
THE APPROACH TO THE PATIENT WITH VENTRICULAR DYSRHYTHMIA

W. Jeremy Mahlow, MD, FACC

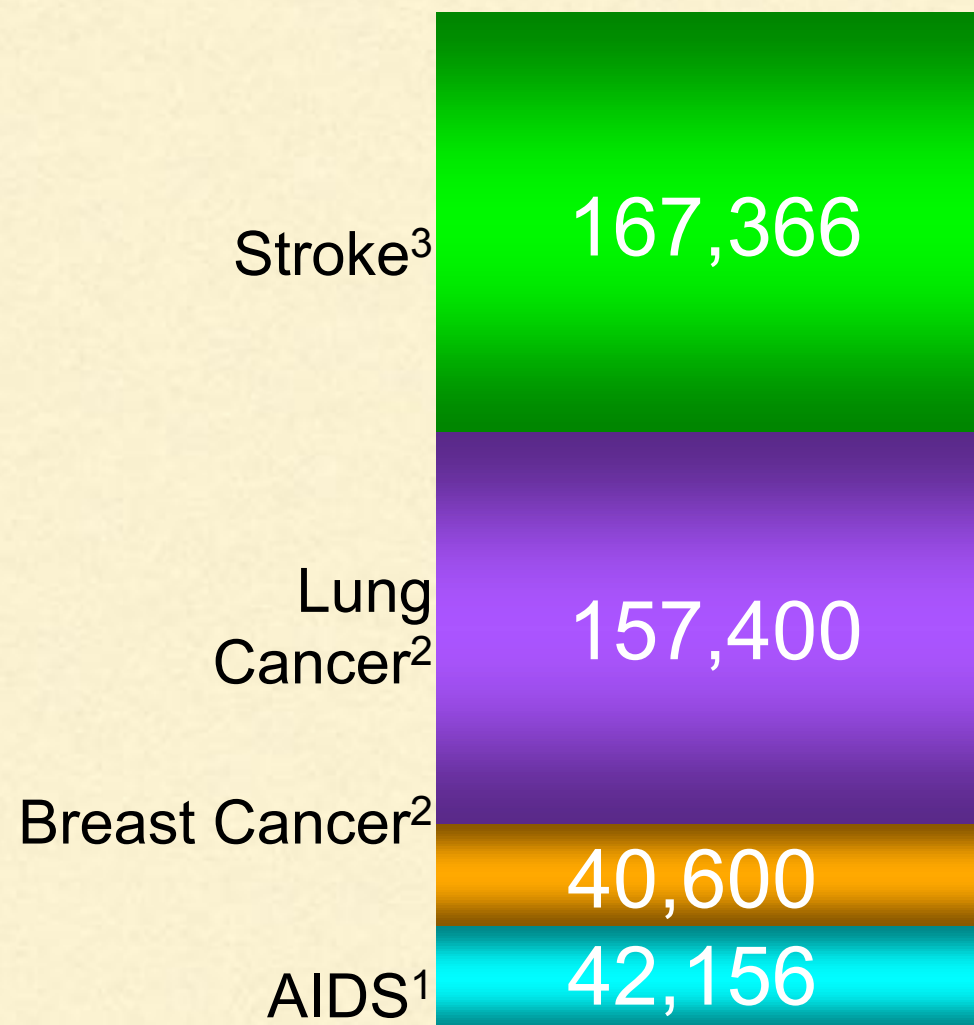
Cardiac Electrophysiologist, UT Medical Center at Knoxville

HOW YOU ARE GOING TO DIE

W. Jeremy Mahlow, MD, FACC

Cardiac Electrophysiologist, UT Medical Center at Knoxville

EPIDEMIIOLOGY



SCA claims
more lives
each year than
these other
diseases
combined

450,000

SCA⁴

#1 Killer in
the U.S.

¹ U.S. Census Bureau, *Statistical Abstract of the United States: 2001*.

² American Cancer Society, Inc., *Surveillance Research, Cancer Facts and Figures 2001*.

³ *2002 Heart and Stroke Statistical Update*, American Heart Association.

⁴ *Circulation*. 2001;104:2158-2163.

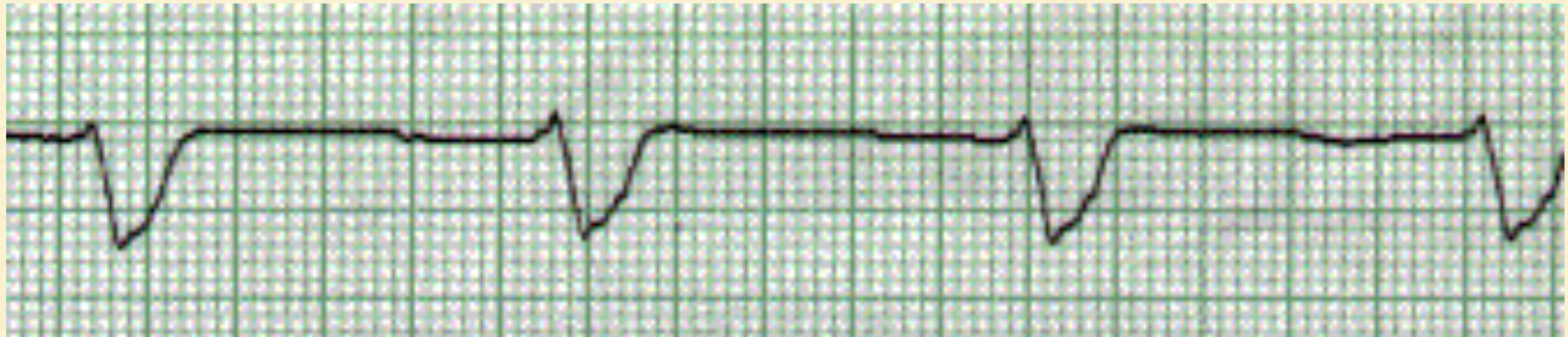
NOMENCLATURE

- Premature Ventricular Contraction
 - Complex Ectopy
 - Non-sustained Ventricular Tachycardia: ≥ 3 beats
 - Sustained Ventricular Tachycardia
 - 30 seconds or unstable
 - Monomorphic, Polymorphic
-

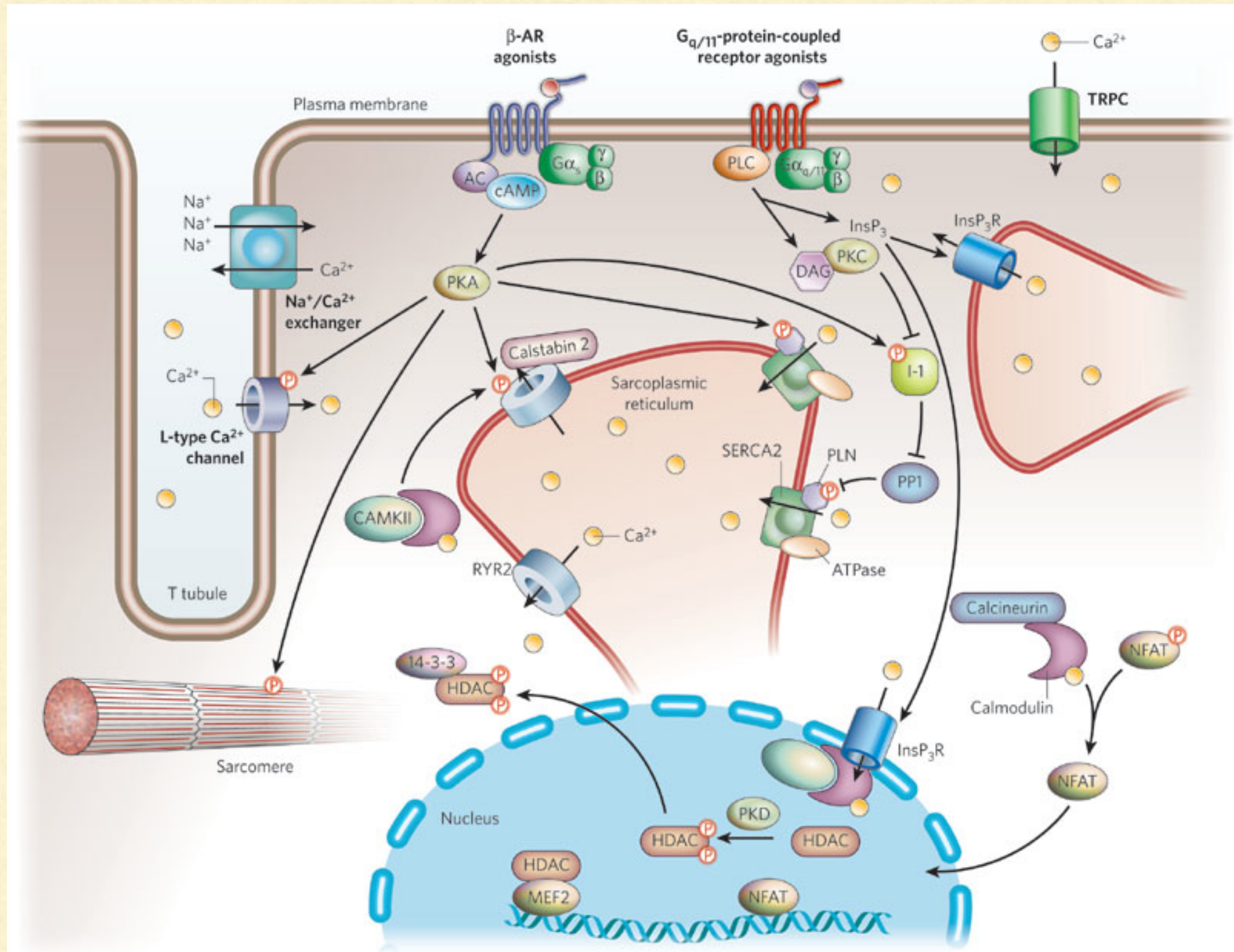
PATHOPHYSIOLOGY

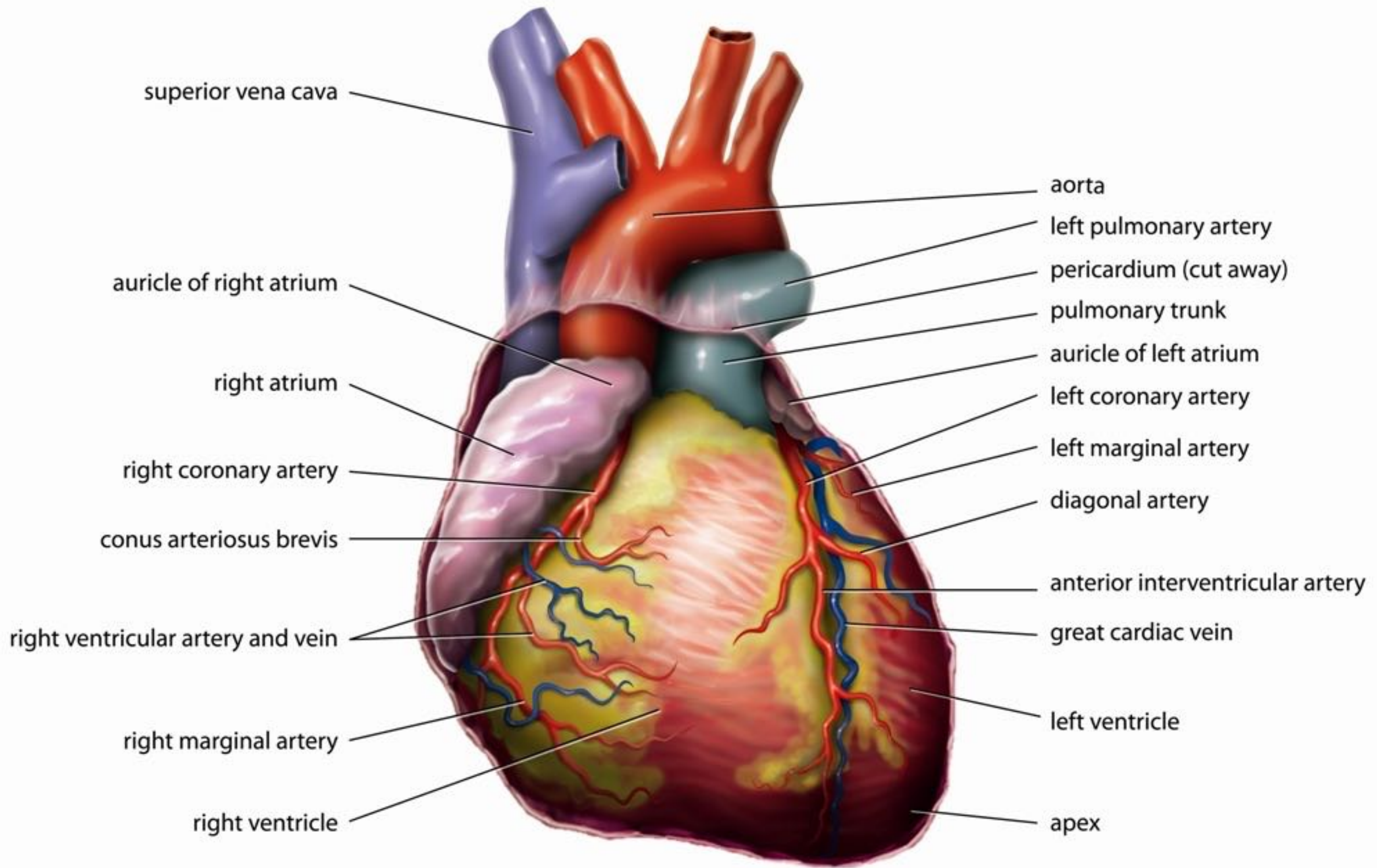
MECHANISMS OF ARRHYTHMIA

- ABNORMAL AUTOMATICITY
 - TRIGGERED ACTIVITY
 - REENTRY
-



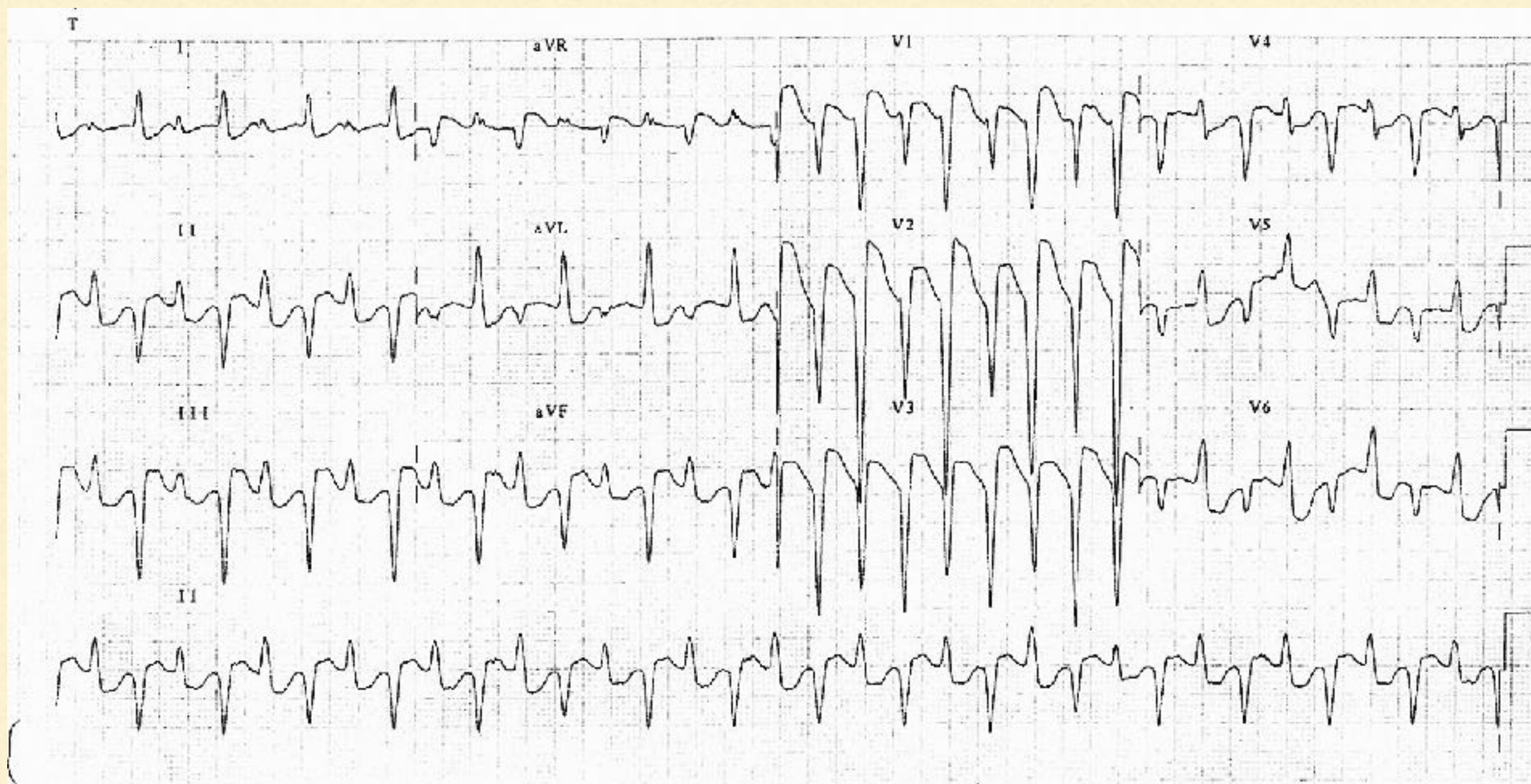




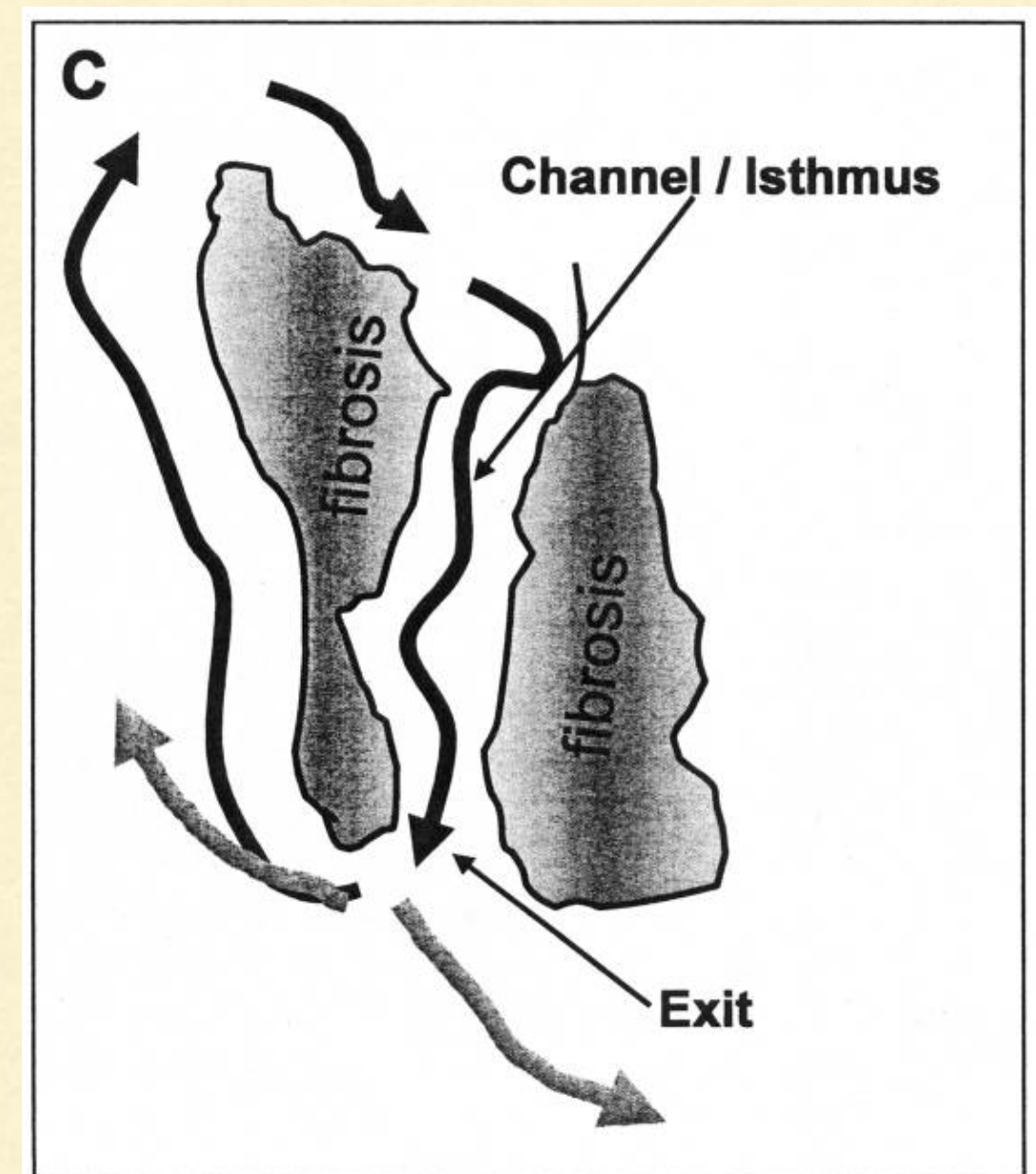
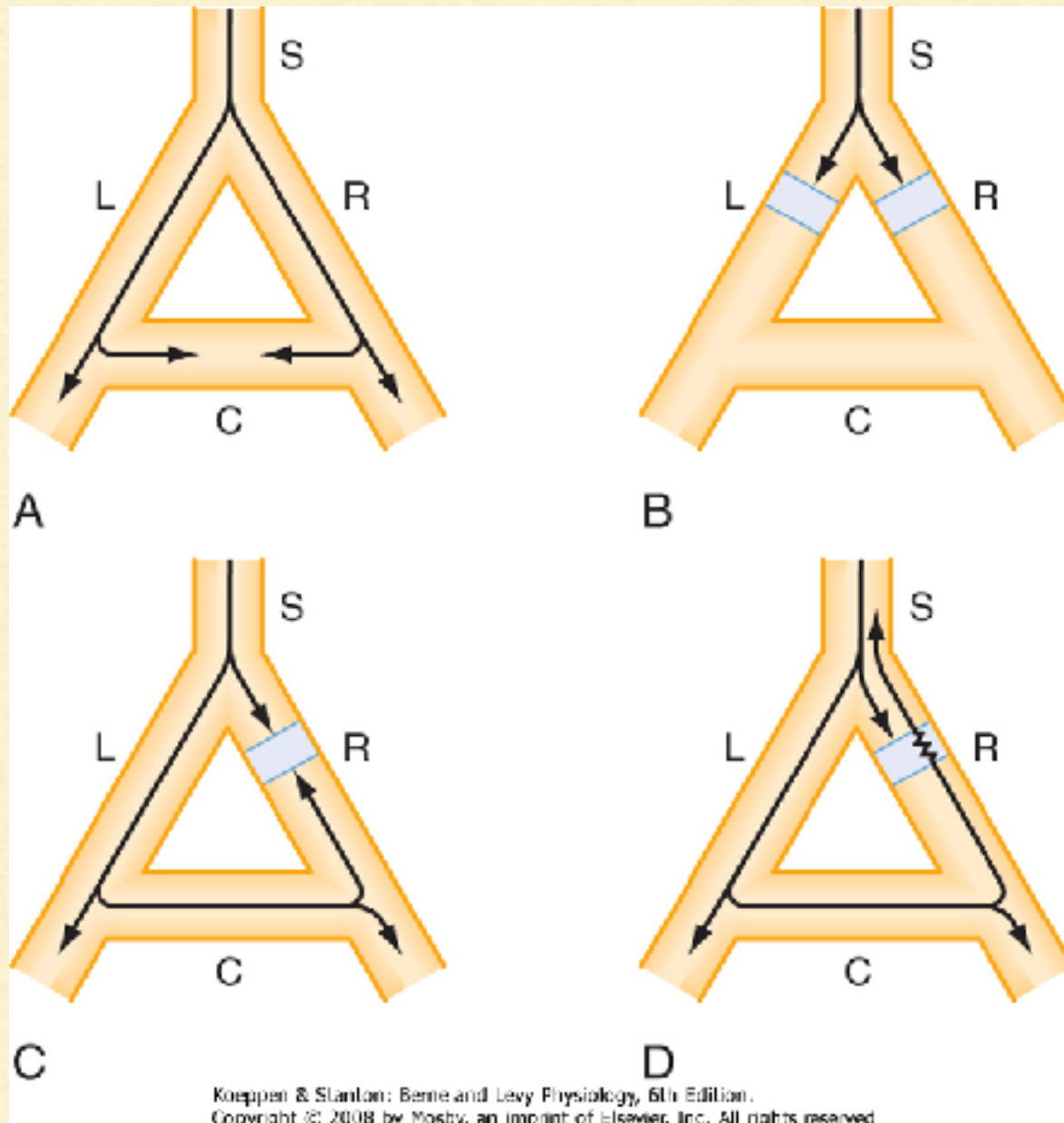


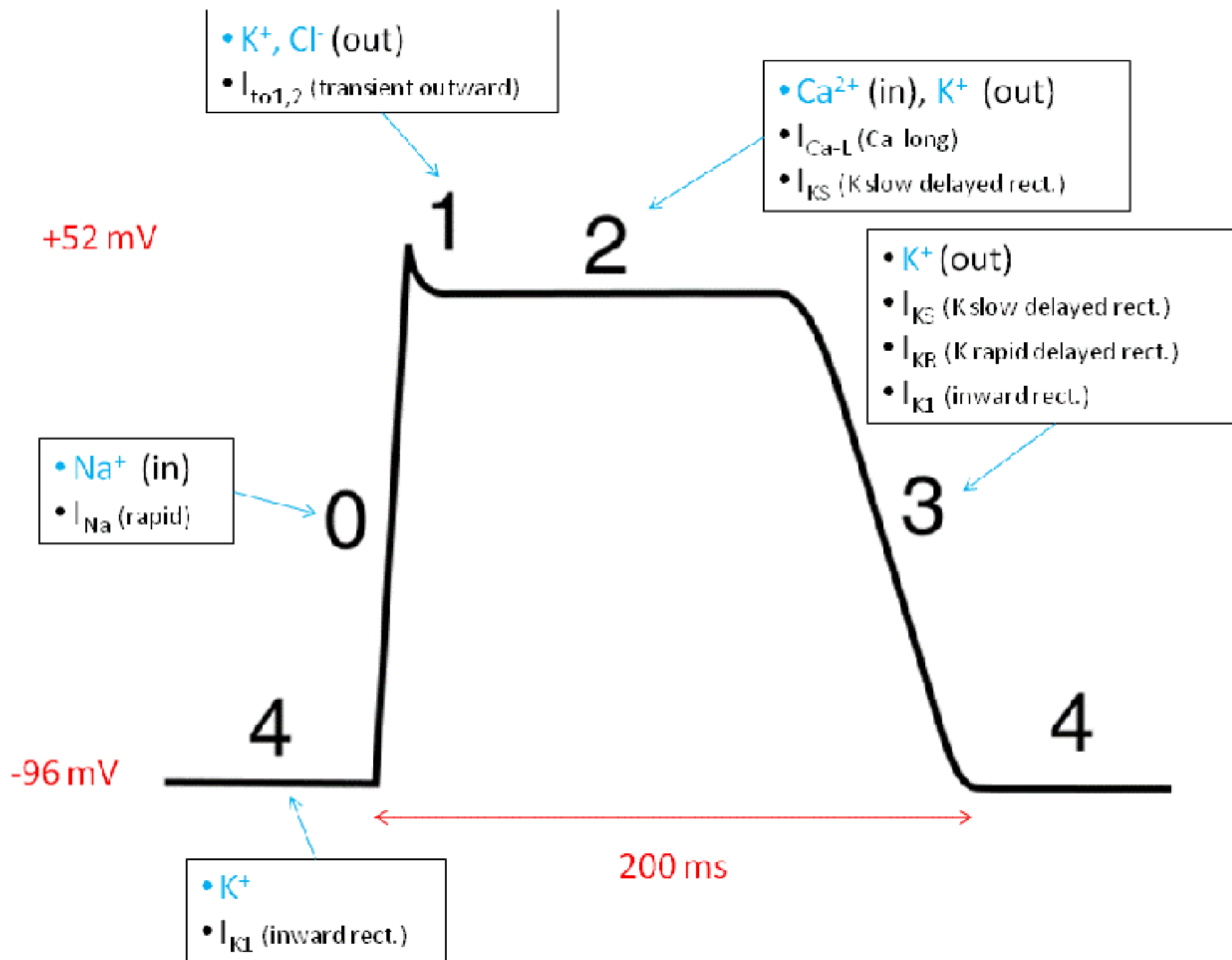
ARE PVC'S INNOCENT?

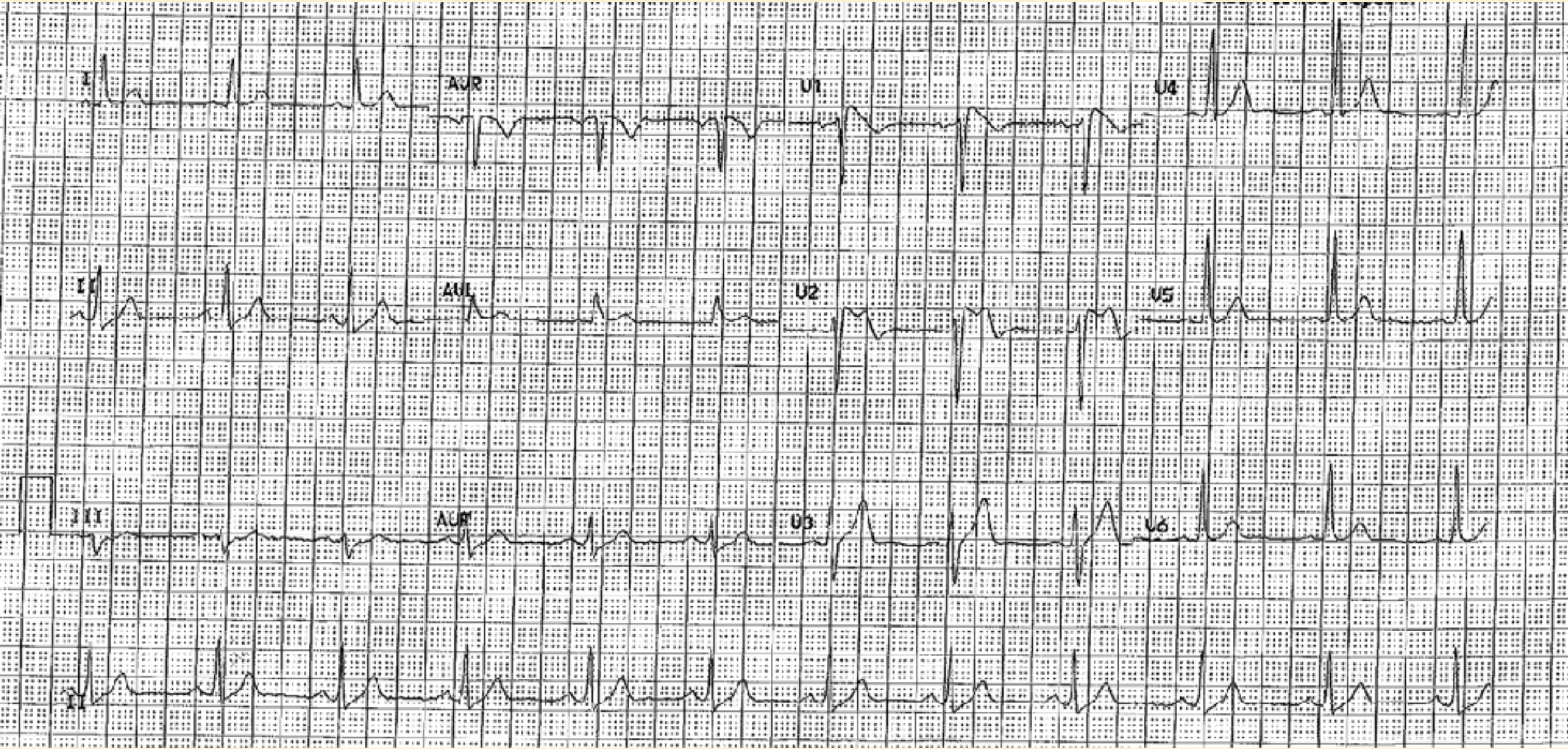
- Consider the underlying etiology: sepsis, shock, ischemia, electrolytes
 - Complex ectopy is associated with sudden cardiac death
 - $\geq 10,000$ PVC's per day is associated with cardiomyopathy
 - Catecholaminergic Polymorphic VT, ARVC, other cardiomyopathies
-

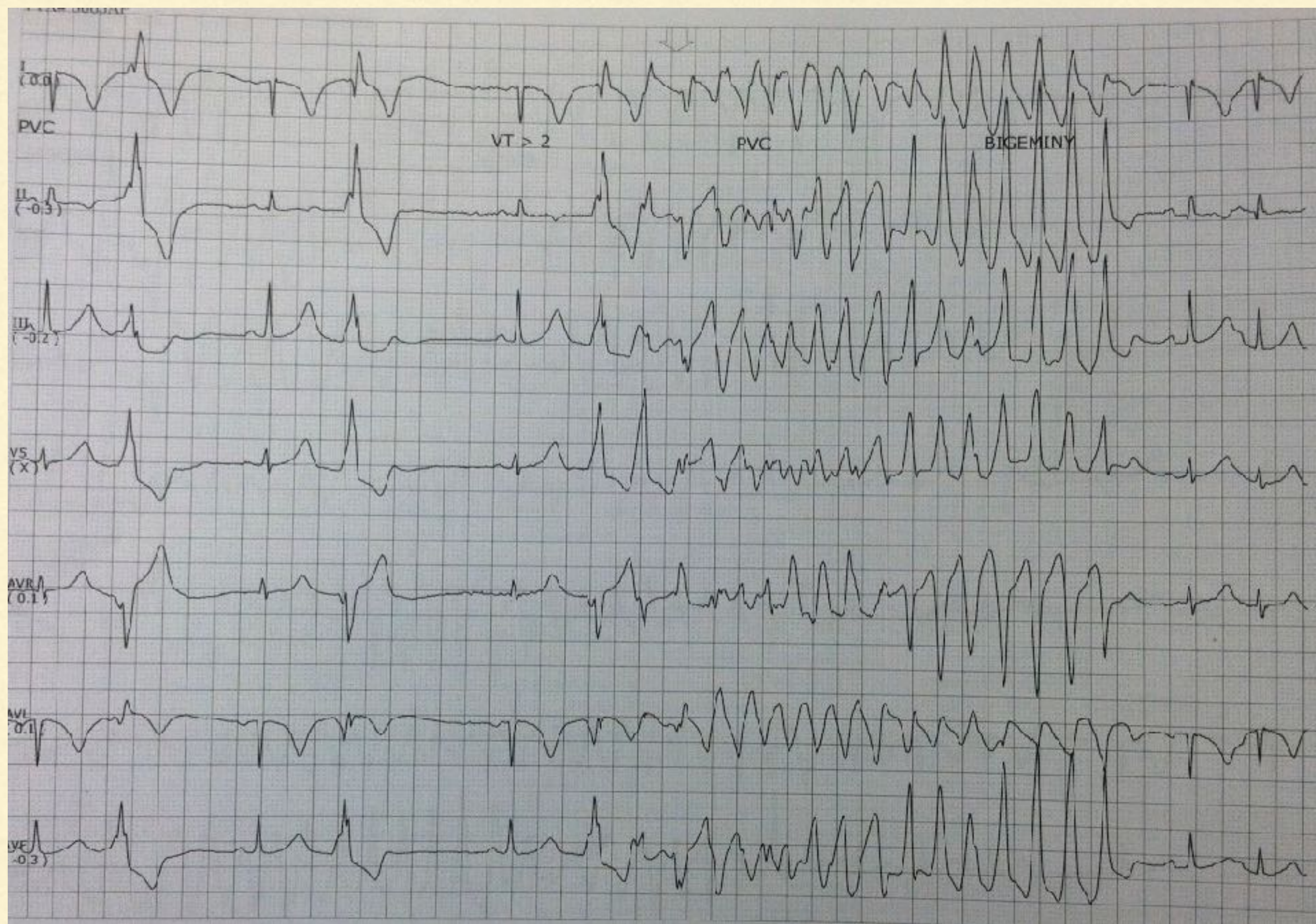


REENTRY









TORSADES DE POINTES- MANAGEMENT

- Magnesium, Potassium
 - Increase heart rate
 - Beta agonist
 - Pacing
 - Stop the offending agent
-

DIAGNOSIS

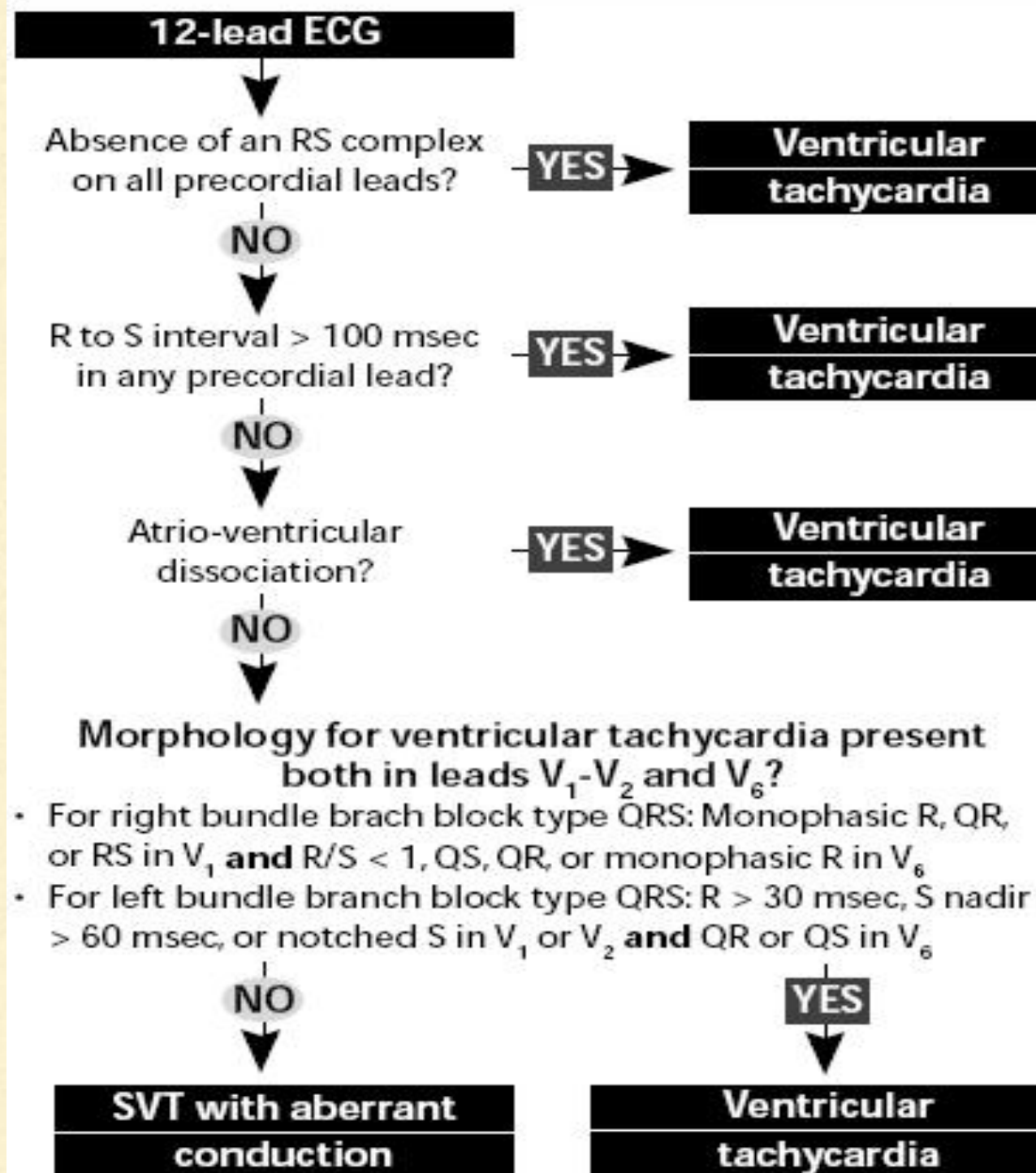
VT IS:

- FAST
- WIDE

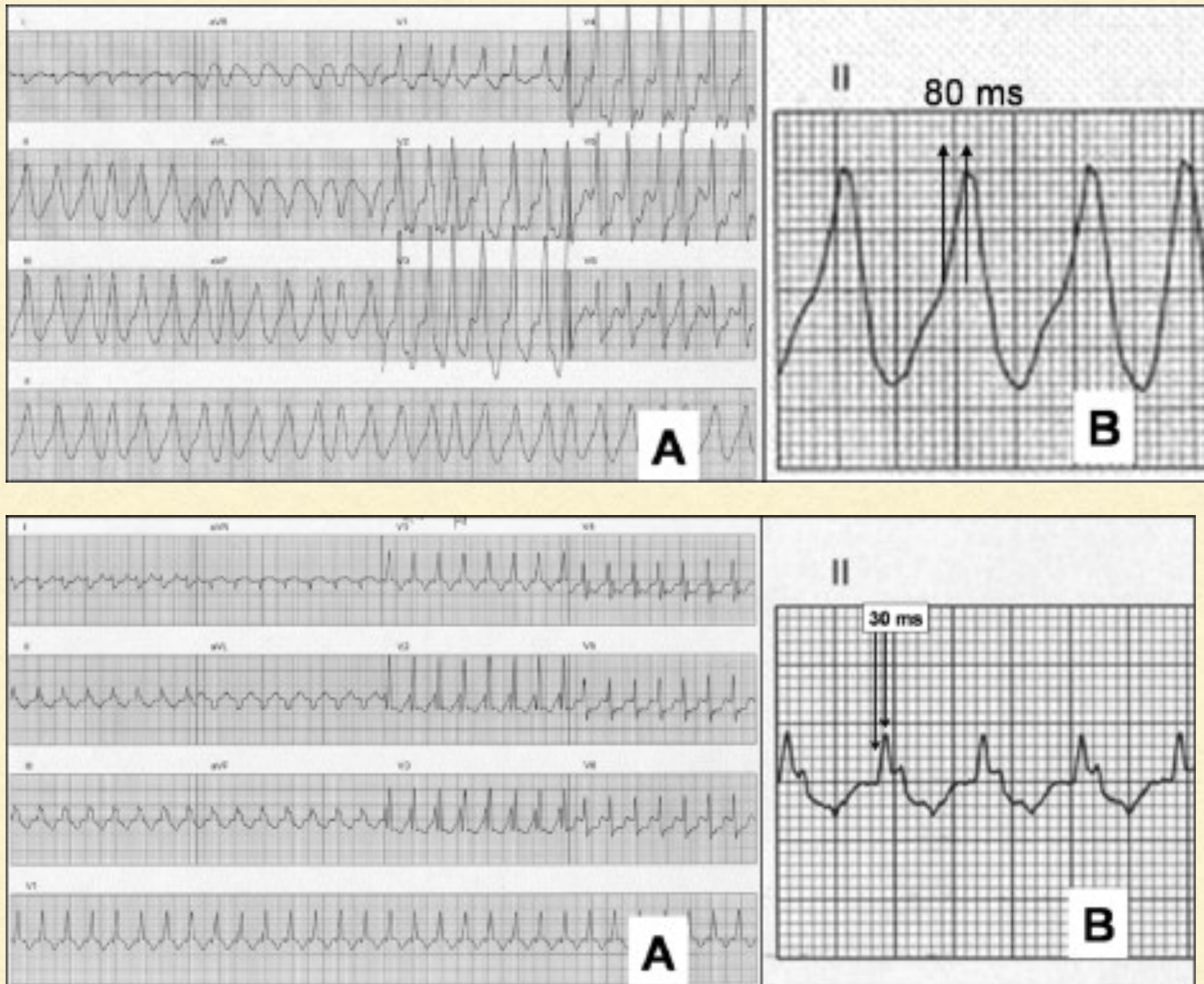
VENTRICULAR TACHYCARDIA IS:

- FAST
 - WIDE
 - HISTORY OF MI/ LOW EF
-

Figure 11. The Brugada Algorithm.



Source: Brugada P, Brugada J, Mont L, et al. A new approach to the differential diagnosis of a regular tachycardia with a wide QRS complex. *Circulation* 1991 May;83(5):1649-1659.

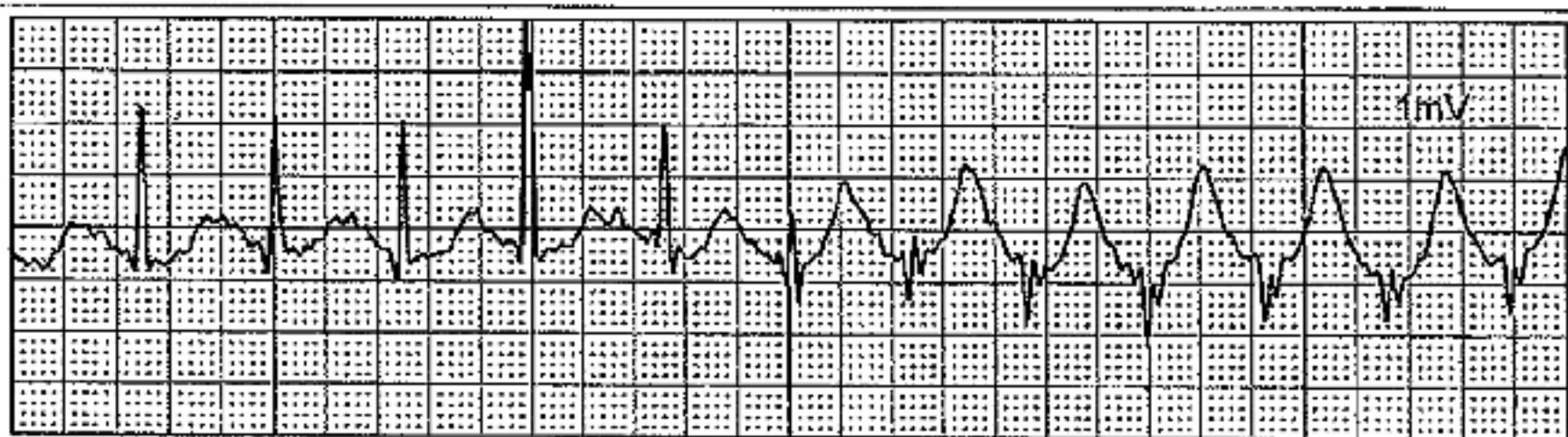


R-wave peak time at DII: A new criterion for differentiating between wide complex QRS tachycardias.
Pava et al. Heart Rhythm Volume 7, Issue 7 , Pages 922-926, July 2010

THE ELECTROPHYSIOLOGIST'S APPROACH

DIFFERENTIAL OF WIDE COMPLEX TACHYCARDIA

- VT
 - PRE-EXCITED TACHYCARDIA (WPW SYNDROME)
 - ABERRANCY
-



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NuStep

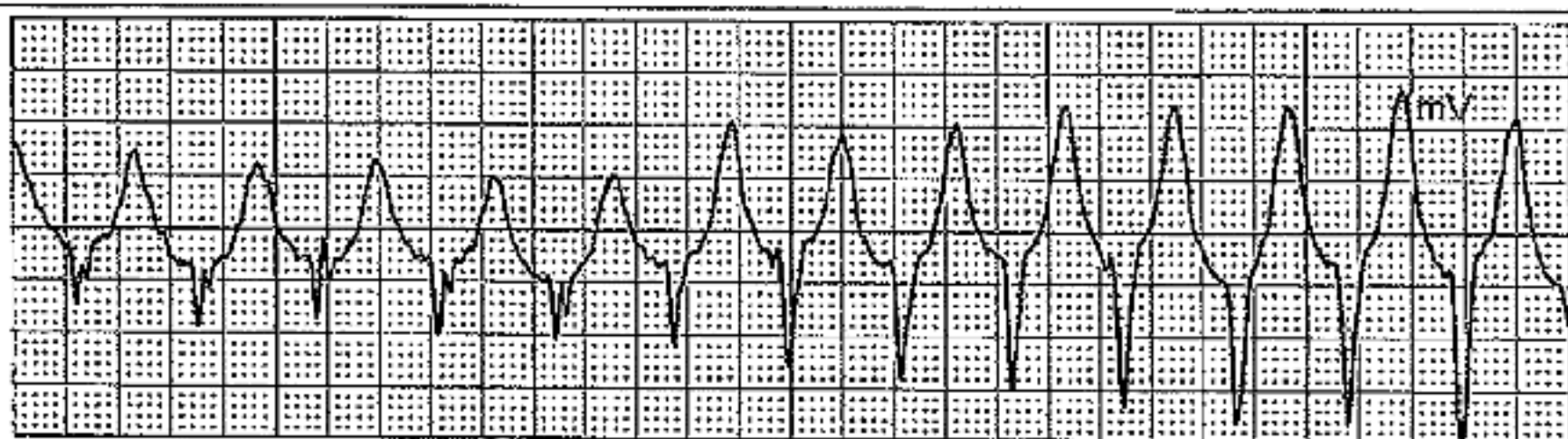
2 METs

30Watts@3

Elapsed Time: 39:39 Strip: 11

BP: NA

Session 1; 04/22/2014



136

NuStep

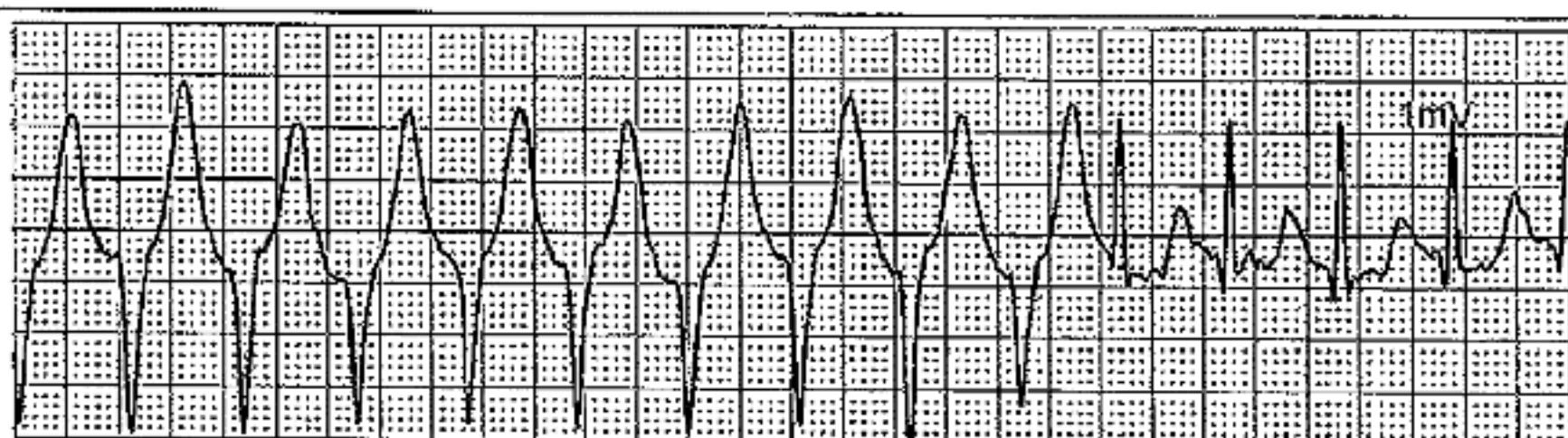
2 METs

30Watts@3

Elapsed Time: 39:45 Strip: 12

BP: NA

Session 1; 04/22/2014



139

NuStep

2 METs

30Watts@3

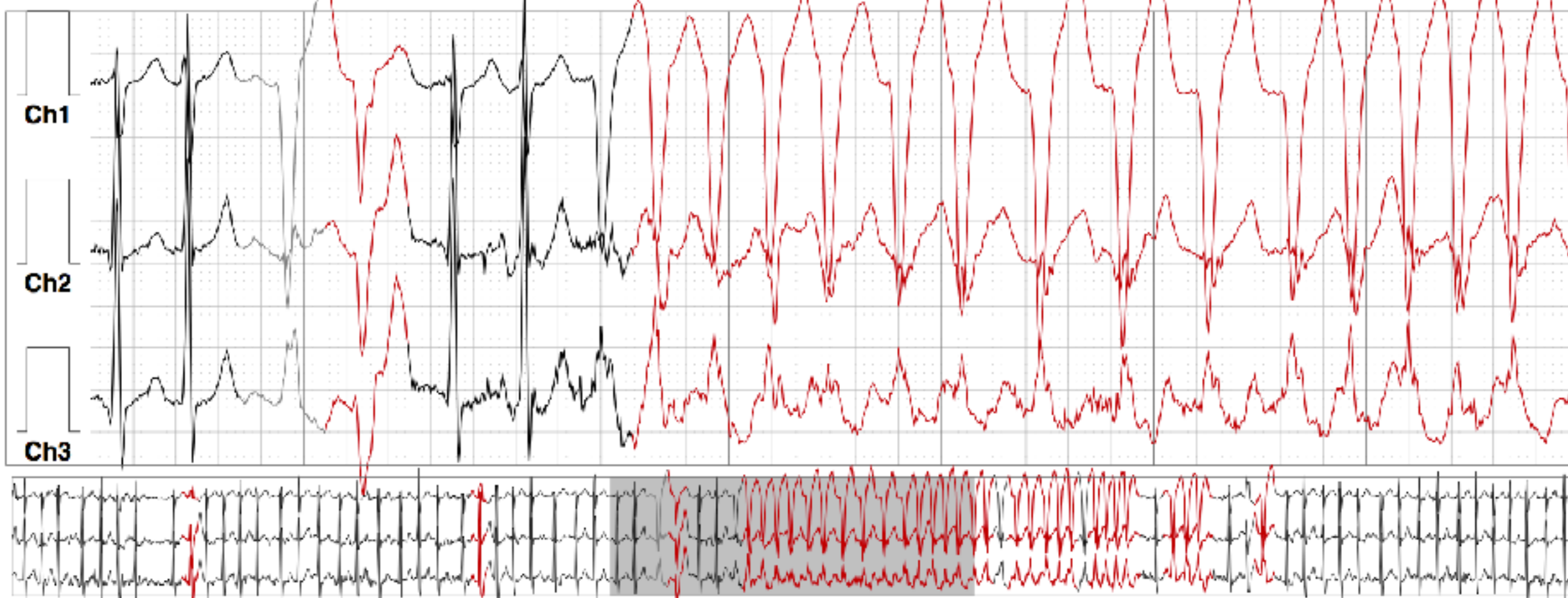
Elapsed Time: 39:51 Strip: 13

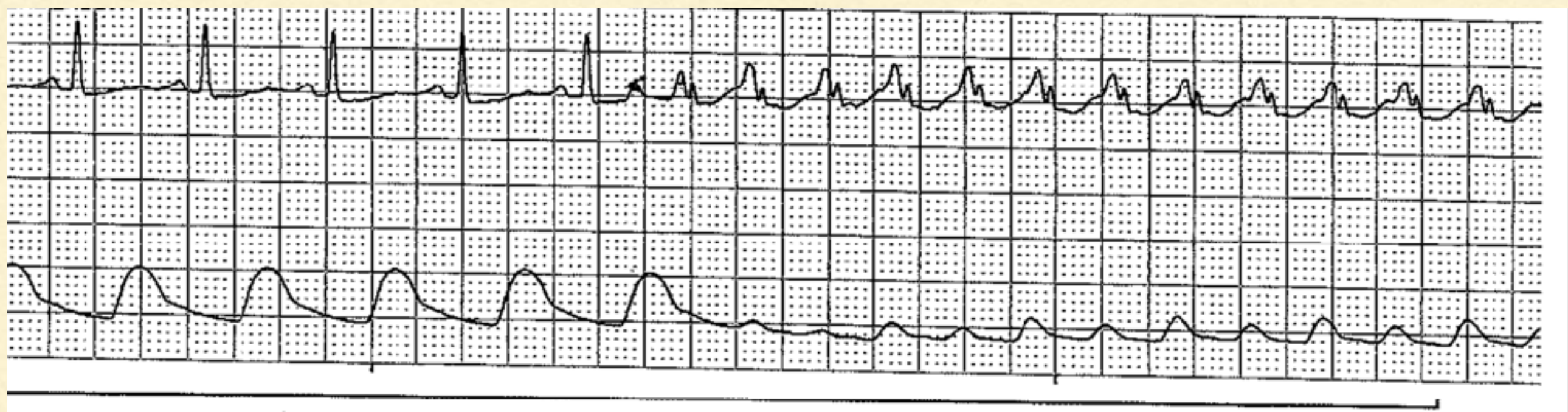
BP: NA

Session 1; 04/22/2014

5:24:48 AM 188 BPM Ventricular Run

Strip 6 of 16







TREATMENT

MANAGEMENT- STABLE TACHYCARDIA

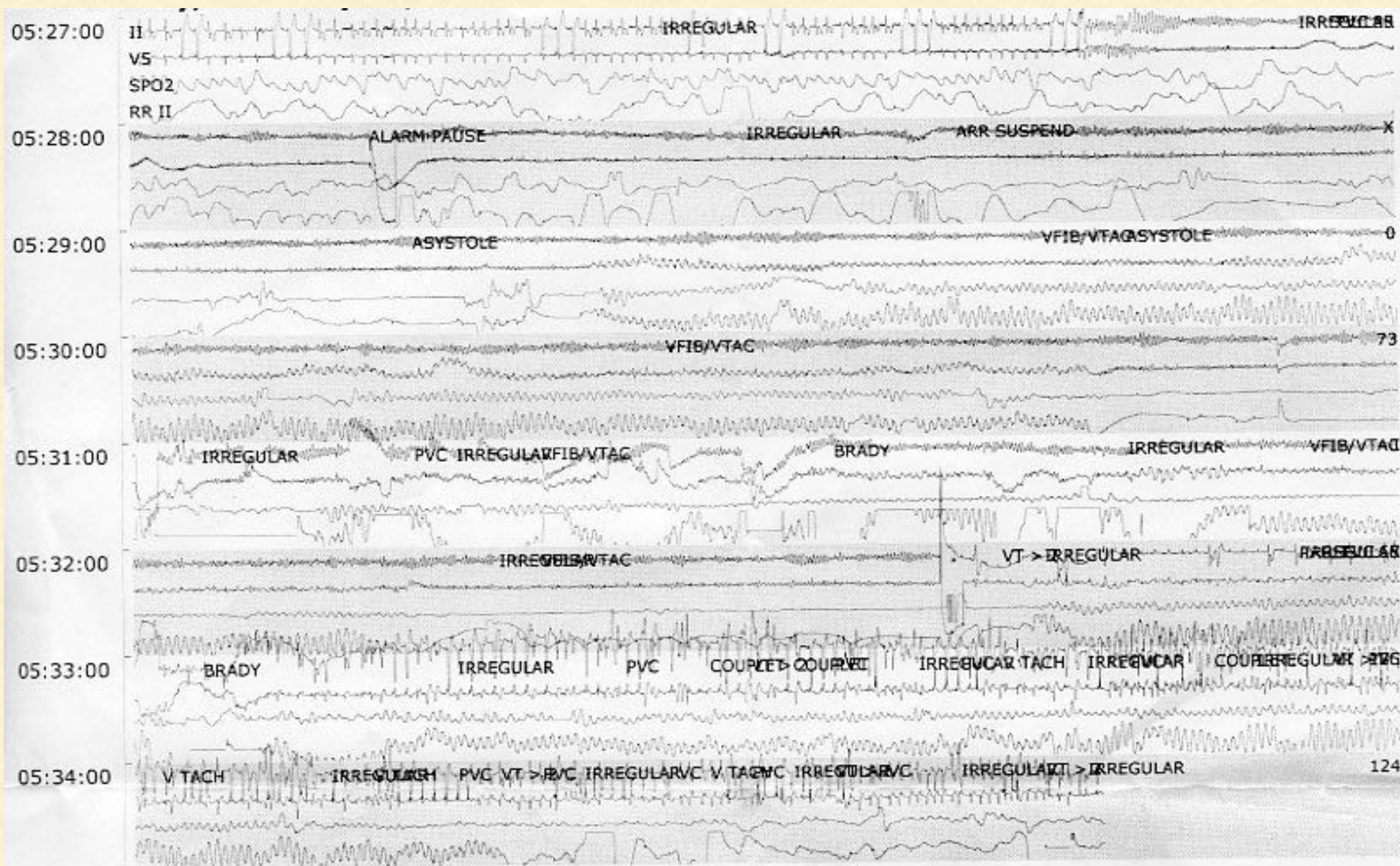
- Think about underlying etiologies: electrolytes, ischemia, hypoxia, hypercarbia, sepsis, shock, medications, baseline ECG
 - Consider pharmacological therapy
 - Amiodarone
 - Lidocaine
 - Procainamide
-

MANAGEMENT- UNSTABLE TACHYCARDIA

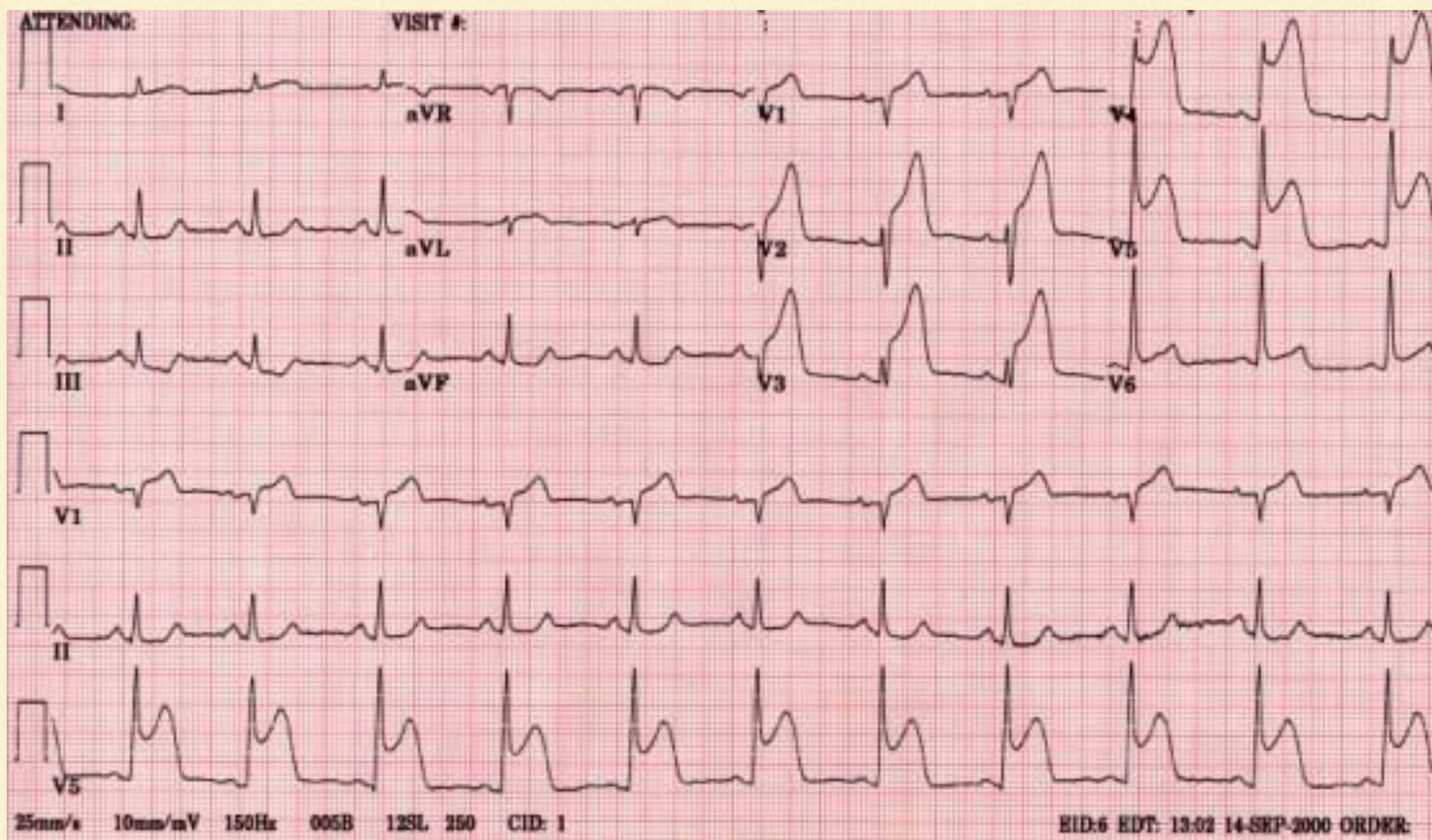
- “WHEN IN DOUBT, SHOCK IT OUT”
- THEN, CONTINUE MANAGEMENT AS FOR STABLE TACHYCARDIA

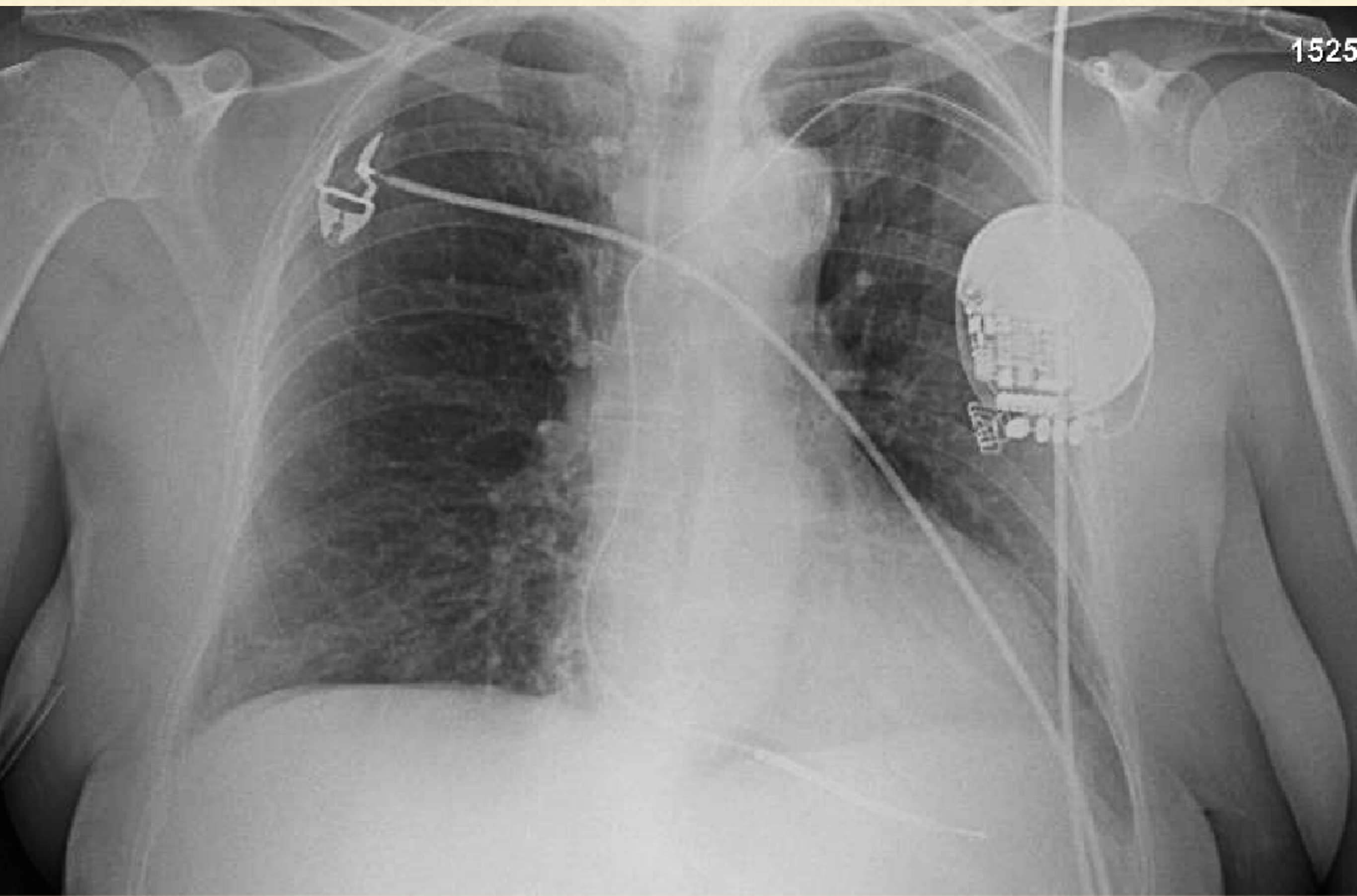


Cardiology Consult: “ICD didn’t work.”









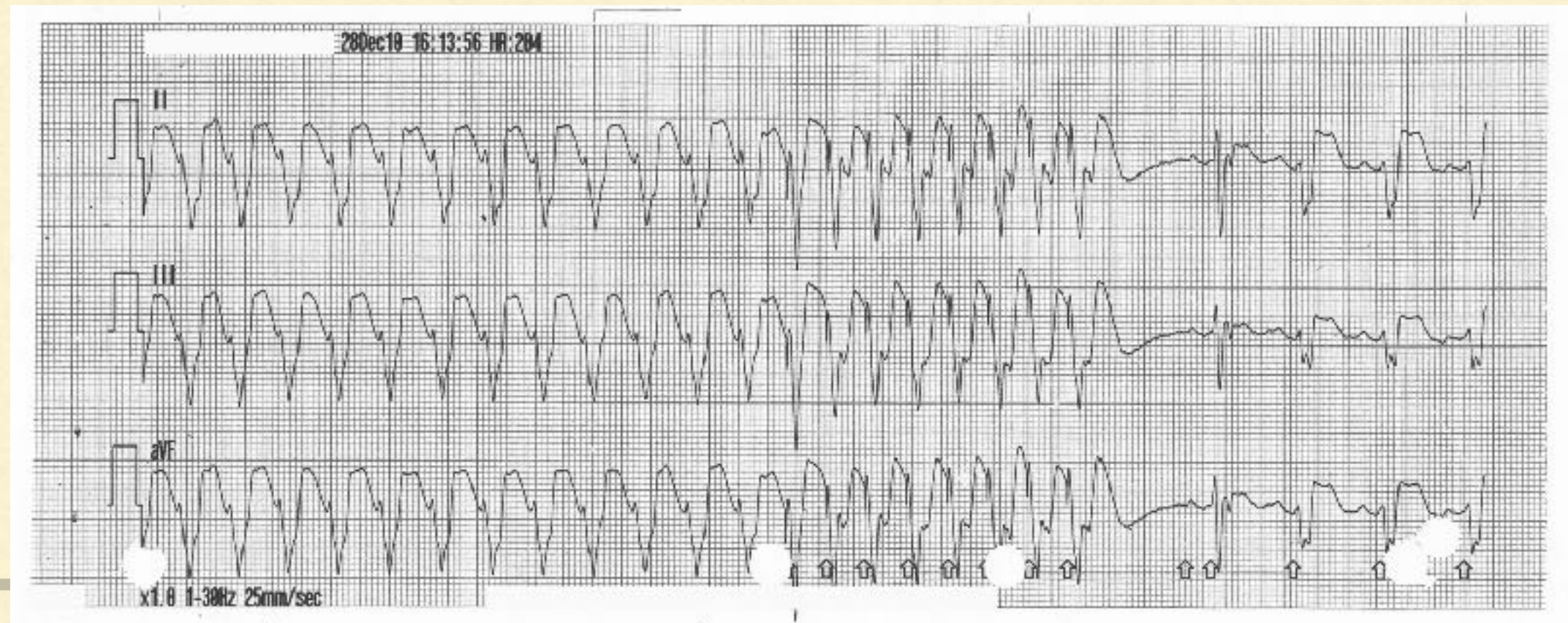
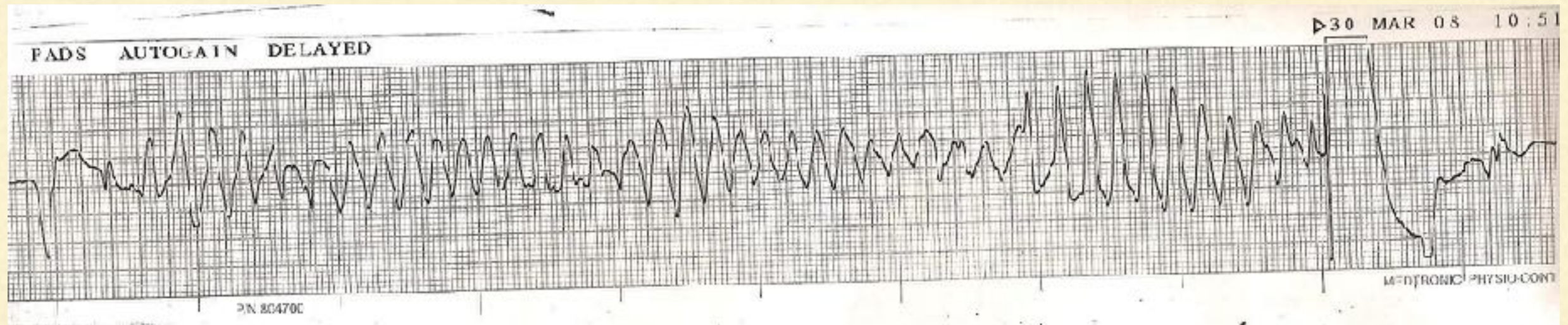


[H]

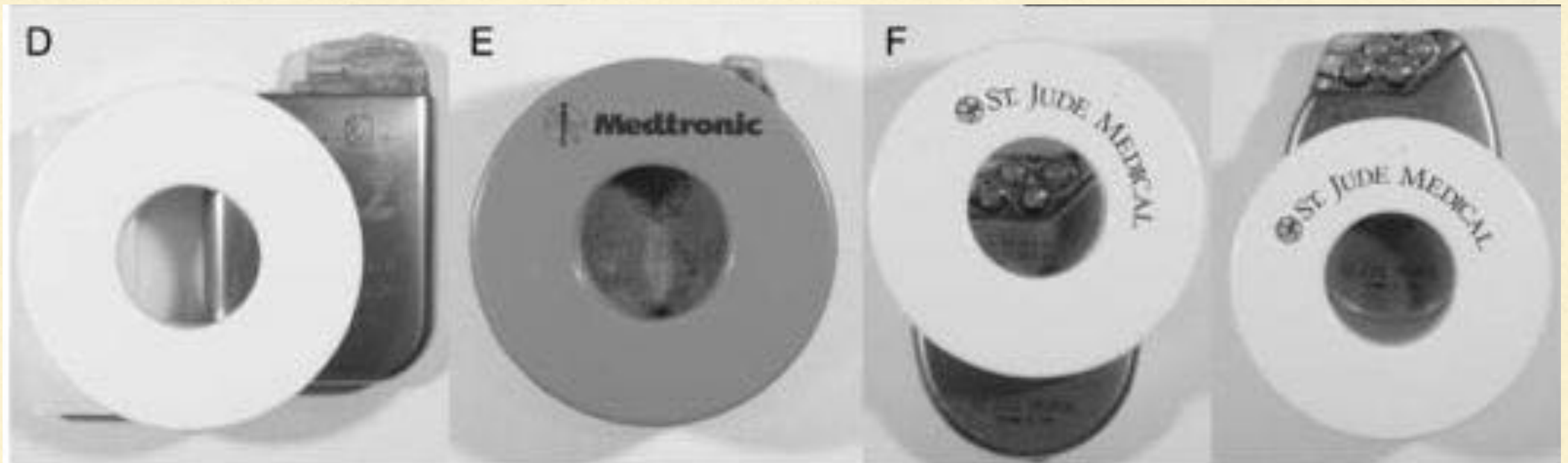
L
HP



DEFIBRILLATORS: HOW THEY WORK



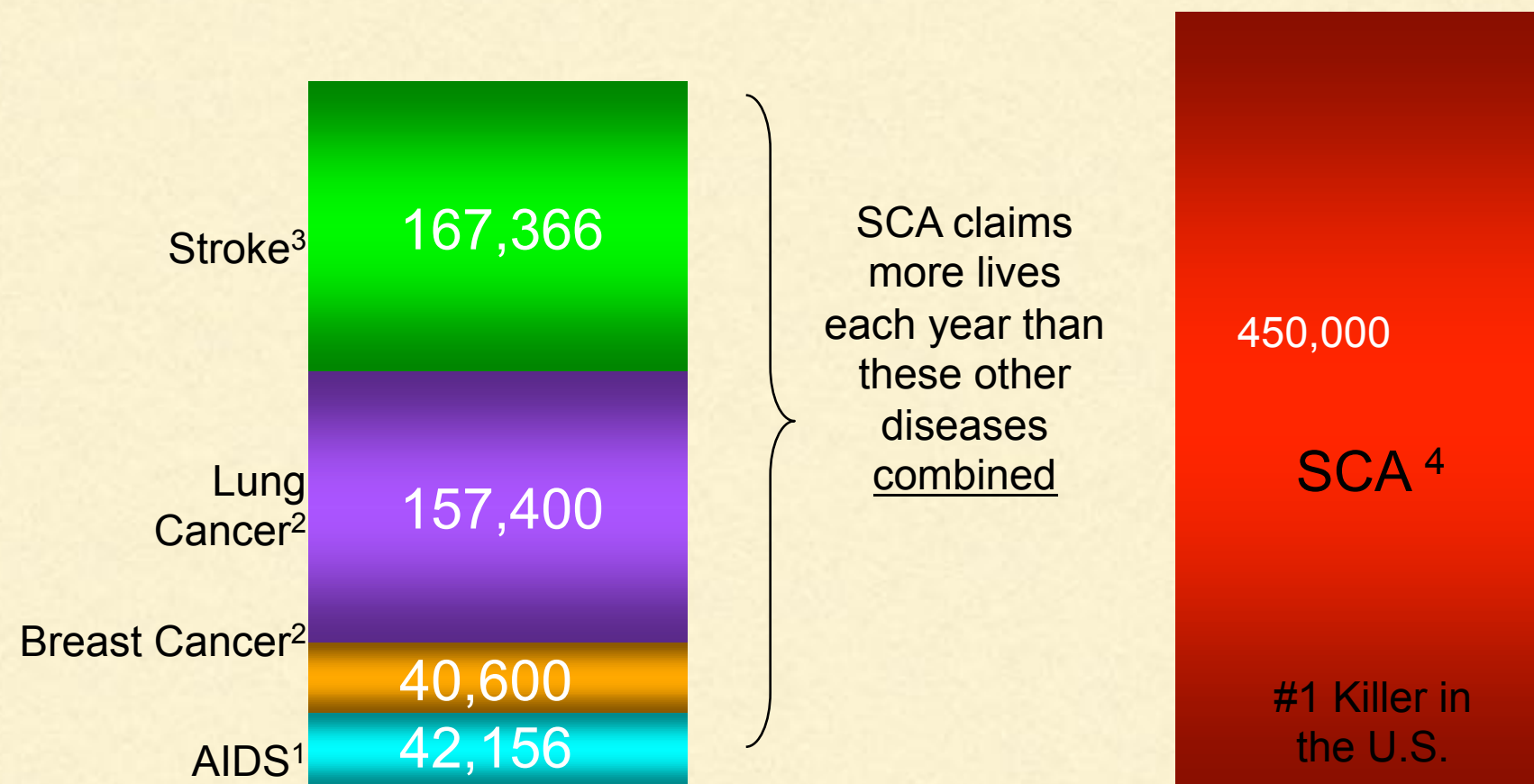
DEFIBRILLATORS: TROUBLESHOOTING



WHO NEEDS A DEFIBRILLATOR?



WHO NEEDS A DEFIBRILLATOR?



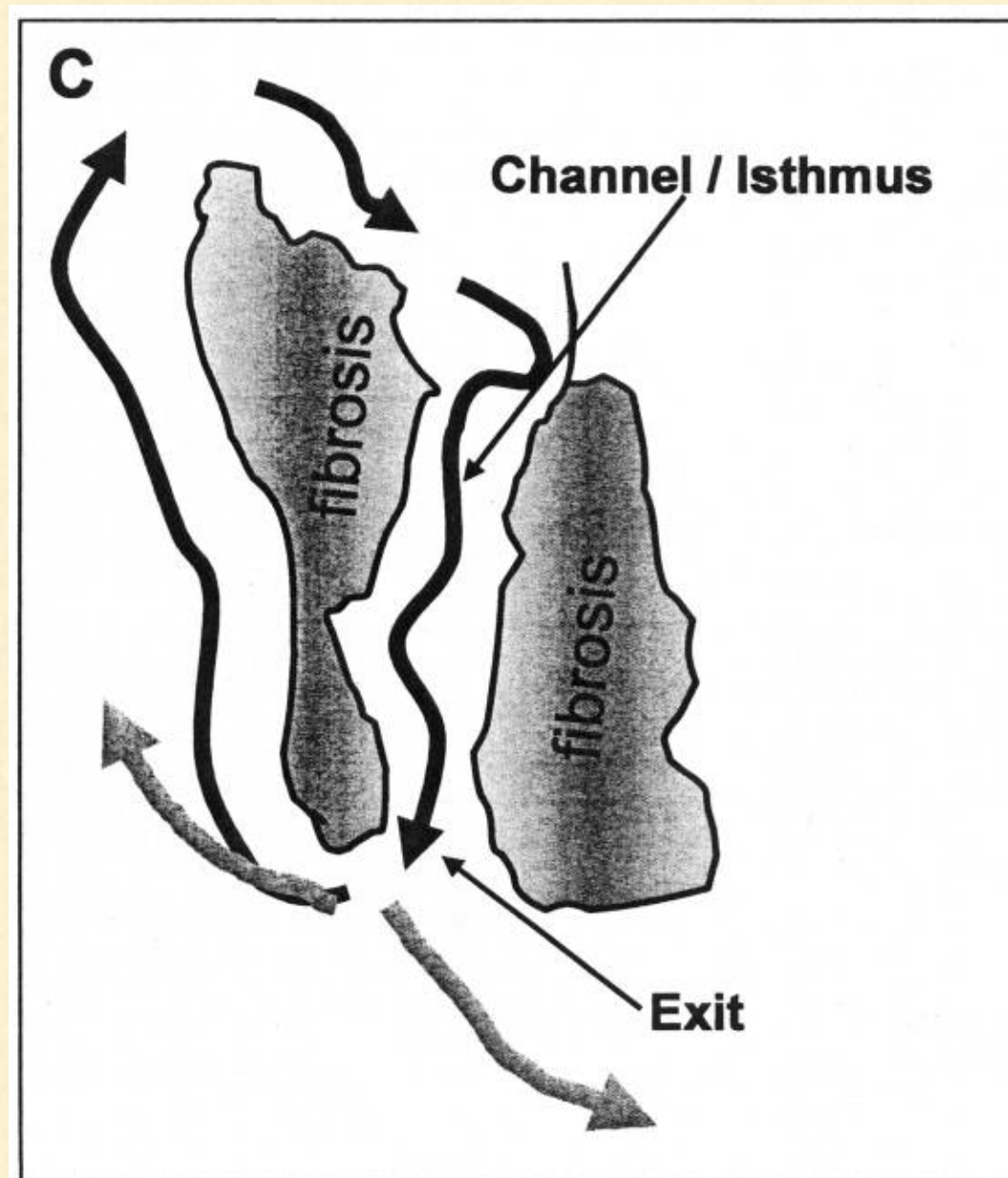
¹ U.S. Census Bureau, *Statistical Abstract of the United States: 2001*.

² American Cancer Society, Inc., *Surveillance Research, Cancer Facts and Figures 2001*.

³ *2002 Heart and Stroke Statistical Update*, American Heart Association.

⁴ *Circulation*. 2001;104:2158-2163.

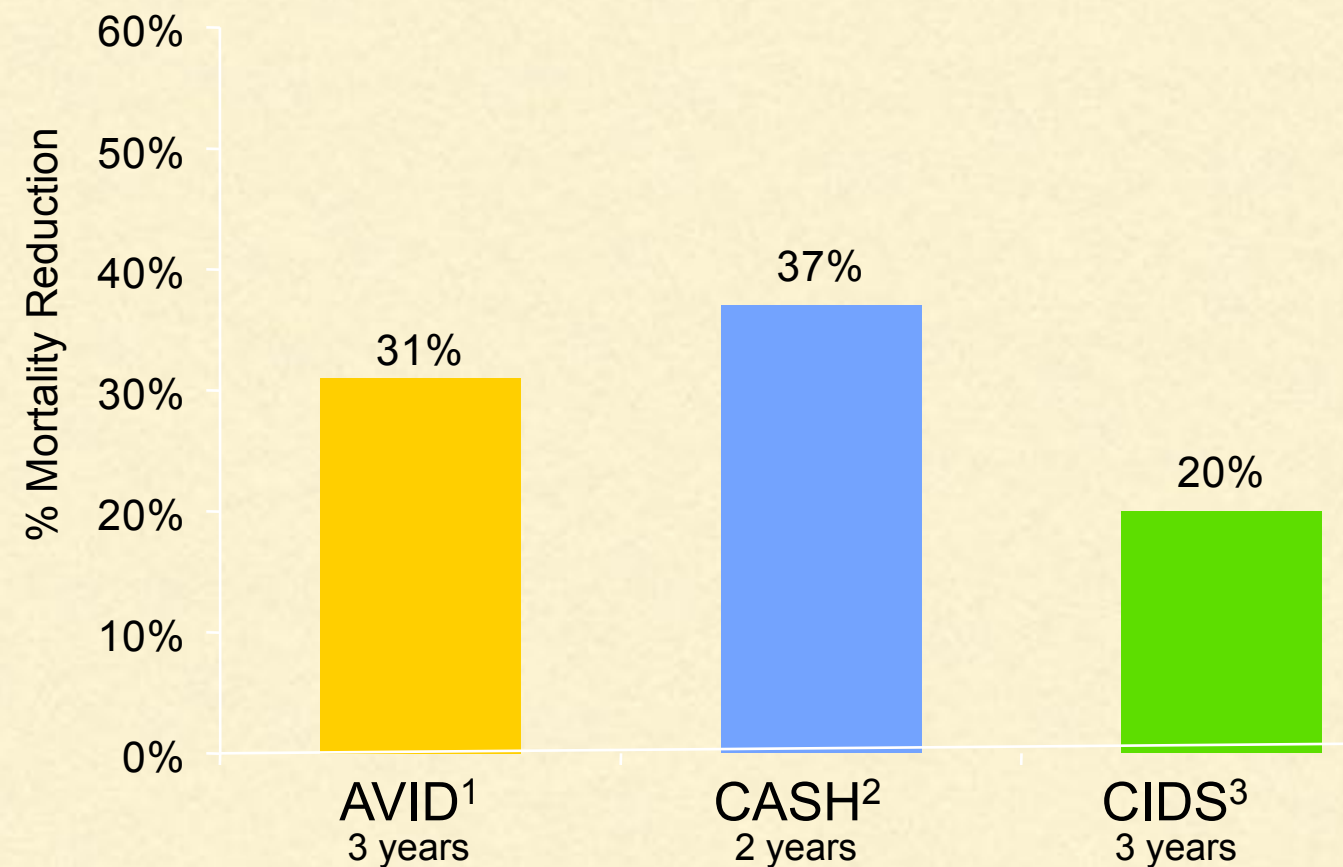
WHO NEEDS A DEFIBRILLATOR?



WHO NEEDS A DEFIBRILLATOR?

- Survivors
 - Syncope
 - Scar
 - Rare situations (Brugada syndrome, ARVC, infiltrative cardiomyopathies, etc.)
-

SURVIVORS/ SECONDARY PREVENTION



¹ The AVID Investigators. N Engl J Med. 1997;337:1576-1583.

² Kuck K. ACC98 News Online. April, 1998. Press release.

³ Connolly S. ACC98 News Online. April, 1998. Press release.

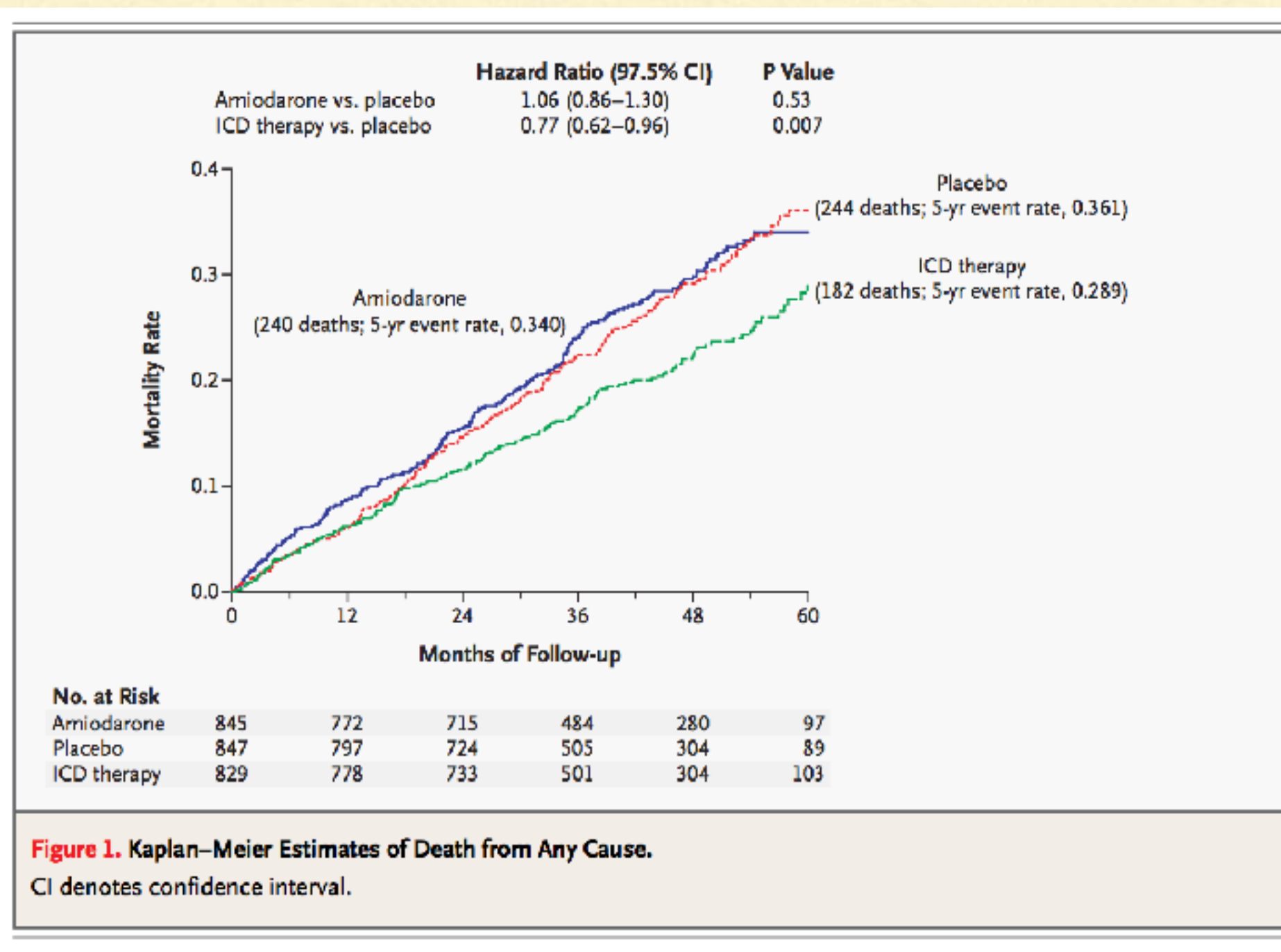
⁴ Moss AJ. N Engl J Med. 1996;335:1933-1940.

SYNCOPE

- Take a careful history and physical
 - Cardiac syncope: sudden, often traumatic, history of CAD
 - NSVT: risk factor
 - Consider EP study
 - ICD is indicated for cardiac syncope and low EF
-

SCAR

- $EF \leq 35\%$
 - $EF \leq 40\%$, NSVT, positive EP study
-



Bardy et al. SCD-HeFT Trial. NEJM 352:3



PRIMARY PREVENTION TRIALS

MADIT I
MUSTT
MADIT II
SCD-HeFT
DINAMIT, IRIS
CABG Patch
DEFINITE
COMPANION

WHO SHOULD NOT RECEIVE AN ICD

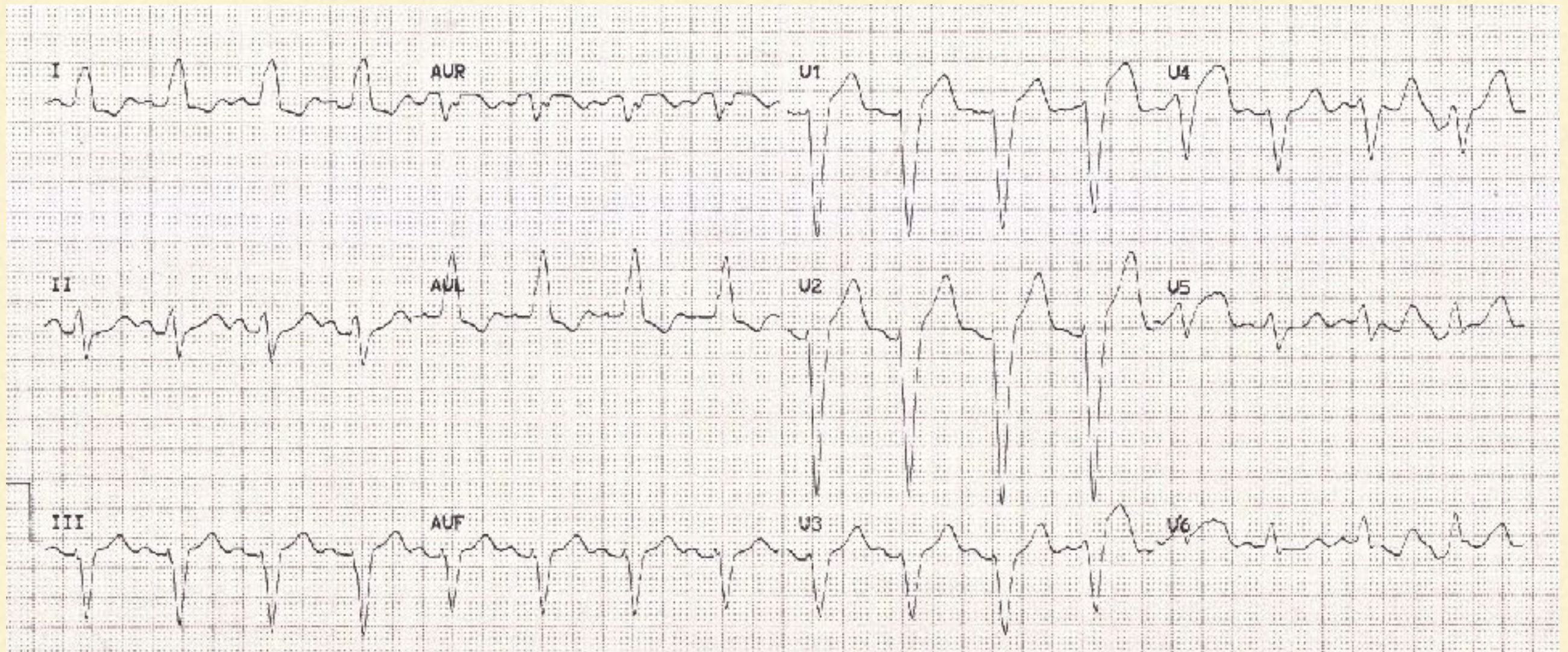
- Class I CHF (unless $EF \leq 30\%$ with ICM)
 - Patients with a reversible cause
 - Revascularizable, <40 days from infarct, <3 months from revasc.
 - Cardiomyopathy that may improve with medical therapy
 - NICM: EF persistently low despite 3 months of Rx
 - Life expectancy < 1 year; class IV CHF (unless BiV-ICD)
-

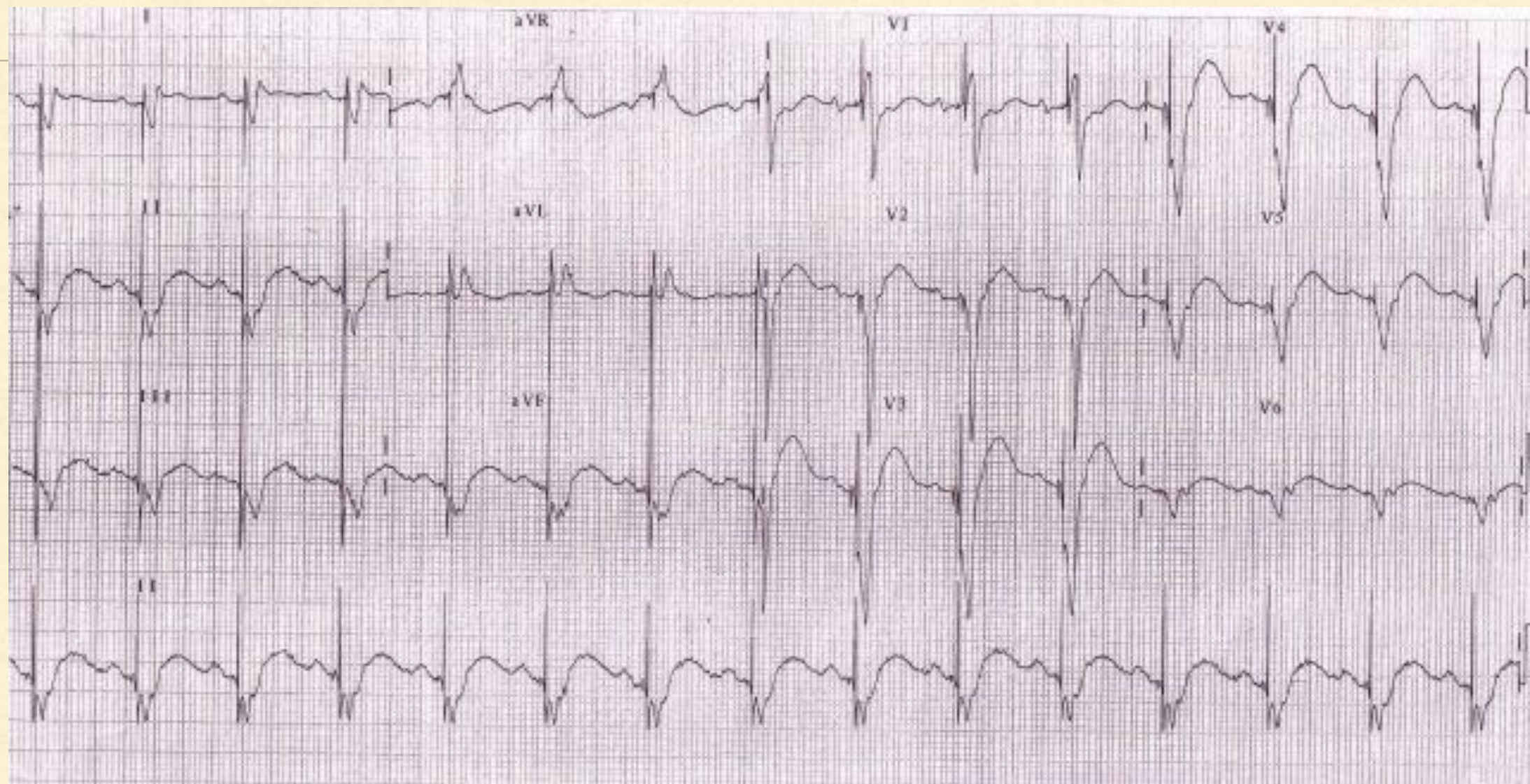


LifeVest

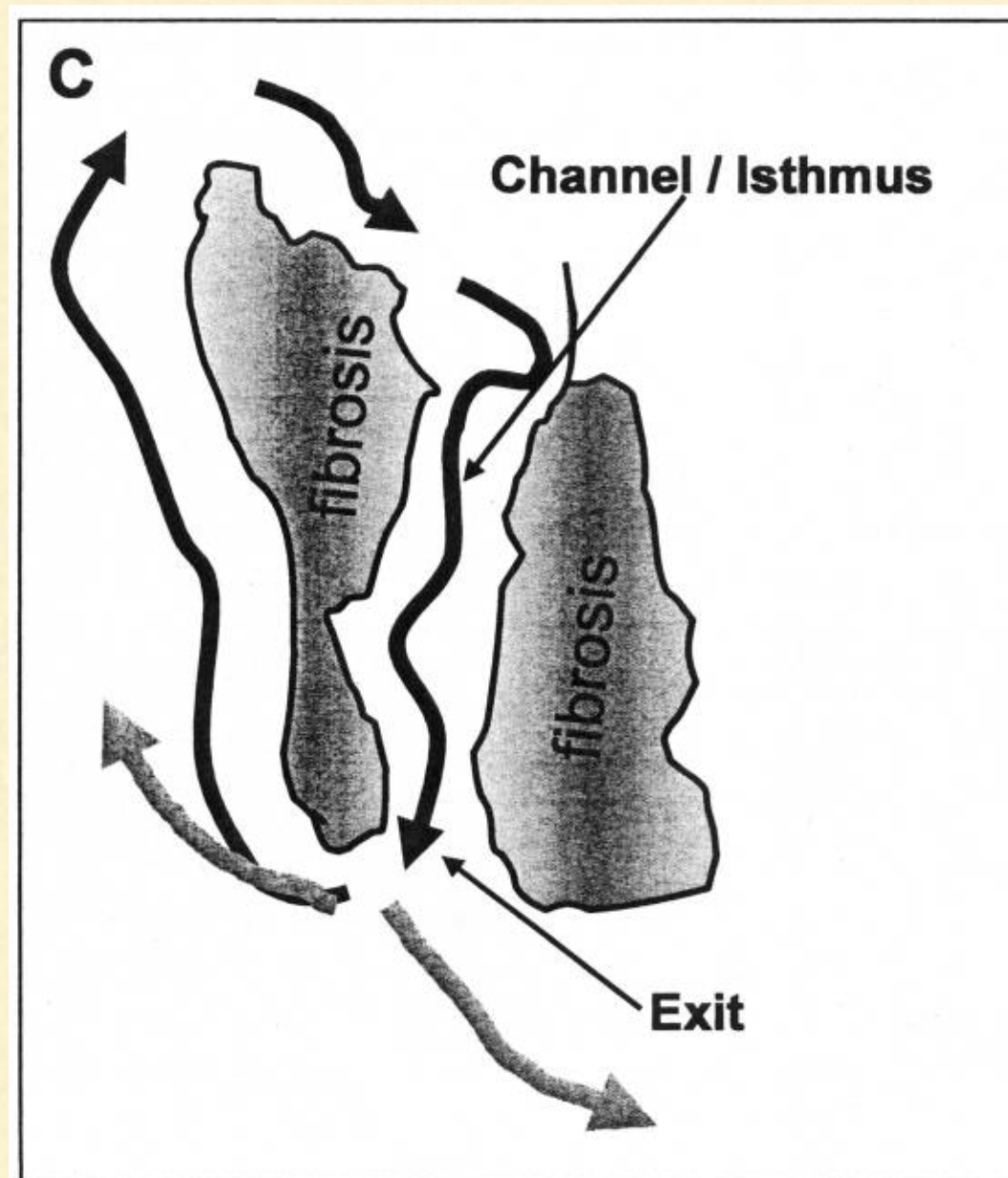


CARDIAC RESYNCHRONIZATION THERAPY

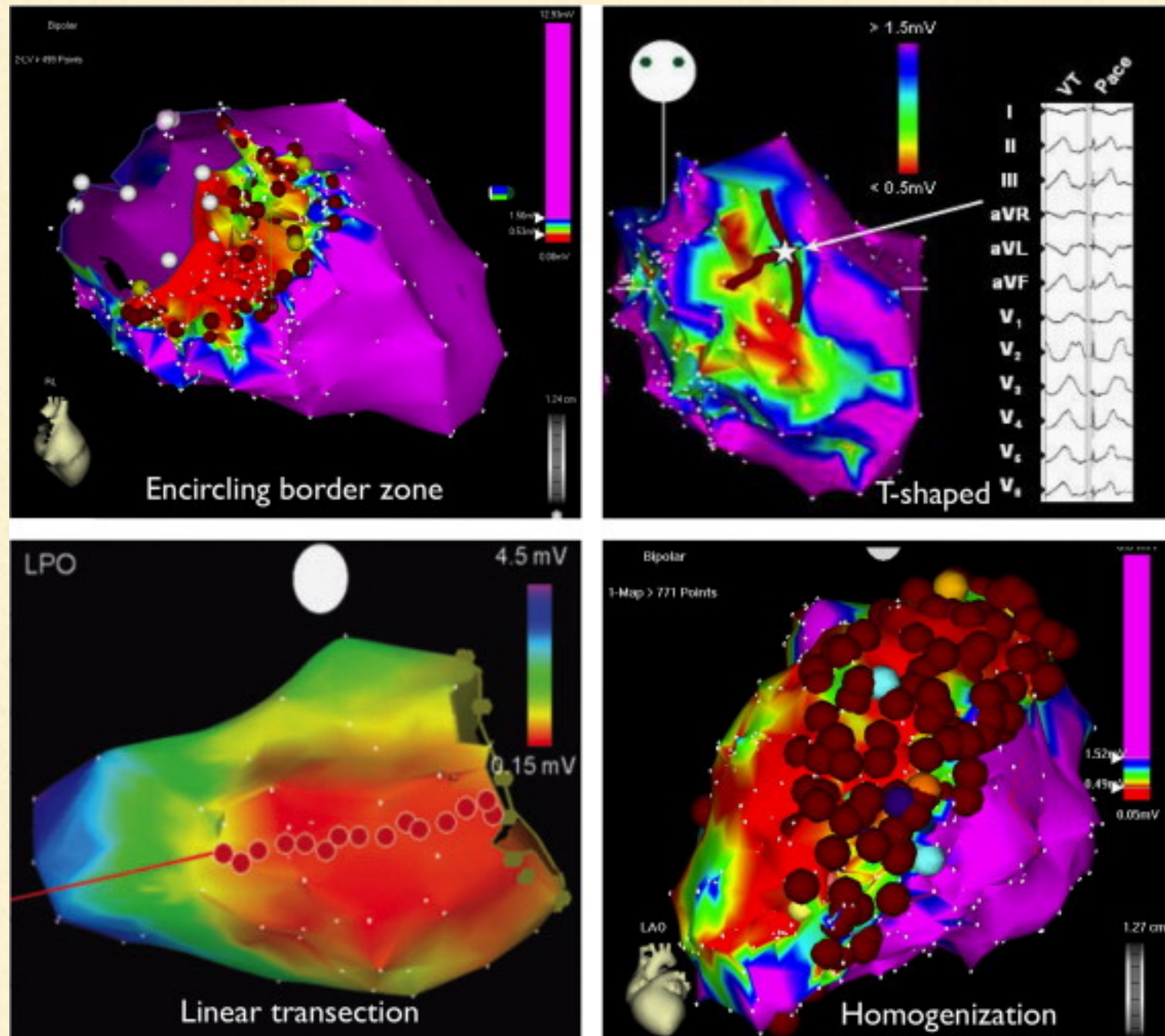




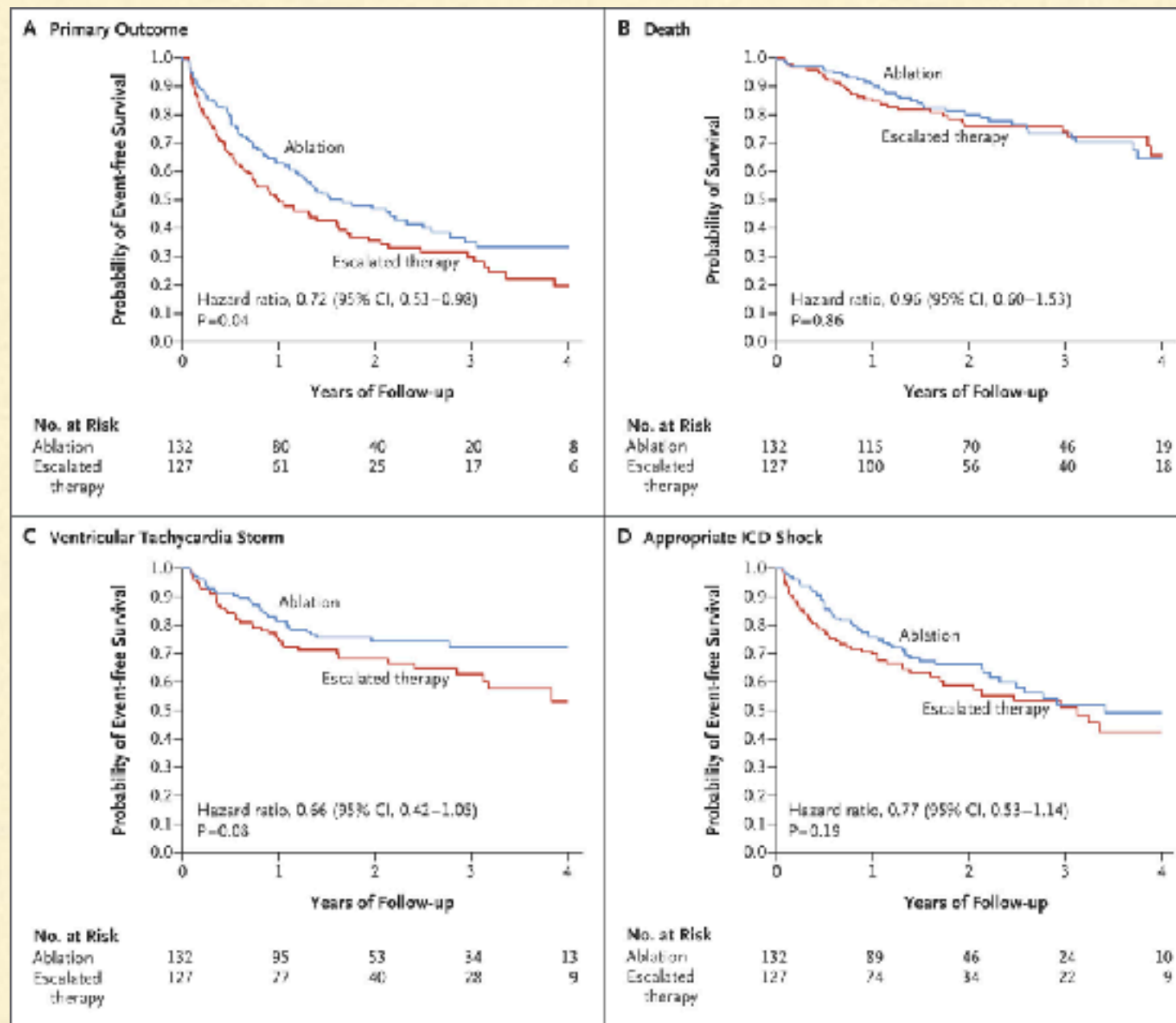
VT ABLATION



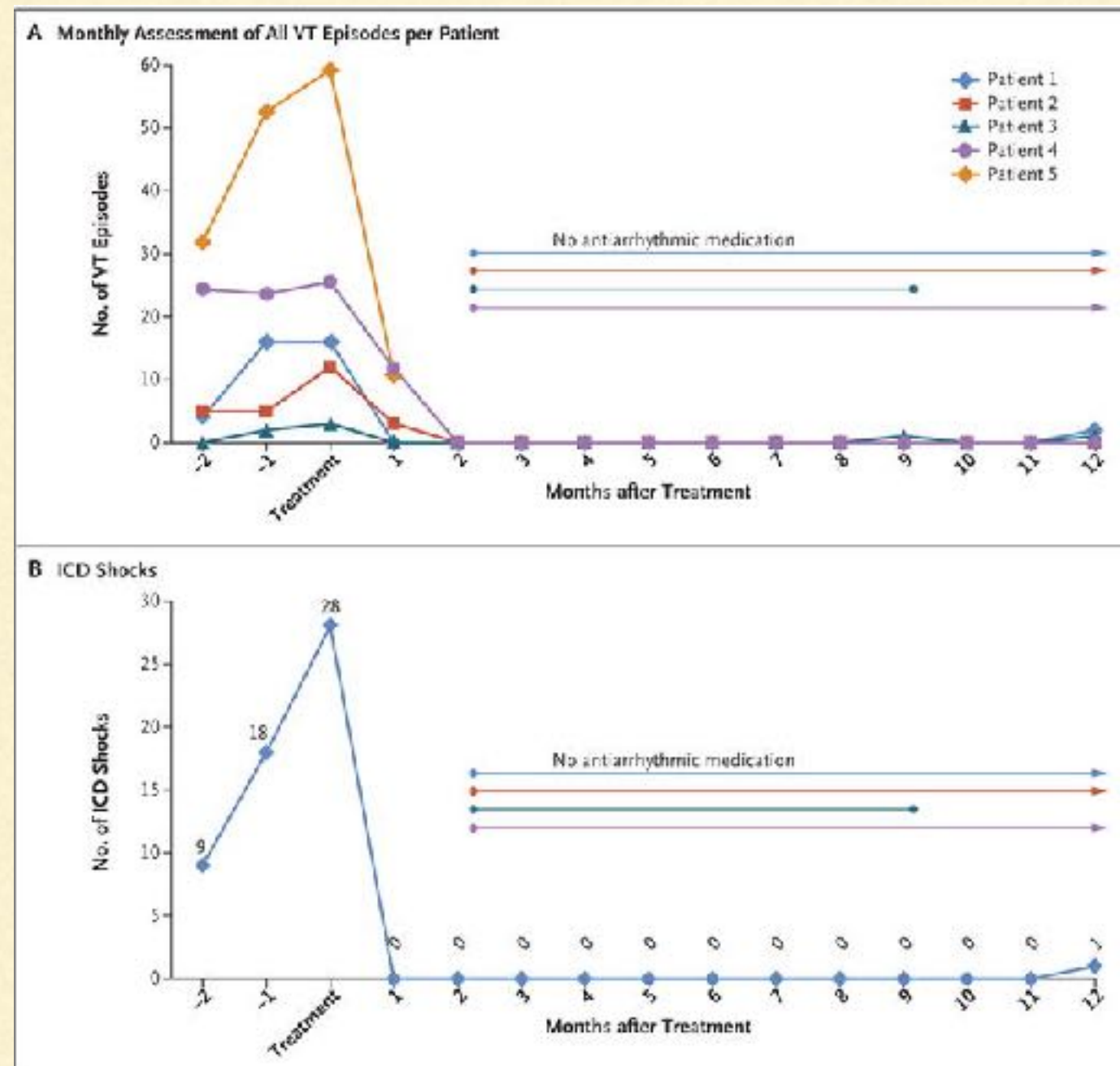
VT ABLATION



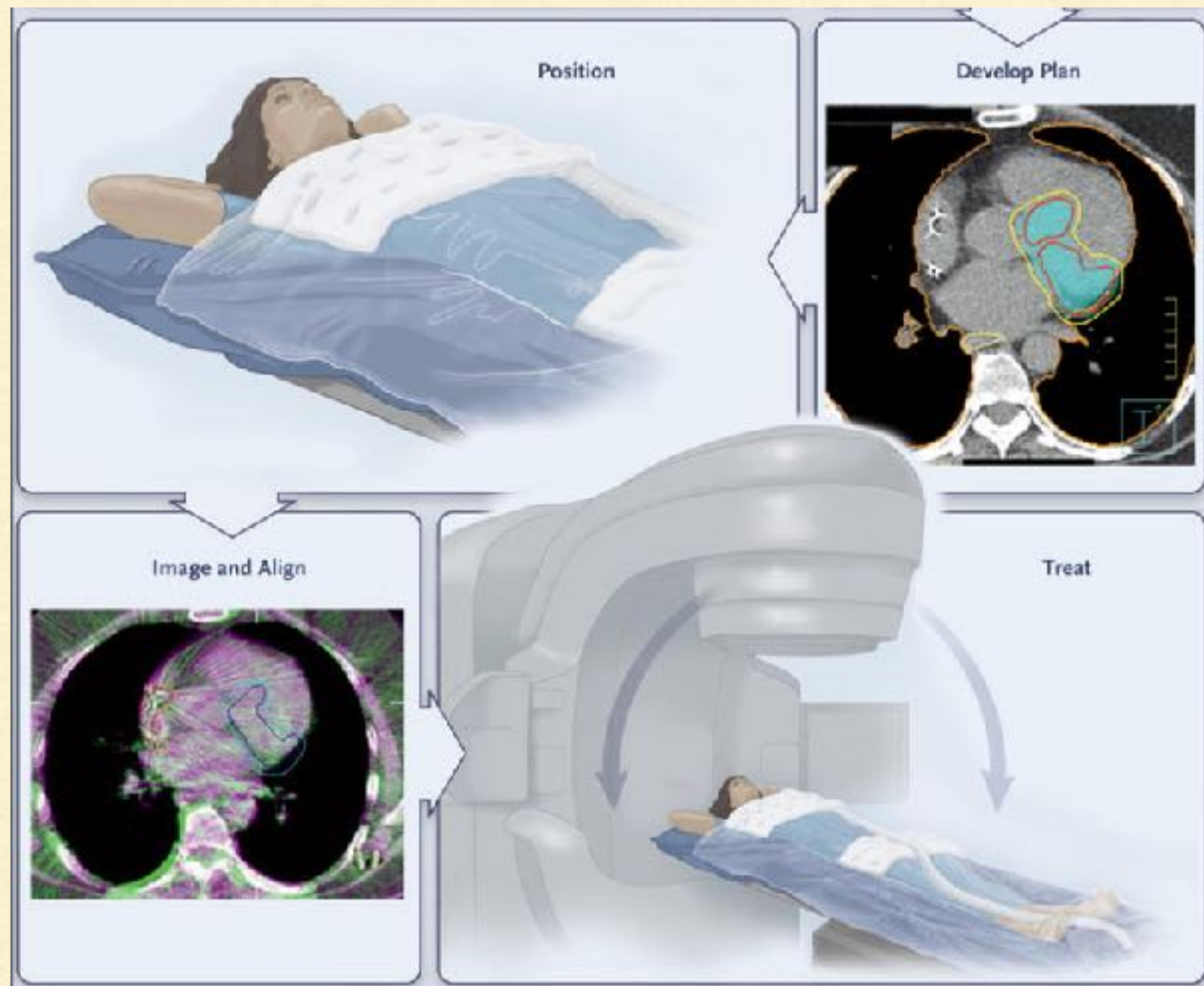
VT ABLATION



VT ABLATION



VT ABLATION



THE END

