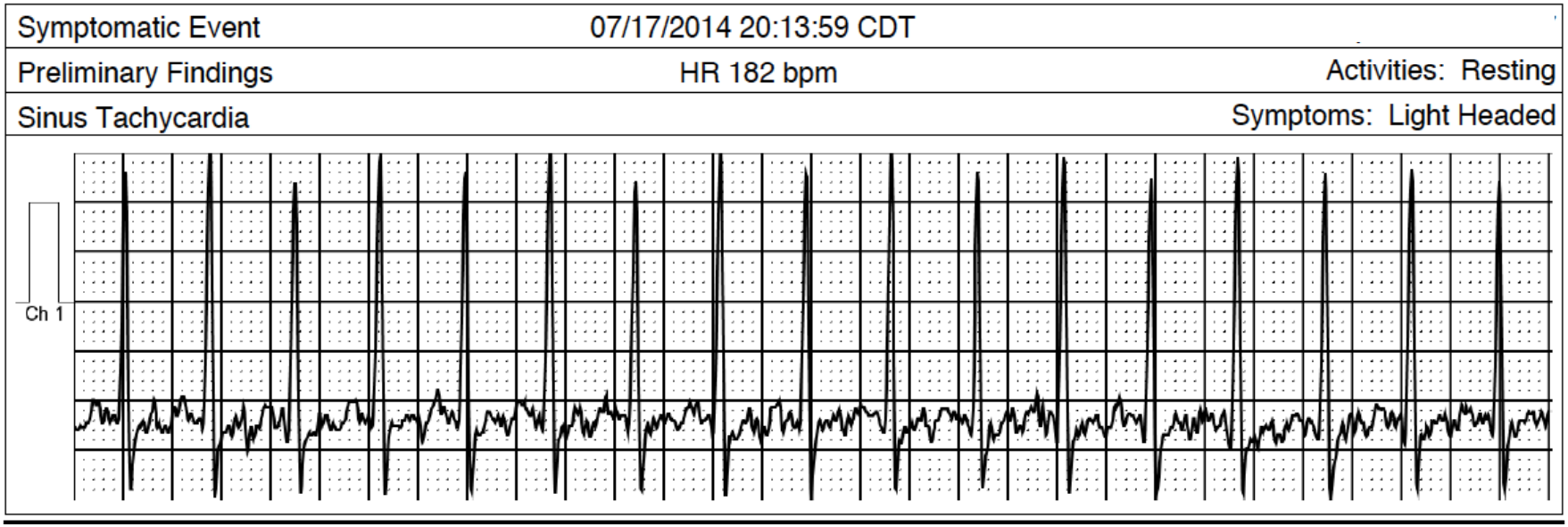


Reentry Mechanism



Question 1

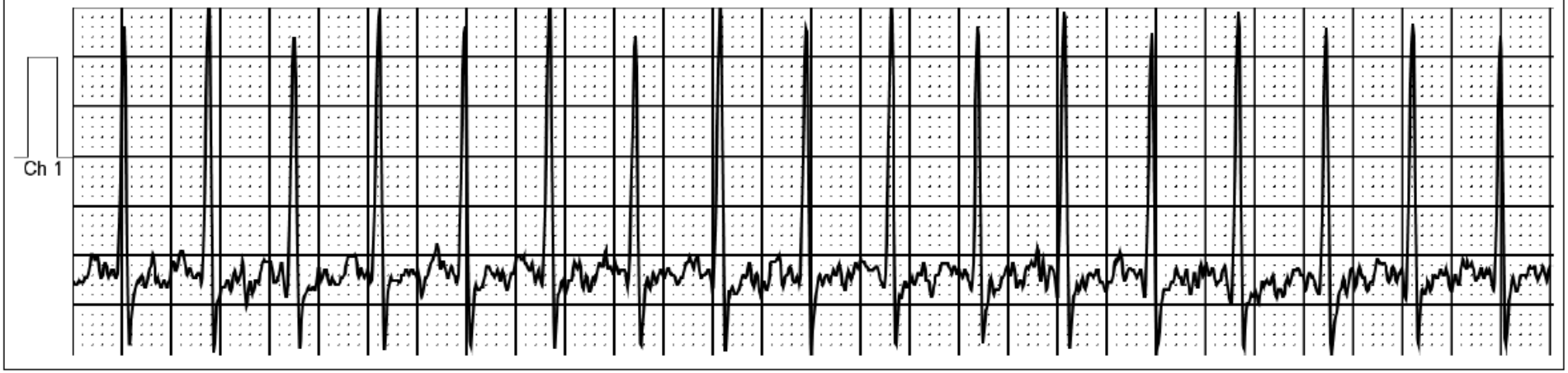
- 18 year old
- Prior ablation for SVT
- Presents with recurrent palpitation



Question 1

1. Reassure patient
2. Schedule ablation
3. Request more strips
4. Prescribe anxiolytic

Symptomatic Event	07/17/2014 20:13:59 CDT	
Preliminary Findings	HR 182 bpm	Activities: Resting
Sinus Tachycardia		Symptoms: Light Headed



Full Disclosure Strip Summary

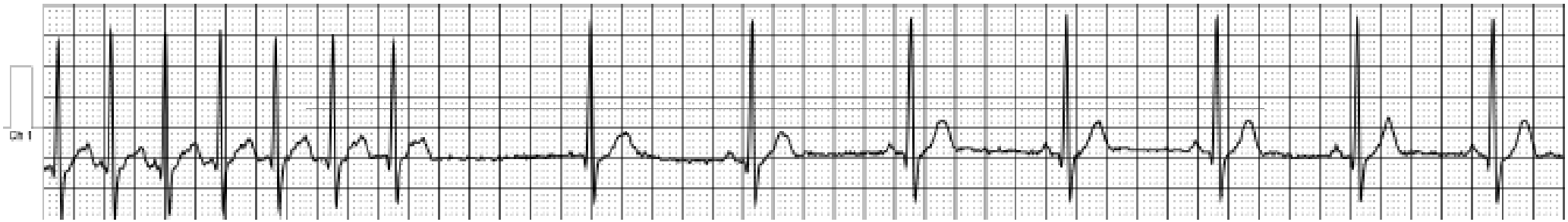
Date: 07/17/2014 20:13:48 CDT **HR:** 180 **Symptoms:** Light Headed

Findings: Requested Event - PSVT Offset into Sinus Arrhythmia

Full Disclosure Strip Summary

Date: 07/17/2014 20:13:48 CDT HR: 180 Symptoms: Light Headed

Findings: Requested Event - PSVT Offset into Sinus Arrhythmia



Diagnosis

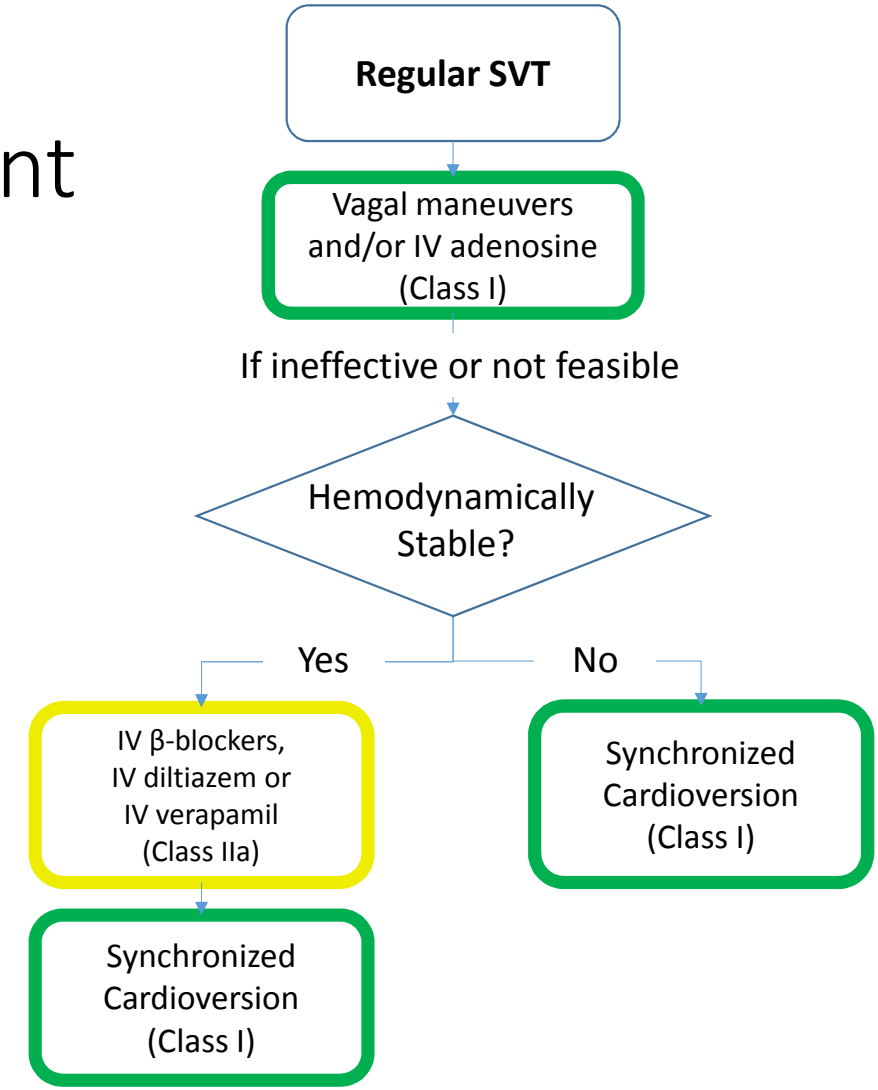
- History
  - Abrupt onset/offset
  - Triggers
  - Sensation in neck
- ECG
  - onset and/or offset – monitoring is VITAL
  - Look for the P waves
  - Look for the P waves
  - Look for the P waves
- Treatment
  - adenosine, carotid sinus massage may be required to make diagnosis

Agenda

- Definitions/Diagnosis
- Acute Treatment
- Long-Term Therapy

HEART RHYTHM SYMPOSIUM

Acute Treatment



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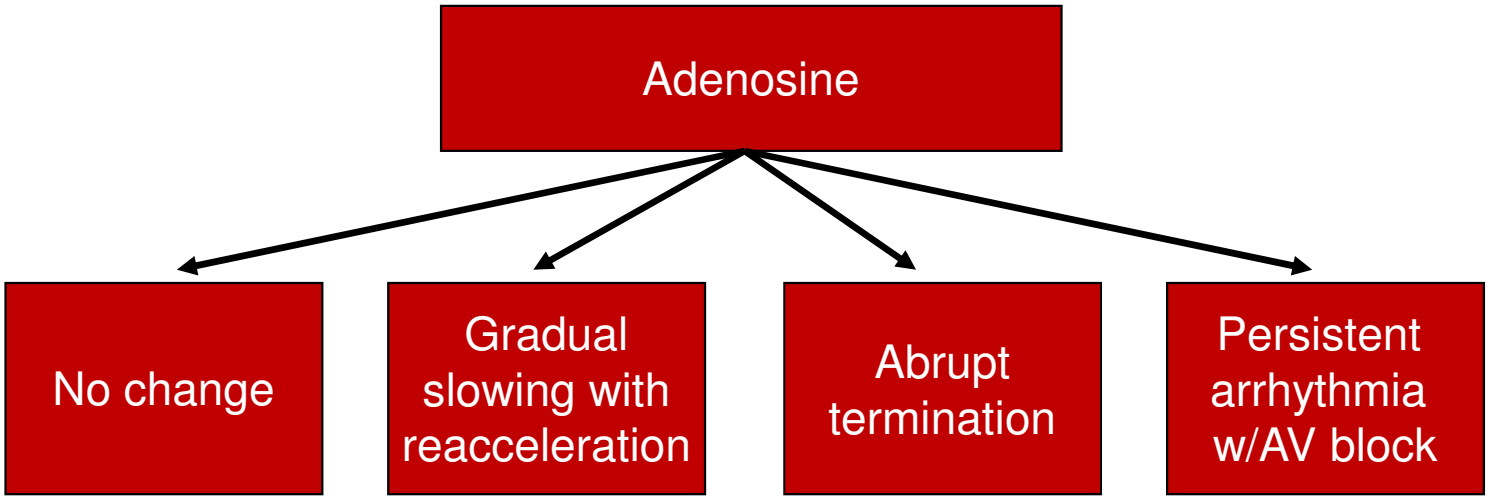


Inadequate dose/delivery
Consider VT

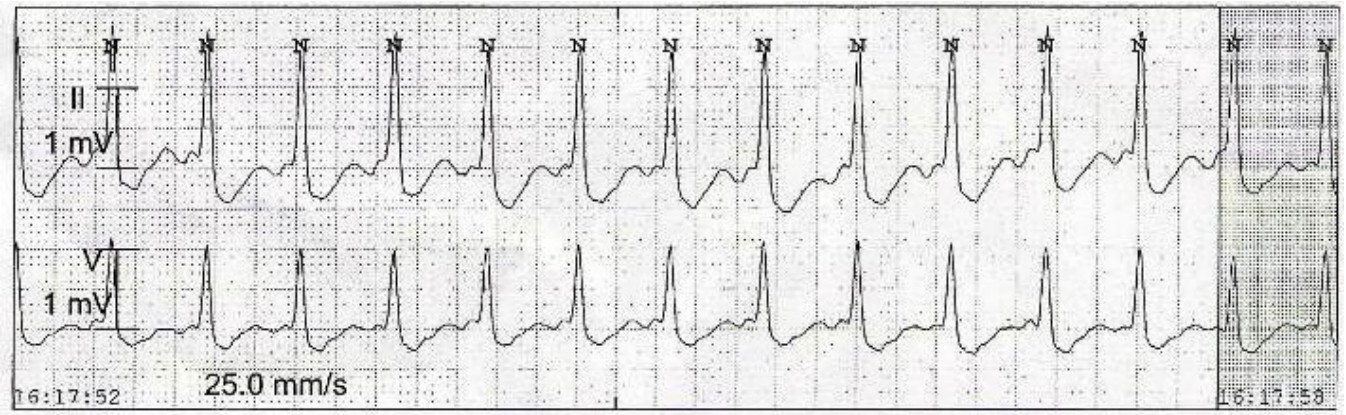
Sinus tachycardia
Focal AT

AVNRT
AVRT
Focal AT

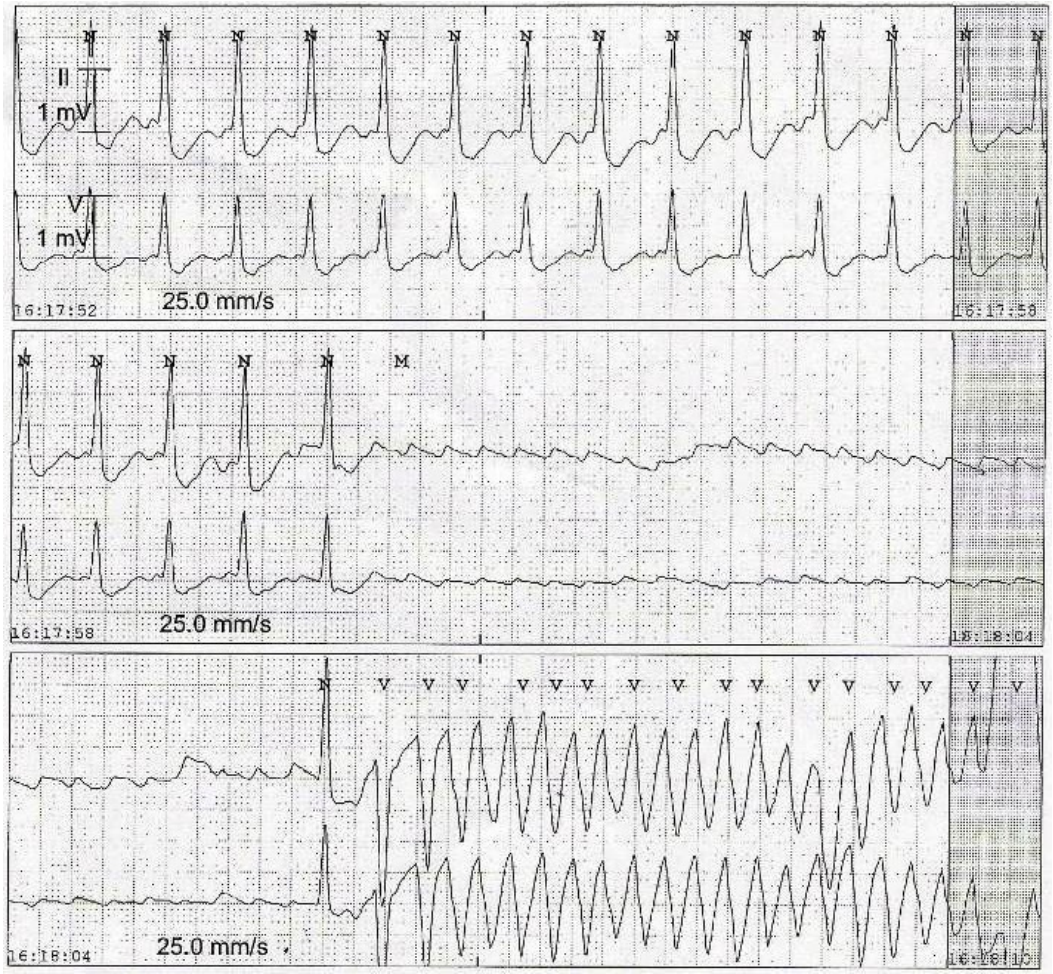
Atrial flutter
Reentrant AT

Adenosine Terminating SVT

Flutter or PSVT?



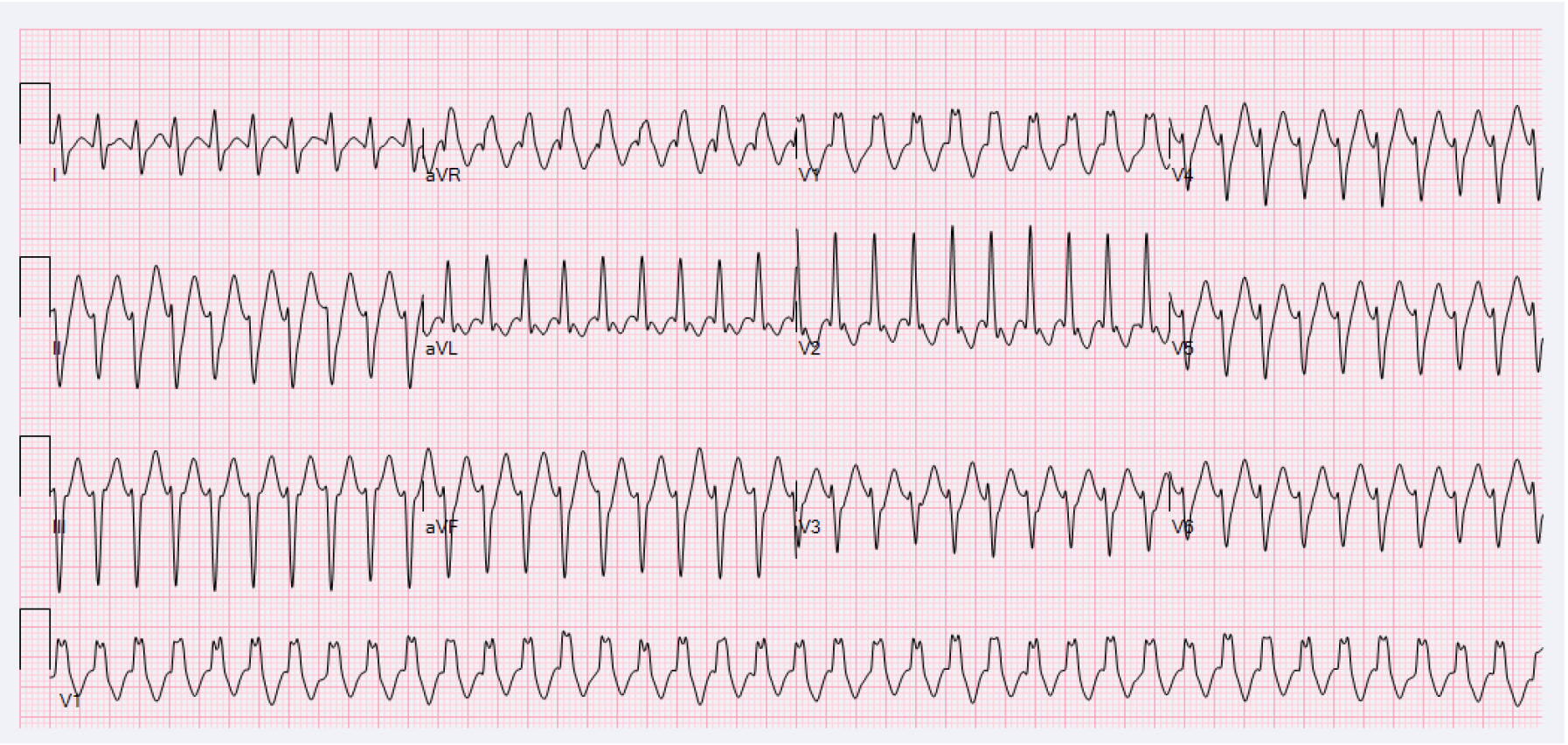
Sandler DA et al. *J Cardiovasc Electrophysiol* 2006;17:1251



Sandler DA et al. *J Cardiovasc Electrophysiol* 2006;17:1251

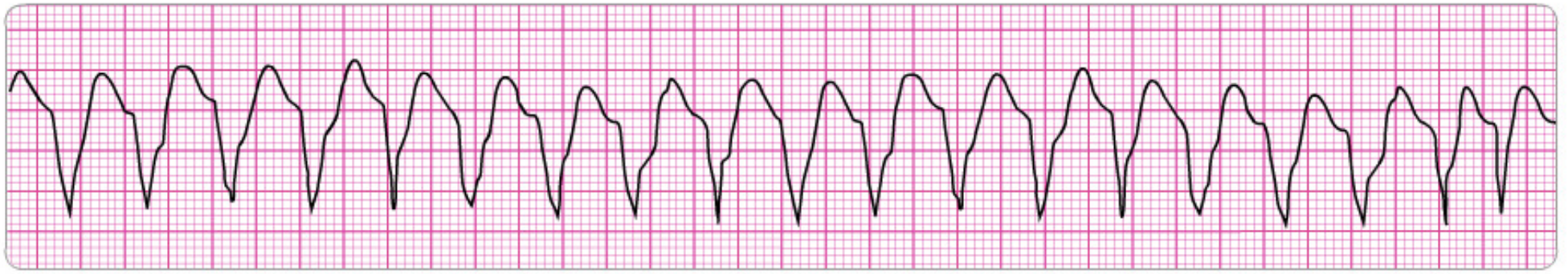
Question 2

35-year-old presents with palpitation



Question 2:
Why didn't this patient respond to adenosine?

1. Rhythm is not SVT
2. Adenosine not given fast enough
3. Not enough adenosine given



Question 19 of 20

You are monitoring a patient. He suddenly has the above persistent rhythm. You ask about symptoms, and he reports that he has mild palpitations, but otherwise he is clinically stable with unchanged vital signs. What is your next action?

- ○ Give an immediate unsynchronized shock.
- ○ Give an immediate synchronized shock.
- ◉ Administer adenosine 6 mg; seek expert consultation.
- ○ Administer magnesium sulfate 1 to 2 g IV diluted in 10 mL D5W given over 5 to 20 minutes.
- ○ Give sedation and perform synchronized cardioversion.

Correct

Next question

Agenda

- Definitions/Diagnosis
- Acute Treatment
- Long-Term Therapy

Long-Term Therapy

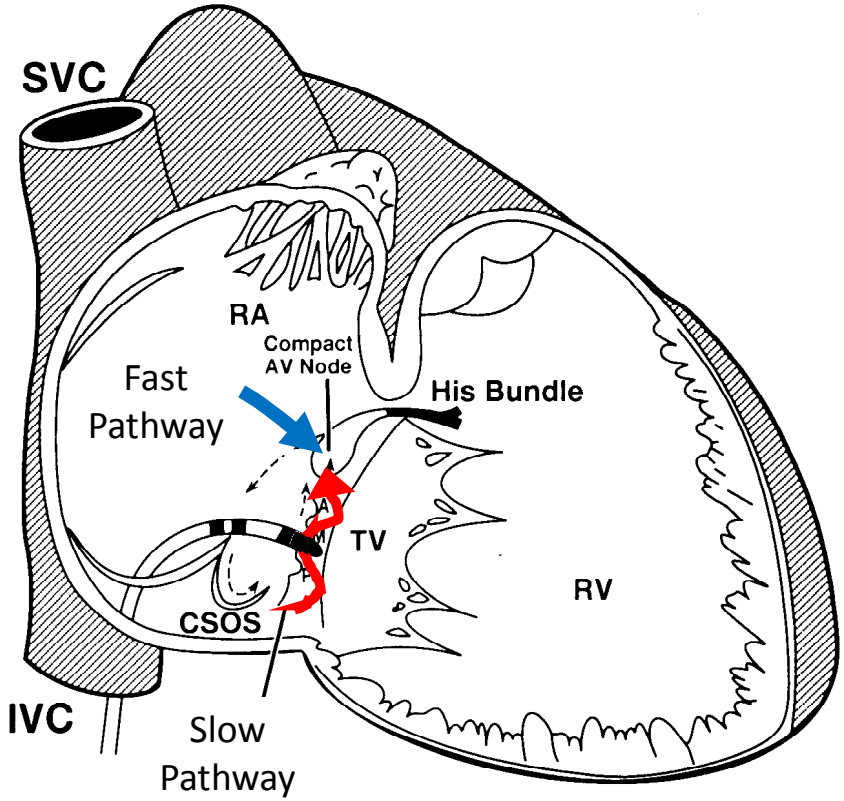
- What is ablation?
- What is prognosis?

AVNRT Ablation

Success 96-97%
Recurrence 5%

Complications

- AV block 0.7%
- Death 0%
- Tamponade 0%



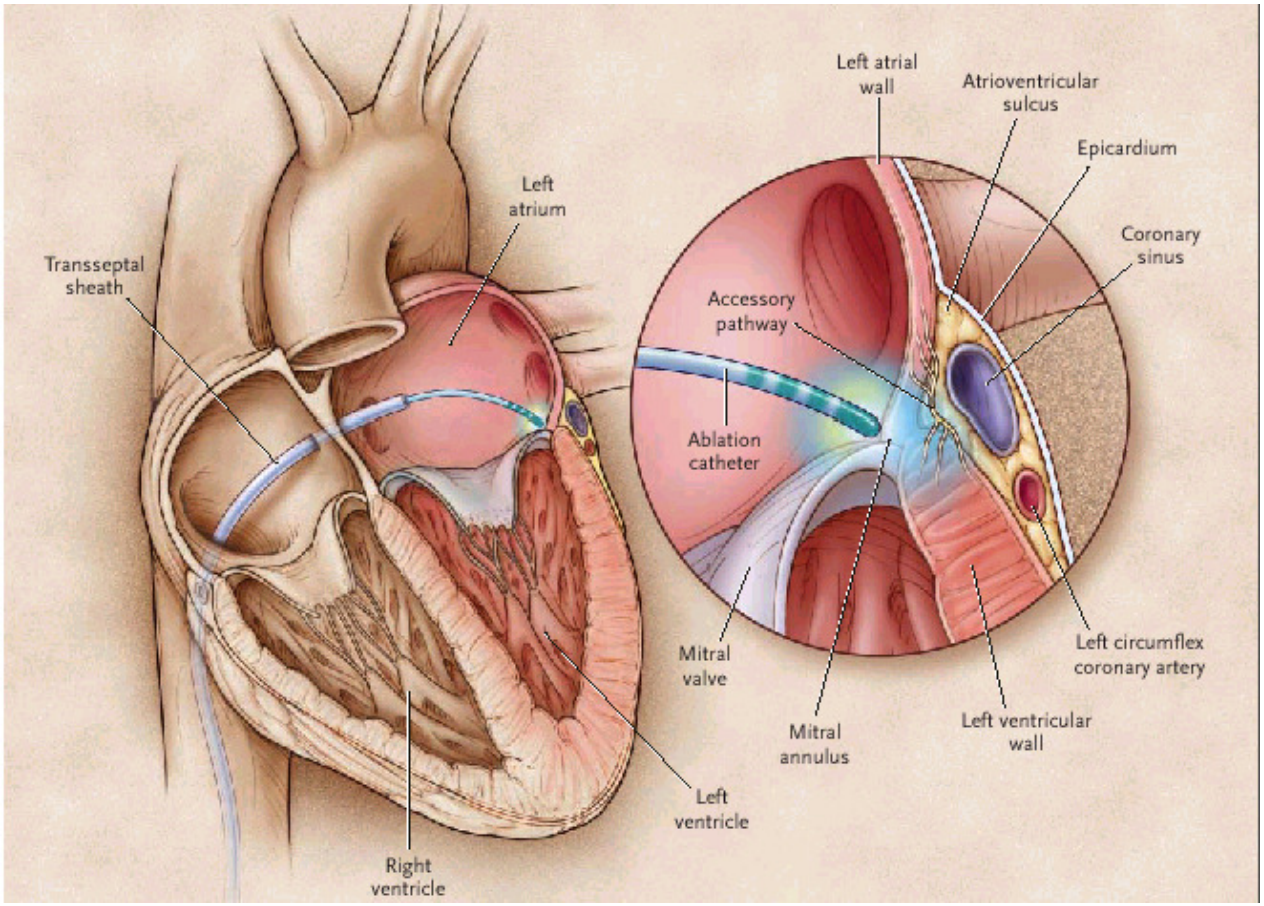
Spector P et al *Am J Cardiol*. 2009;104:671–7.
Calkins H et al *Circulation.* 1999;99:262–70.

AVRT Ablation

Success 93%
Recurrence 8 %

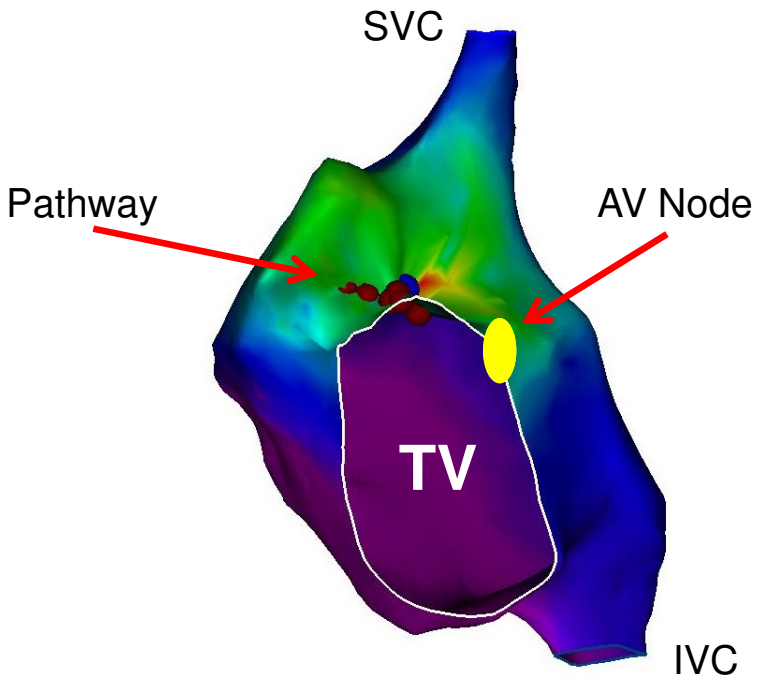
Complications

AV Block 0.3%
Death 0.1%
Tamponade 0.4%



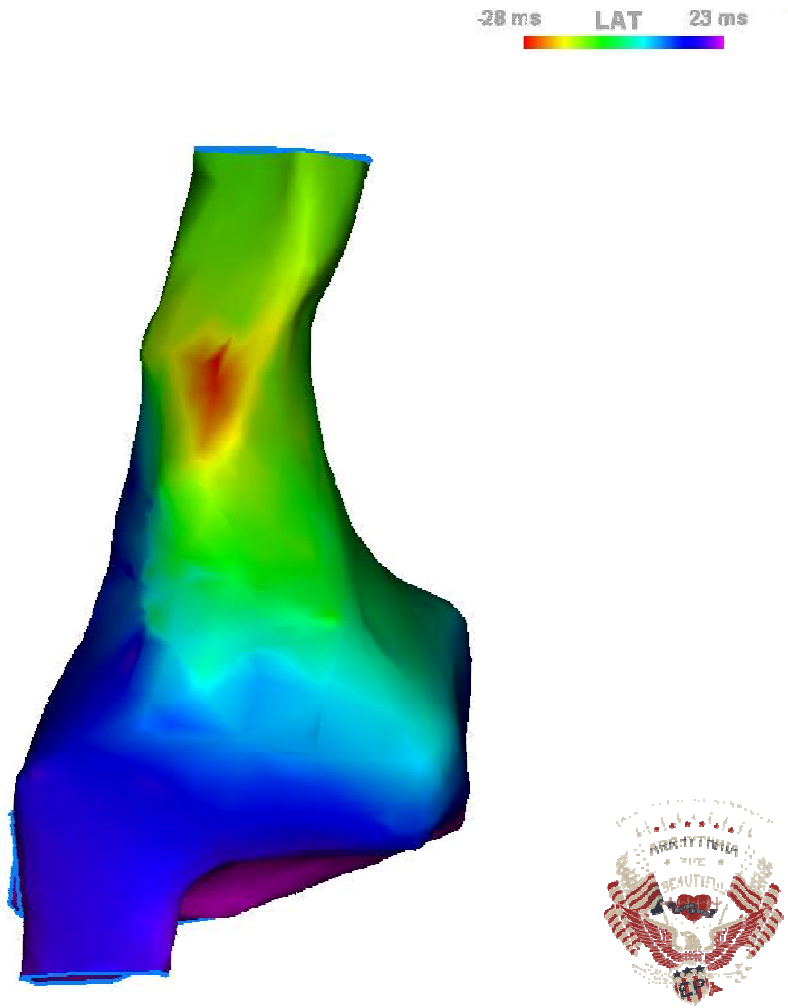
Spector P et al *Am J Cardiol*. 2009;104:671–7.
Calkins H et al *Circulation.* 1999;99:262–70.

Young patient with recurrence after prior ablation



Atrial Tachycardia Ablation

- Requires induction and mapping
  - May be difficult with sedation
- Success rates often lower (“80-100%”)
- Complications based on location
  - Less than 2%



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Right atrial focus (70%)

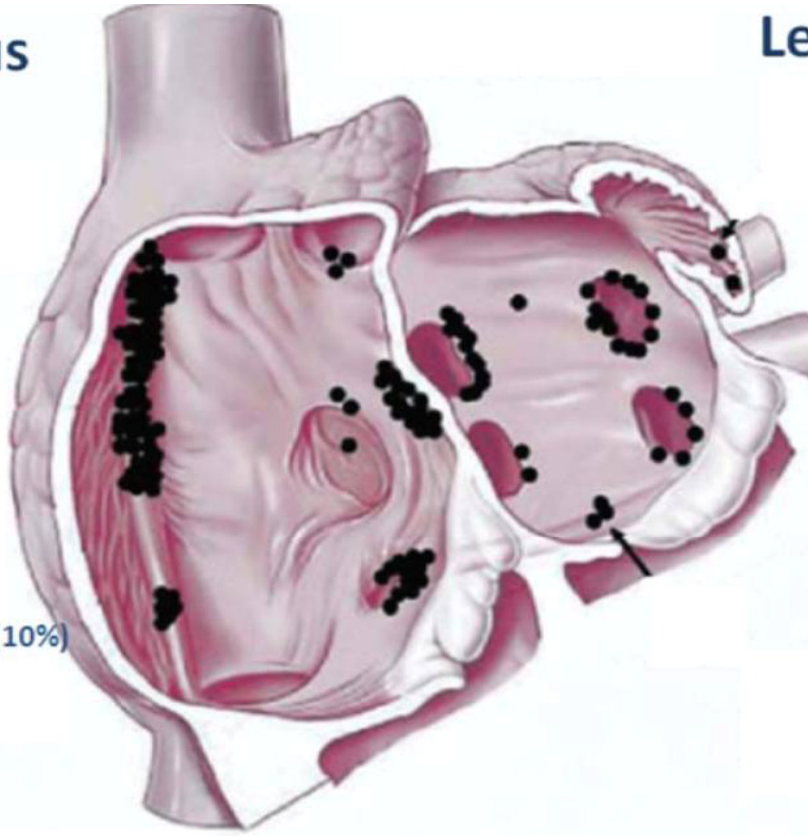
Crista terminalis (30%)

Perinodal tissue

Right septum

Coronary sinus ostium (10%)

Tricuspid annulus(20%)



Left atrial focus (30%)

Pulmonary vein(20%)

Left septum

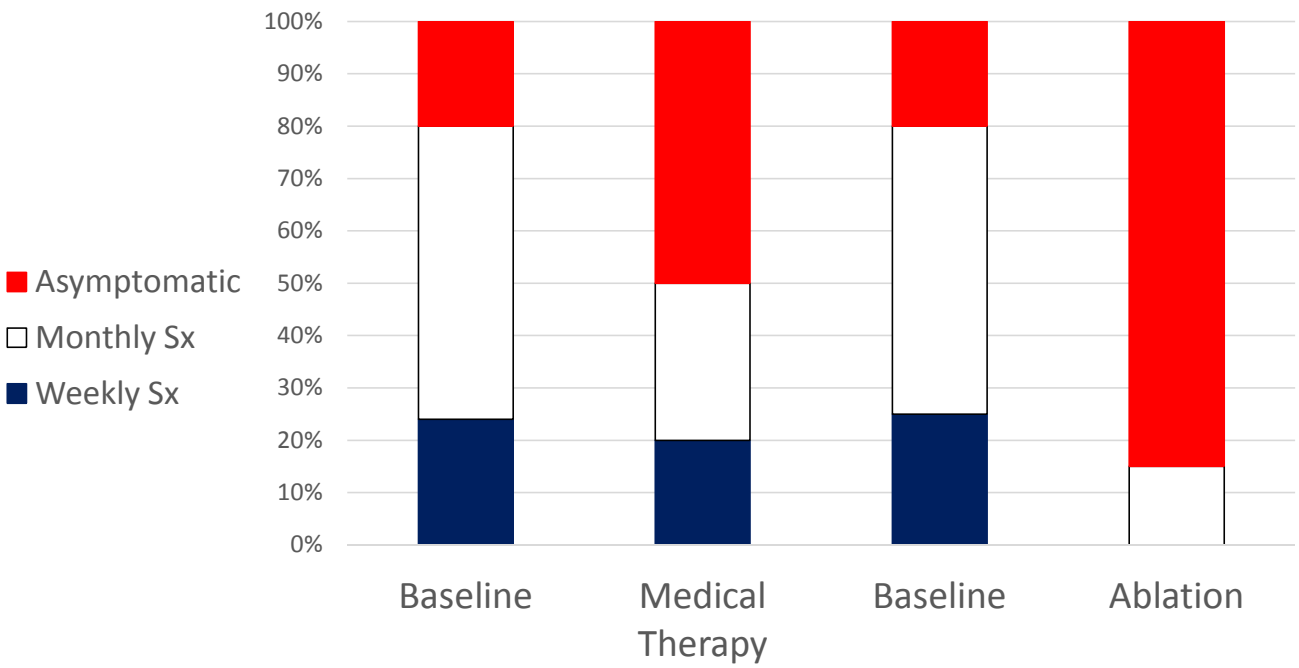
CS body

Mitral annulus

Note : RA free wall , LA free wall ,LA appendage are less common focus

Kister PM J Am Coll Cardiol 2006;48:1010

SVT Quality of Life

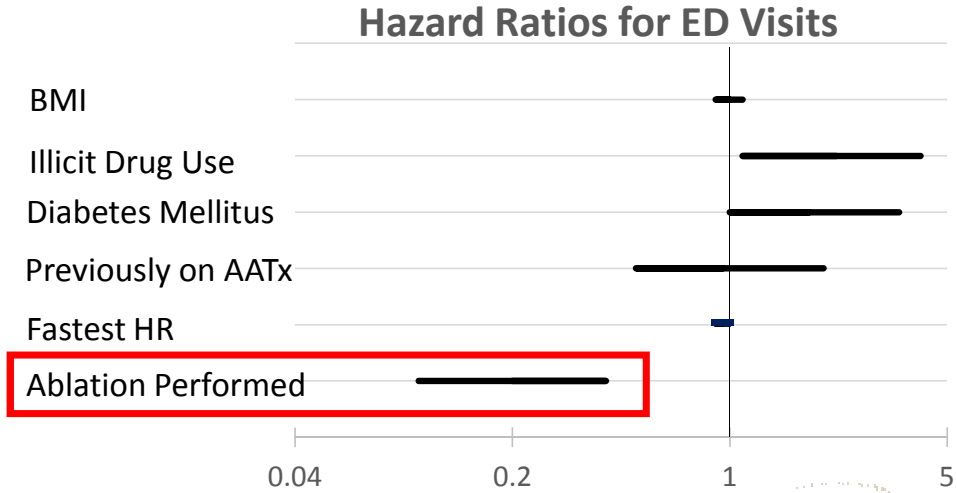


Ablation improves health-related quality of life to a greater extent, and in more aspects of general and disease-specific health than medication

Bathina MN et al. *Am J Cardiol*. 1998 Sep 1;82(5):589-93

Health Care Utilization of Patients Presenting to the ED with PSVT

- Retrospective analysis of 100 patients presenting to an urban ED for treatment of first PSVT between February 2006 and August 2011
- A visit to an electrophysiologist and ablation for SVT, are associated with markedly reduced health care utilization among patients presenting to the ED with PSVT



Oesterle AC et al *Circulation*. 2013;128:A11167

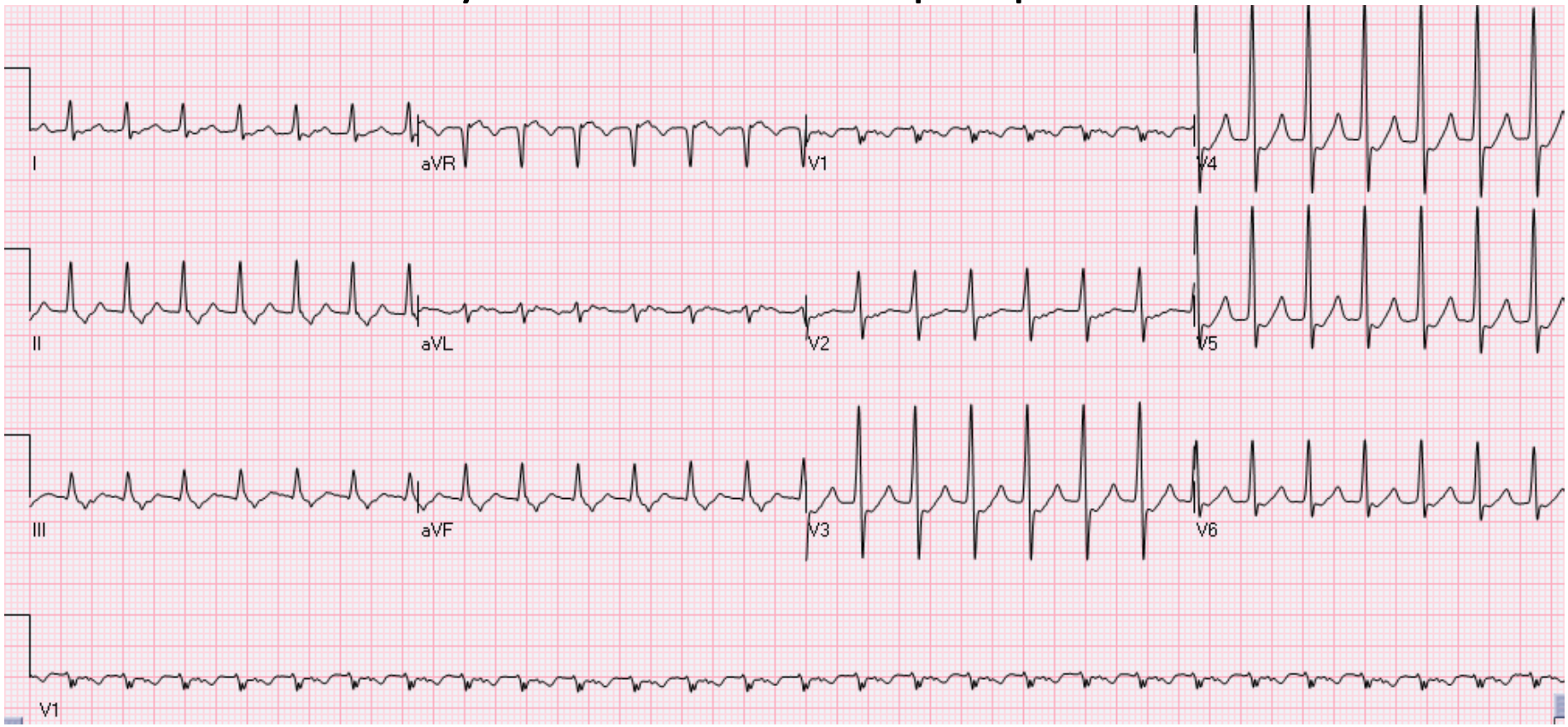
SVT Prognosis

- "Benign" (extremely rare to cause death)*
- Often recurs

*Except WPW

Question 3

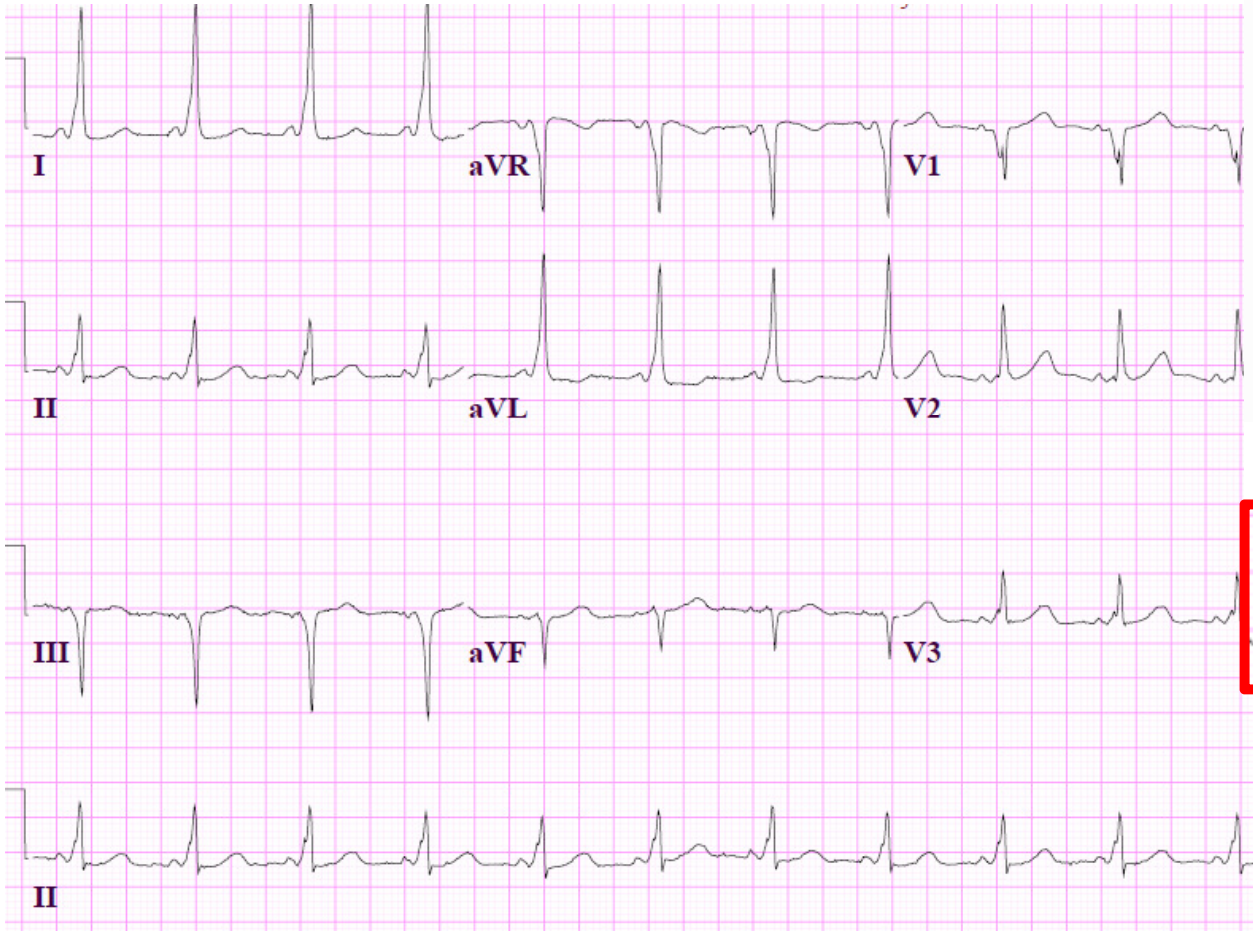
28-year-old with palpitation

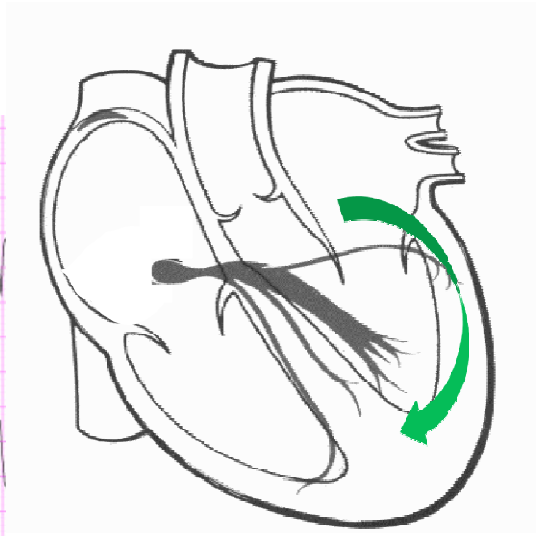


Question 3
Does this patient have WPW?

1. Yes
2. No
3. Can't tell

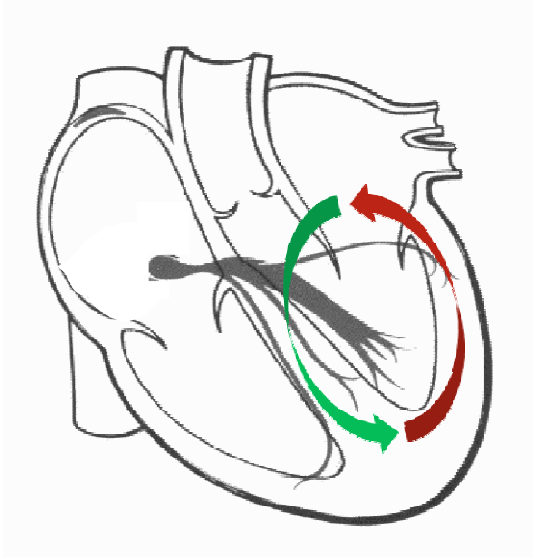
Wolff-Parkinson-White Syndrome



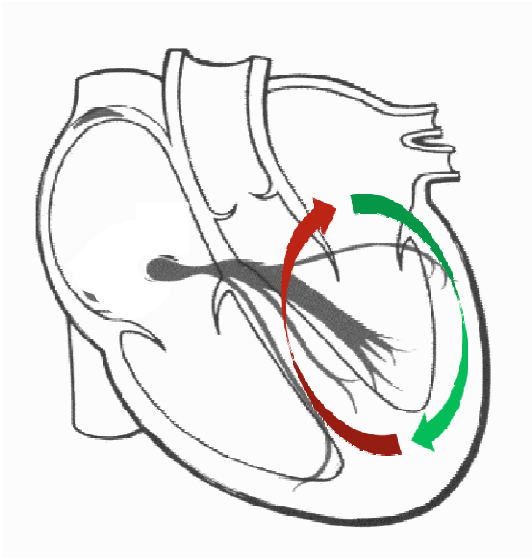


Delta Wave

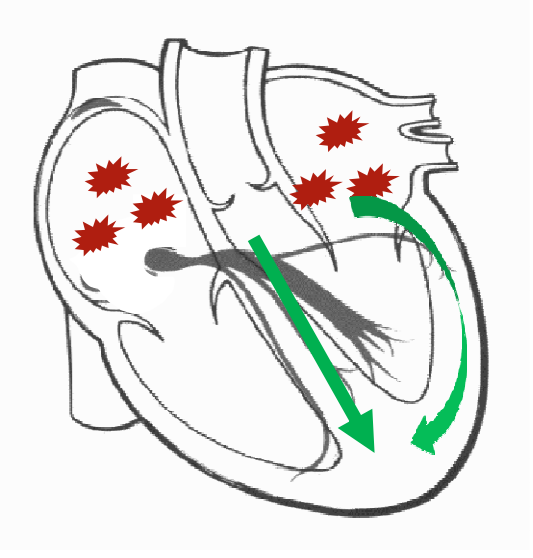
WPW Arrhythmia Mechanisms



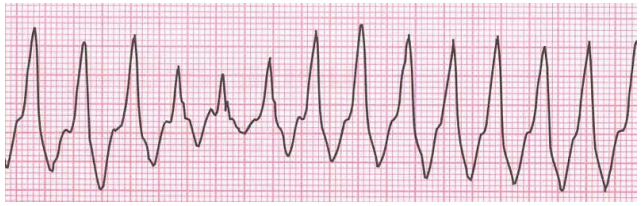
Orthodromic



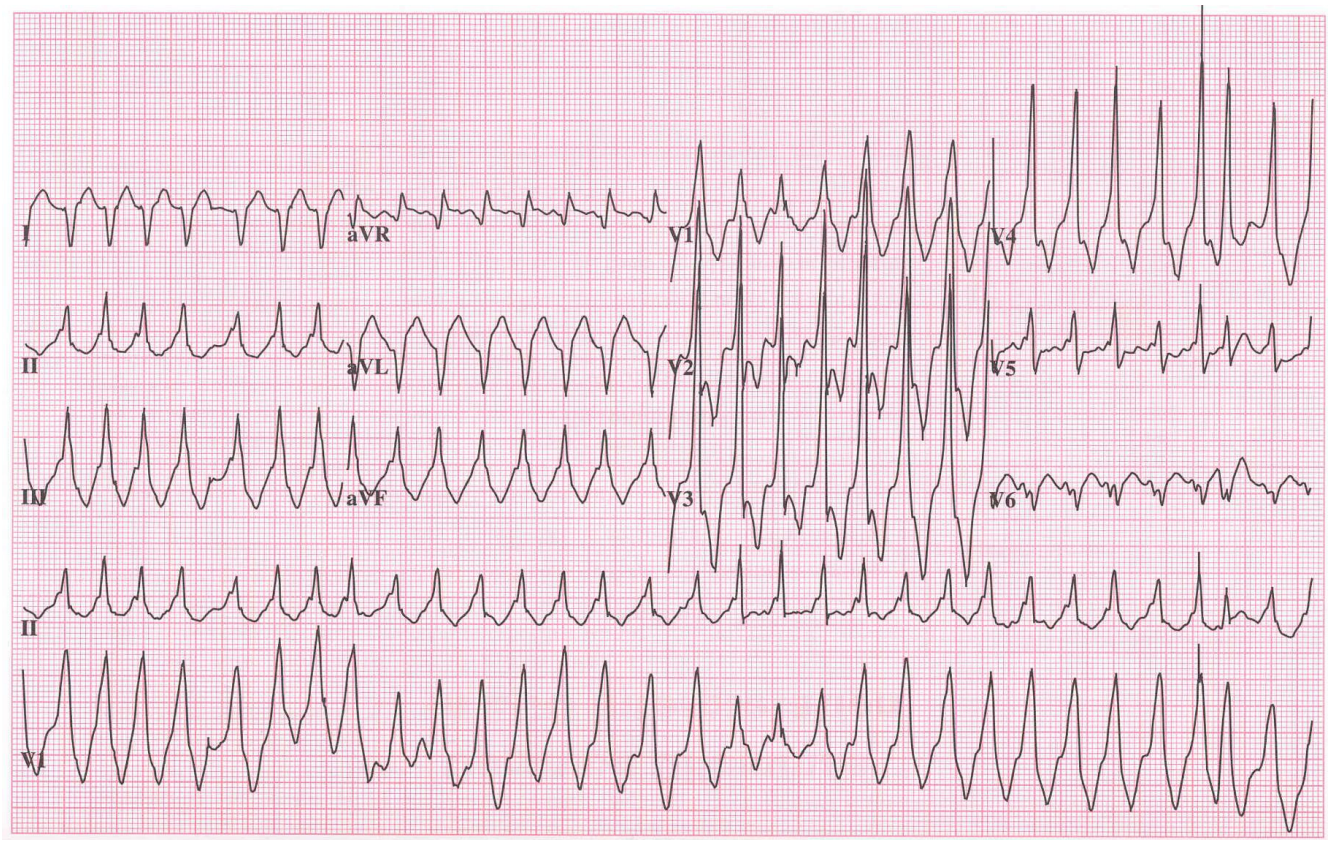
Antidromic



Atrial Fibrillation



Atrial Fibrillation with Accessory Pathway: Life threatening



Usefulness of Invasive Electrophysiologic Testing to Stratify the Risk of Arrhythmic Events in Asymptomatic Patients With Wolff-Parkinson-White Pattern

Results From a Large Prospective Long-Term Follow-Up Study

Carlo Pappone, MD, PHD, Vincenzo Santinelli, MD, Salvatore Rosanio, MD, PHD, Gabriele Vicedomini, MD, Stefano Nardi, MD, Alessia Pappone, MD, Valter Tortoriello, MD, Francesco Manguso, MD, PHD, Patrizio Mazzone, MD, Simone Gulletta, MD, Giuseppe Oreto, MD, Ottavio Alfieri, MD

Of the eight patients with symptomatic episodes of AF and inducible sustained AF, two had a resuscitated cardiac arrest and one died suddenly; all three patients were inducible for AVRT and AF and had multiple APs.

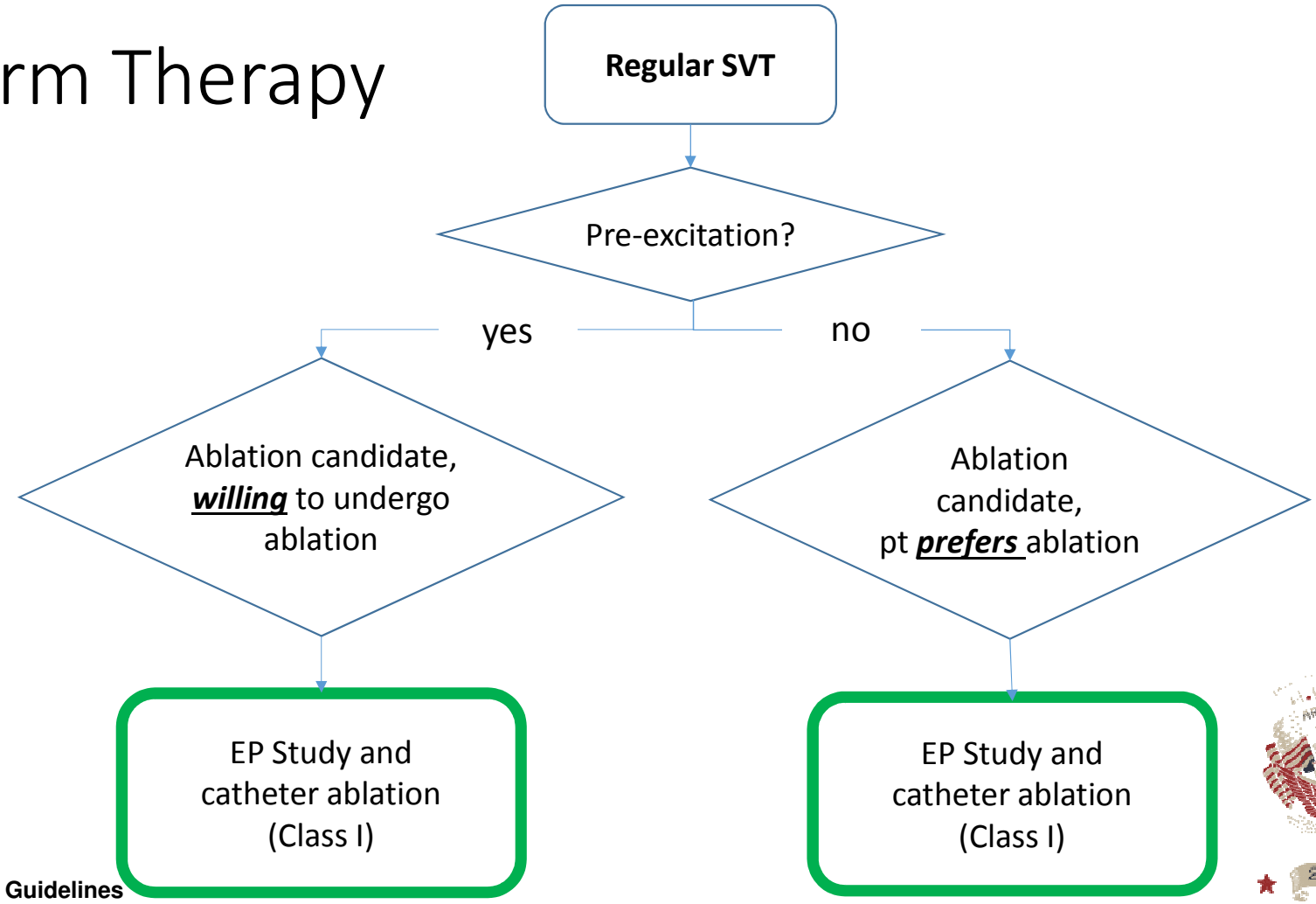
asymptomatic patients. Serial EPTs have been proposed to identify patients at risk.

METHODS A total of 212 consecutive asymptomatic WPW patients were enrolled after a baseline EPT; patients were followed for five years, and 162 patients (115 noninducible and 47 inducible) patients underwent a second EPT.

RESULTS After a mean follow-up of 37.7 months, 33 patients became symptomatic. Of the 115 noninducible patients, 18.2% lost anterograde accessory pathway (AP) conduction, 30% retrograde AP conduction, and only 4 (3.4%) developed symptomatic supraventricular tachycardia (SVT). Of the 47 inducible patients, 25 with sustained atrioventricular reciprocating tachycardia (AVRT) and atrial fibrillation (AF), and 4 with nonsustained AVRT and AF became symptomatic for SVT (n = 21) and AF (n = 8). They were younger, had shorter AP anterograde refractory periods, and multiple APs compared to patients who remained asymptomatic (for all comparisons, $p < 0.0001$). Of the eight patients with symptomatic episodes of AF and inducible sustained AF, two had a resuscitated cardiac arrest and one died suddenly; all three patients were inducible for AVRT and AF and had multiple APs.

CONCLUSIONS In asymptomatic WPW subjects, EPT may be a valuable tool to stratify the risk of symptomatic and fatal arrhythmic events. (J Am Coll Cardiol 2003;41:239–44) © 2003 by the American College of Cardiology Foundation

Long-Term Therapy



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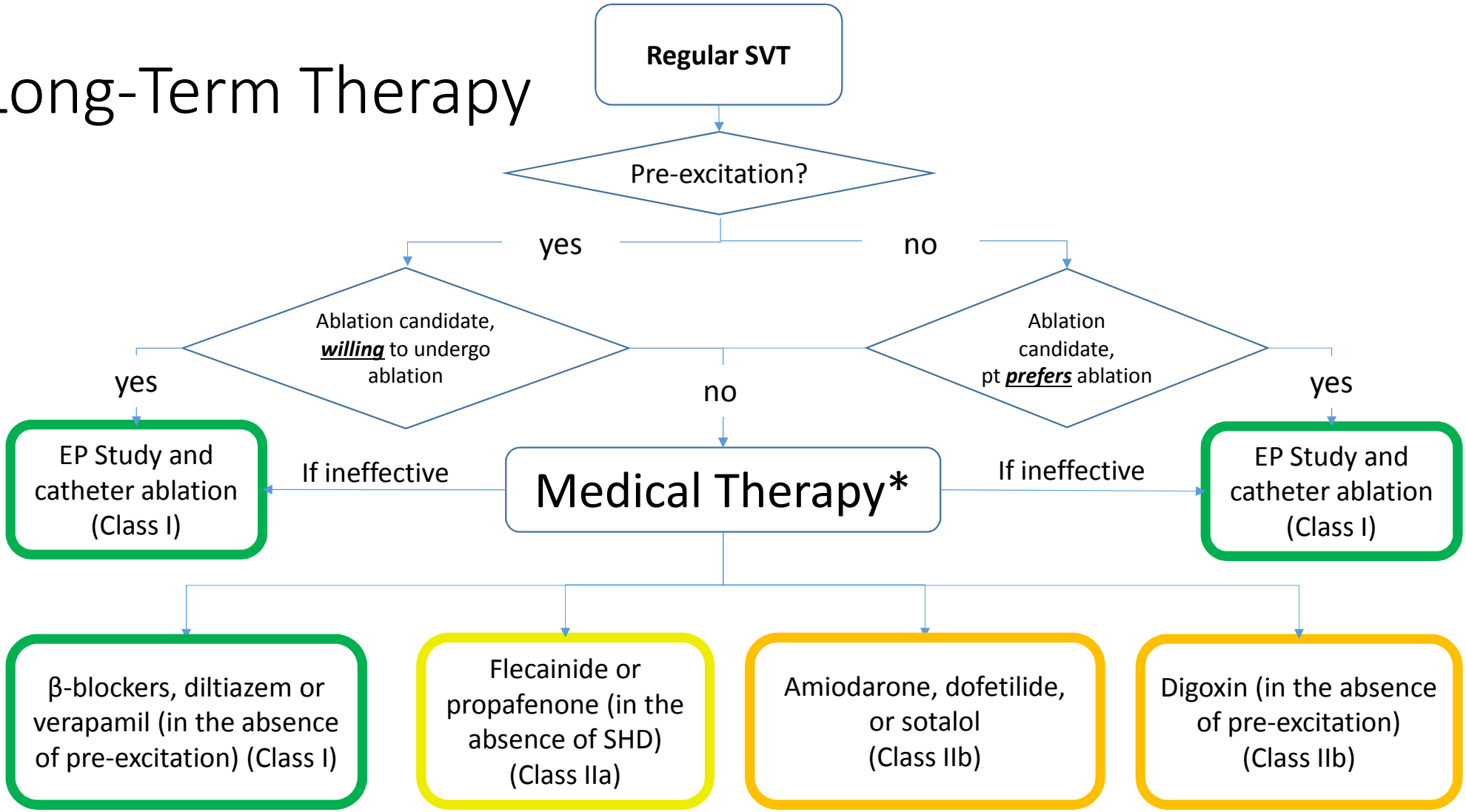
Long-Term Therapy



Parting Thoughts

- Symptoms of palpitation should be evaluated with a monitor
- Symptoms suspicious of pSVT include abrupt onset and offset, sensation in the neck
- True pSVT refers to: AVNRT, AVRT, atrial tachycardia
- pSVT ablation comes with high success and low complication rates
- Decision to ablate based on severity/frequency of symptoms
- WPW may be a life-threatening condition and needs further evaluation

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