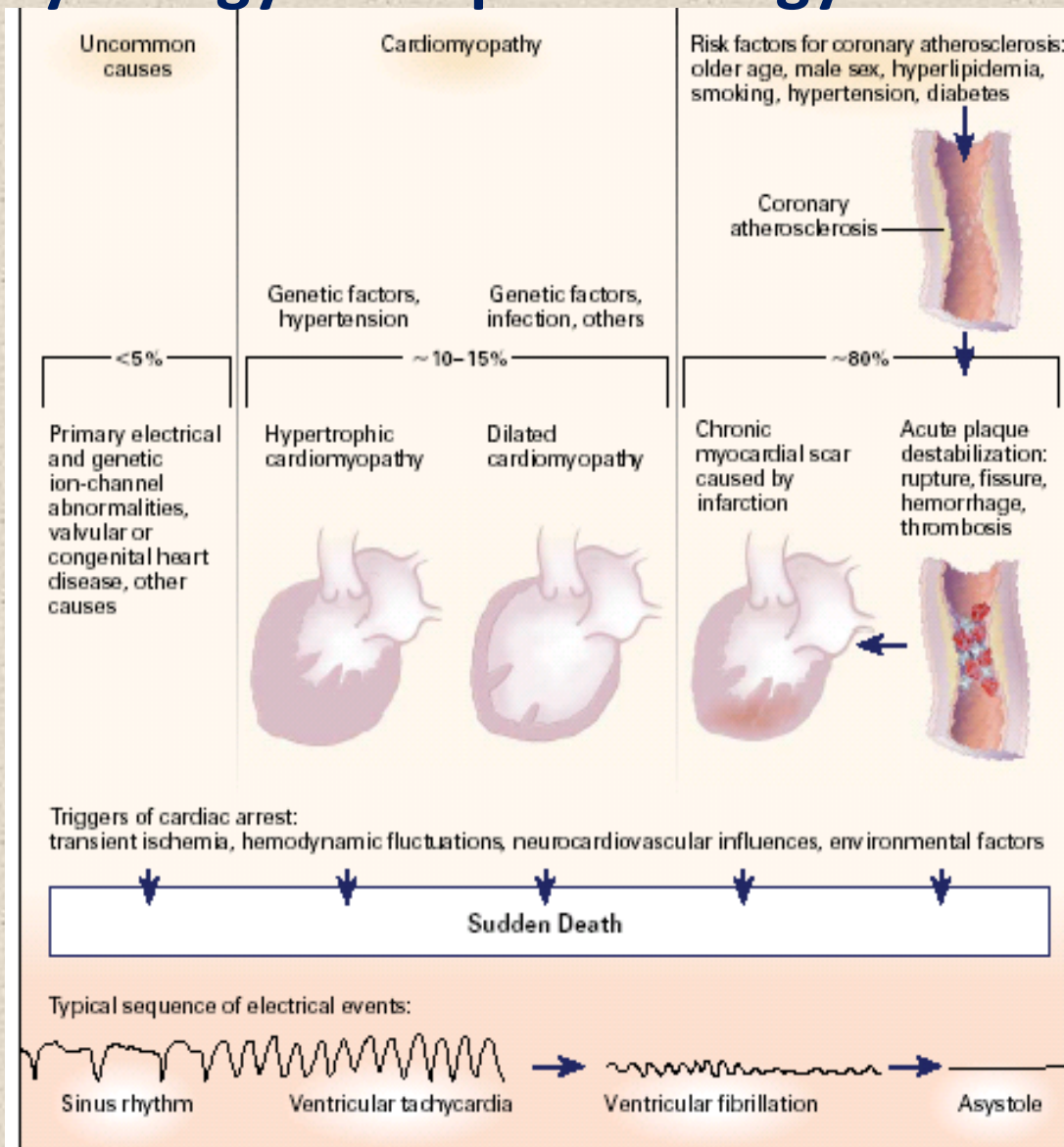


What every sudden cardiac death survivor should get: diagnostic and therapeutic work-up

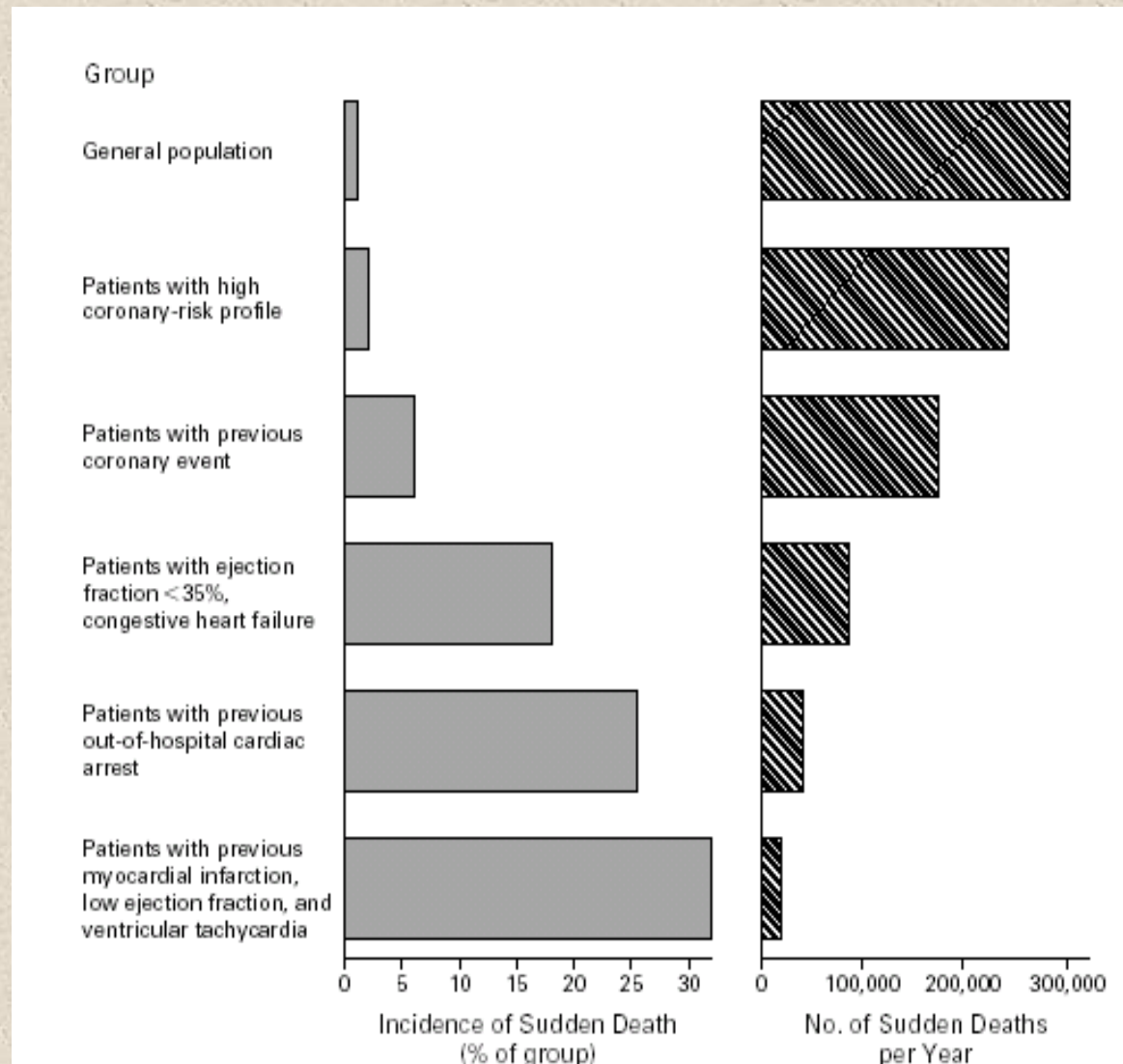
Prof. Dr. Martin Borggrefe
Mannheim

Advances in cardiac arrhythmias and great innovations in cardiology
Turin, September 27-28, 2013

Pathophysiology and Epidemiology of SCD



The incidence of SCD in specific populations



Out-of-Hospital cardiac arrest

n = 515 pts

72% male

age 62 ± 9 yrs

history of cardiac disease 54%

SCA

53% women

44% men



first manifestation of heart disease

MI – SCA 6. Median 5 yrs

Yearly incidence of SCA

~ 10 / 10.000

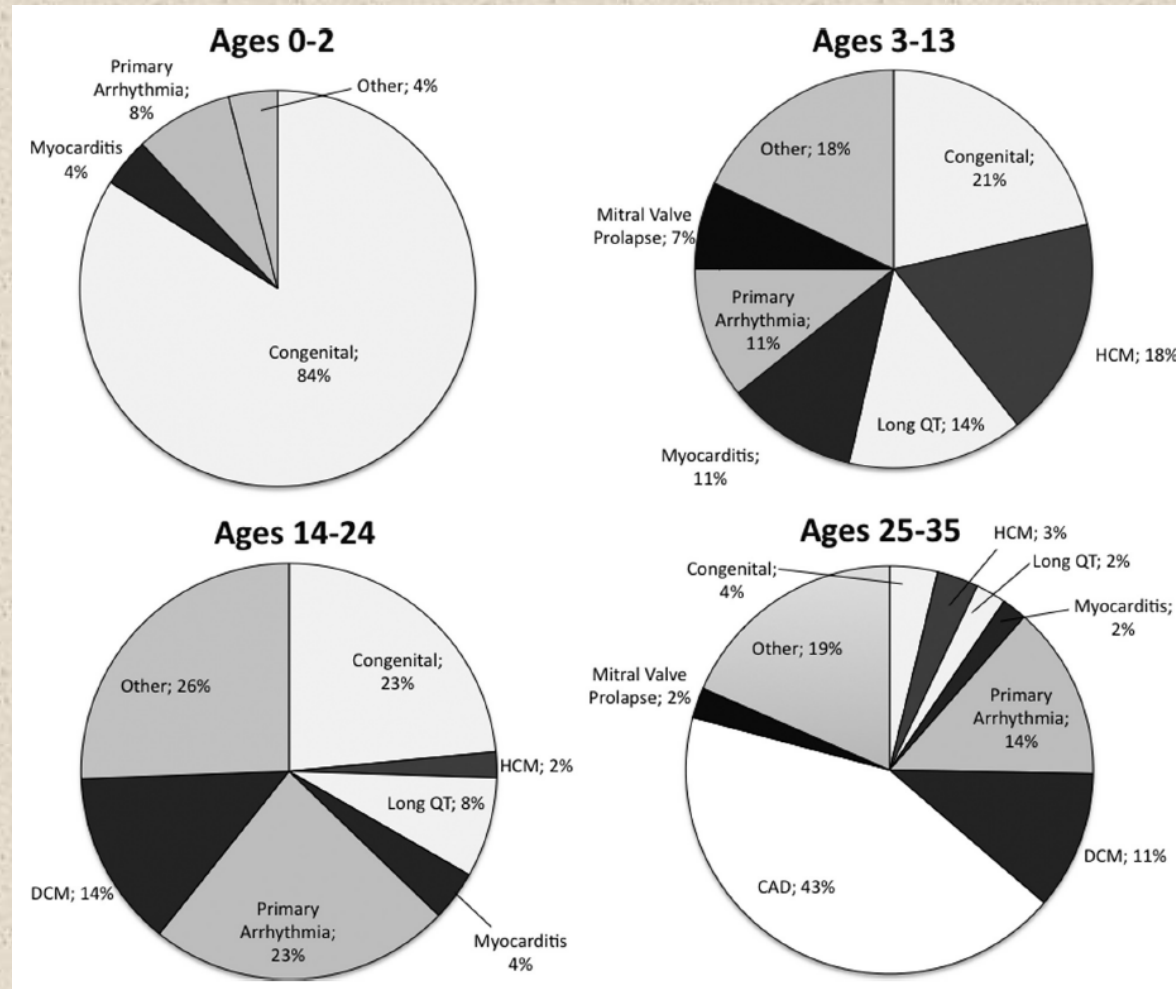
Out-of-Hospital cardiac arrest

Site of Sudden Cardiac Arrest in 501 Victims

	No.	%
At home	399	79,6
On street	47	9.4
Public place	31	6.2
Other places	16	3.2
At general practitioner's home	4	0.8
At work	4	0.8

Sudden cardiac arrest in children and young adults

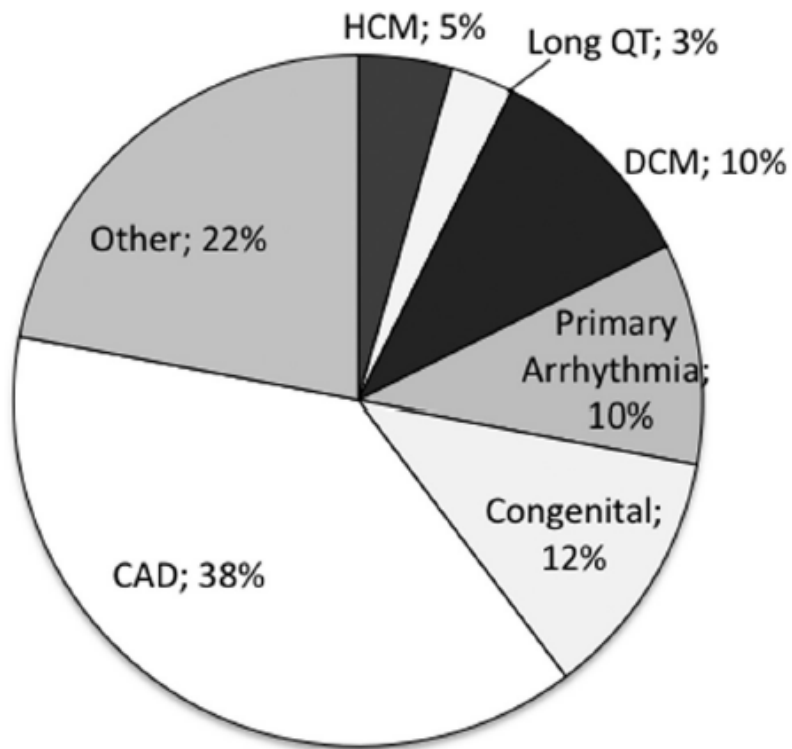
Causes of arrest by age group



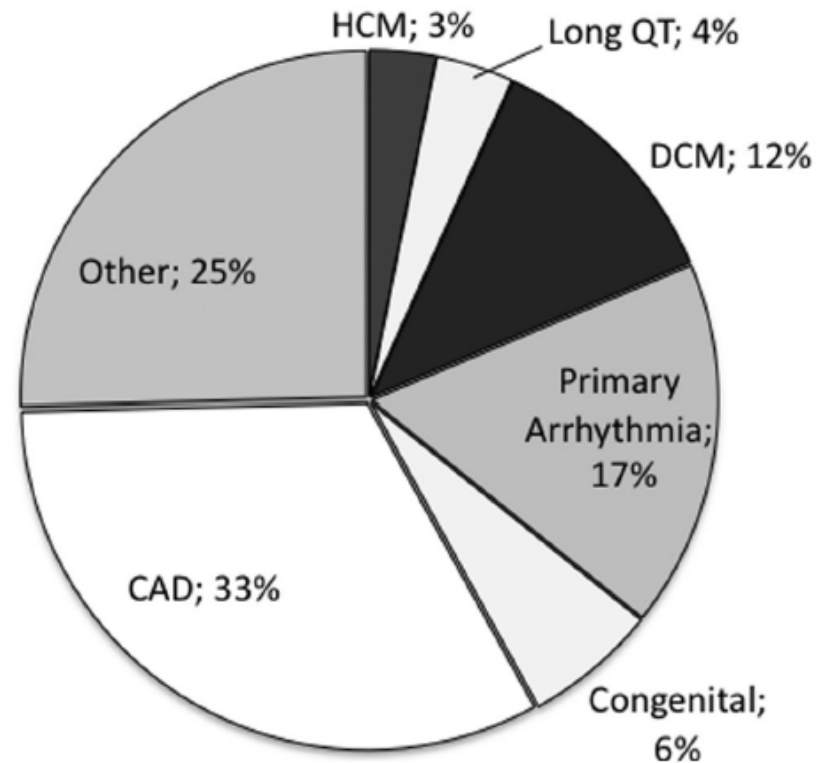
Sudden cardiac arrest in children and young adults

Exercise- and non-exercise-related causes in individuals 14 to 35 years of age

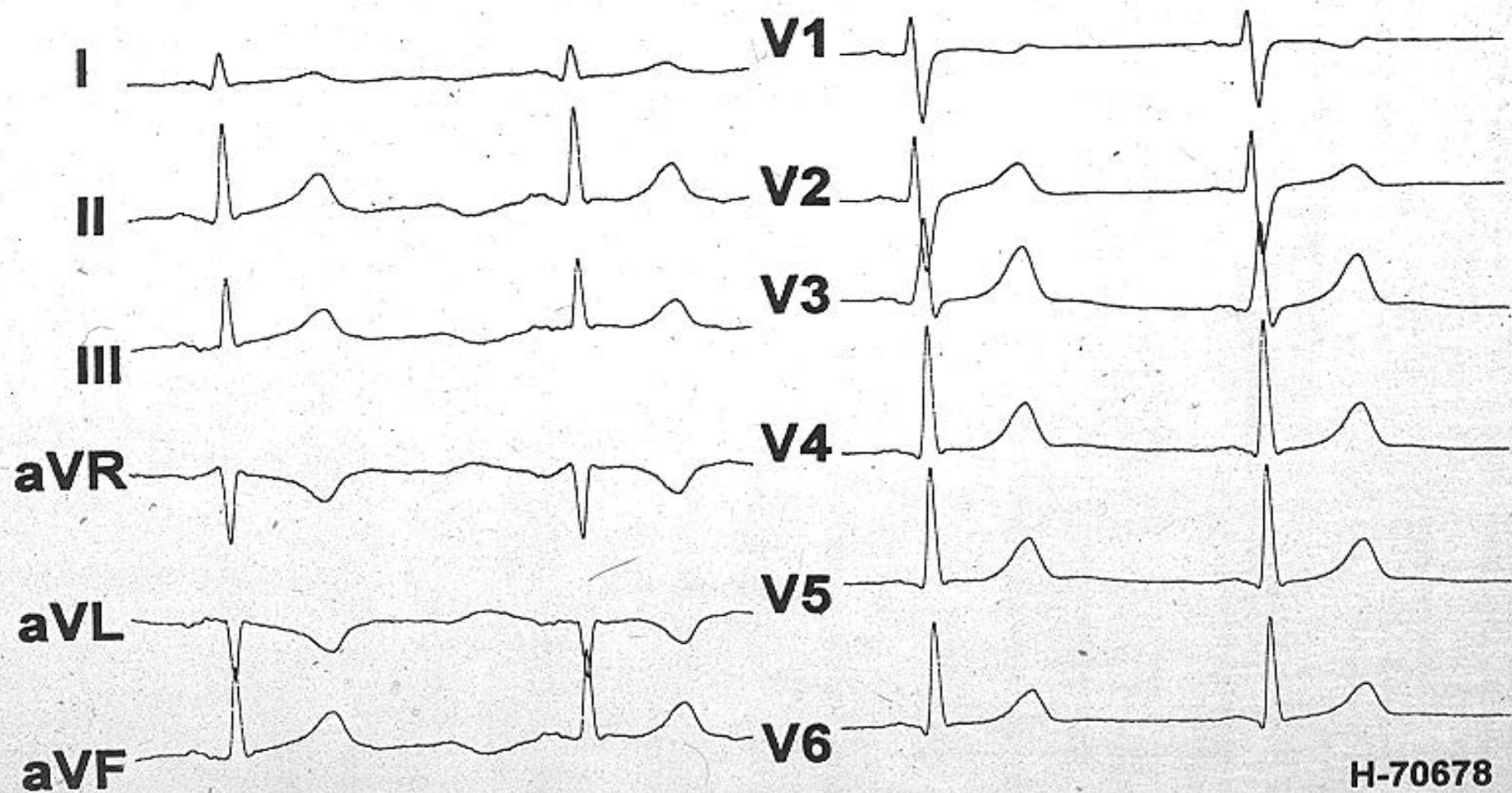
Exercise within 1 hour

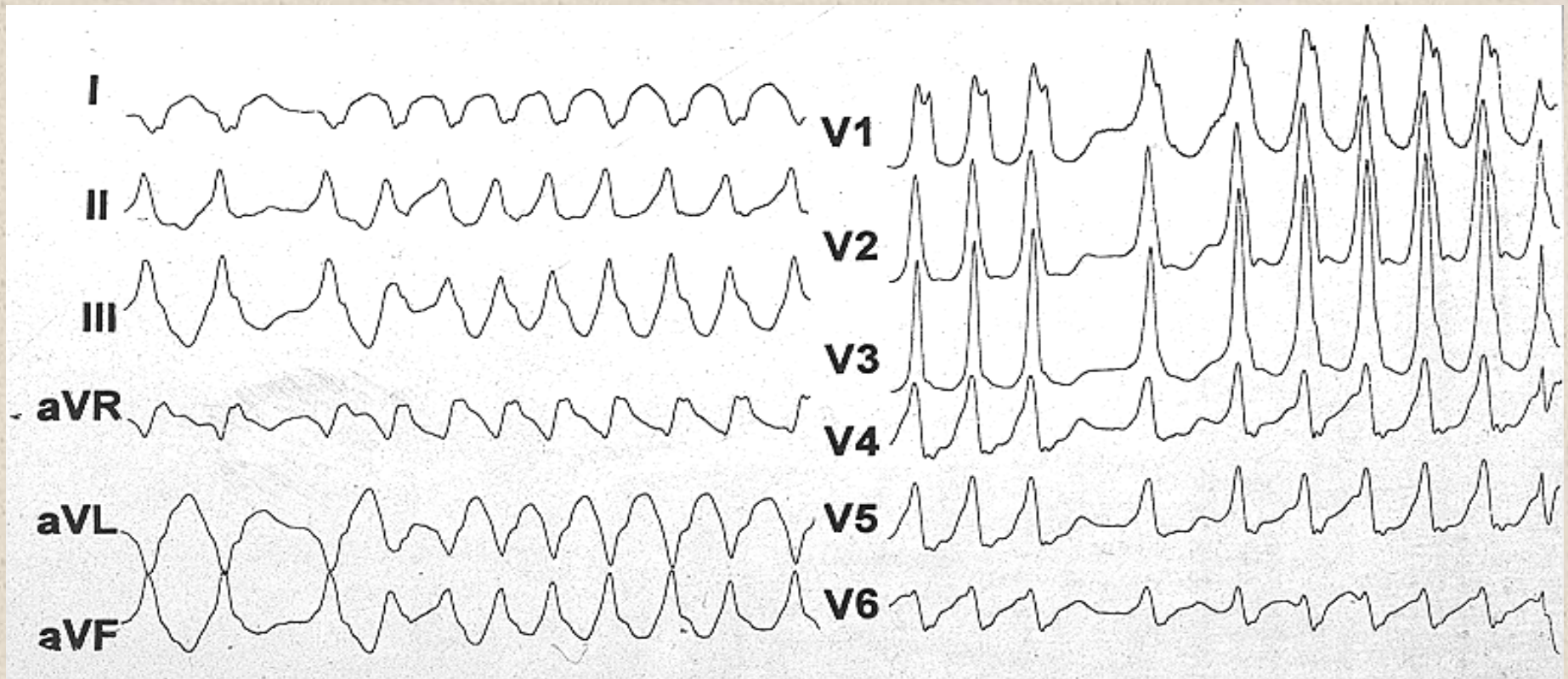


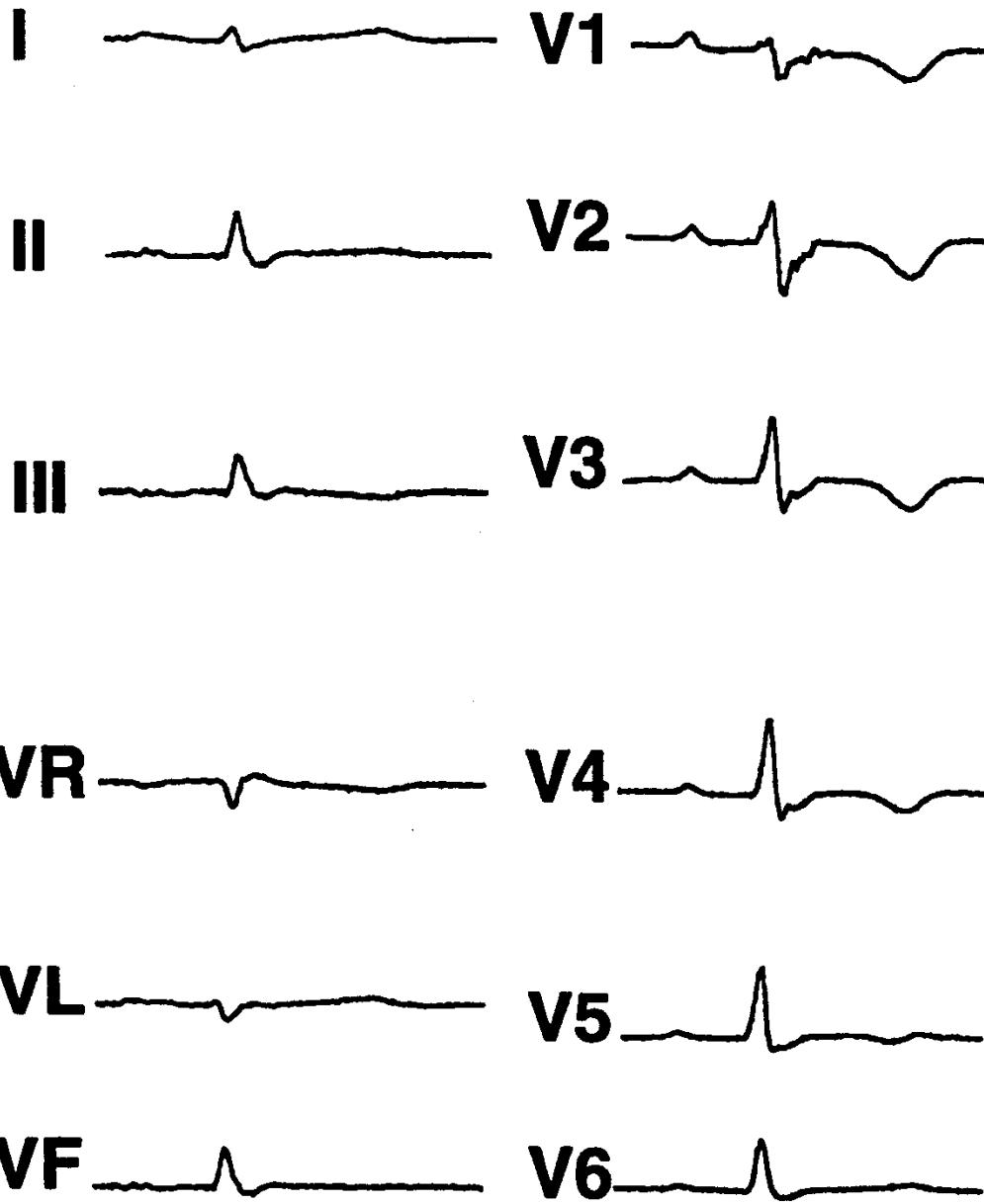
Non-Exercising



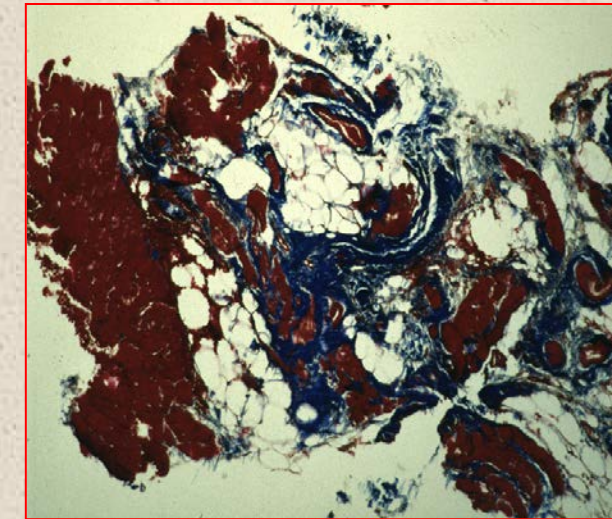
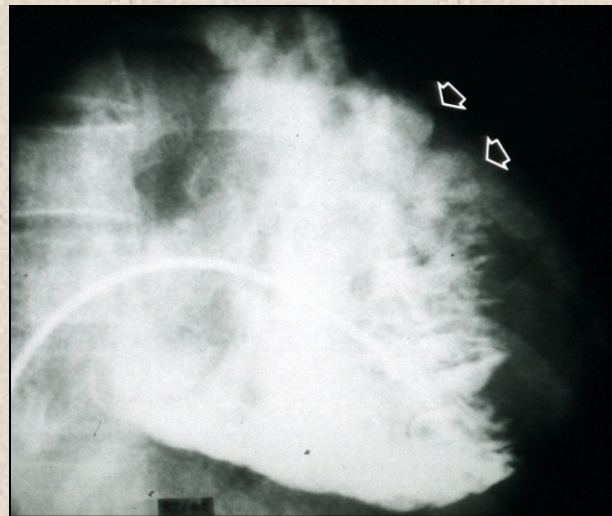
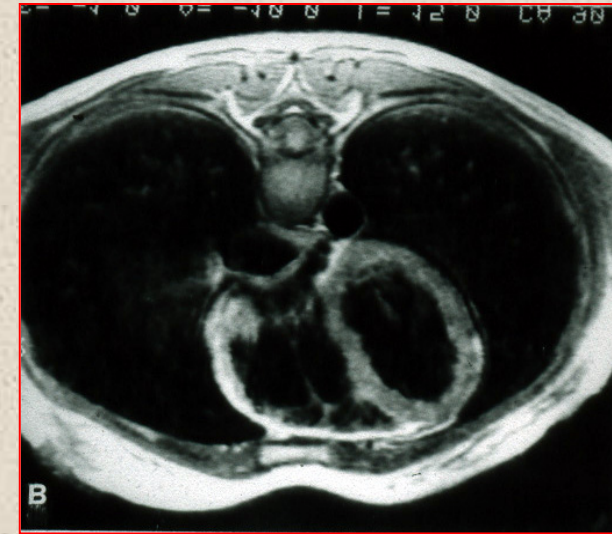
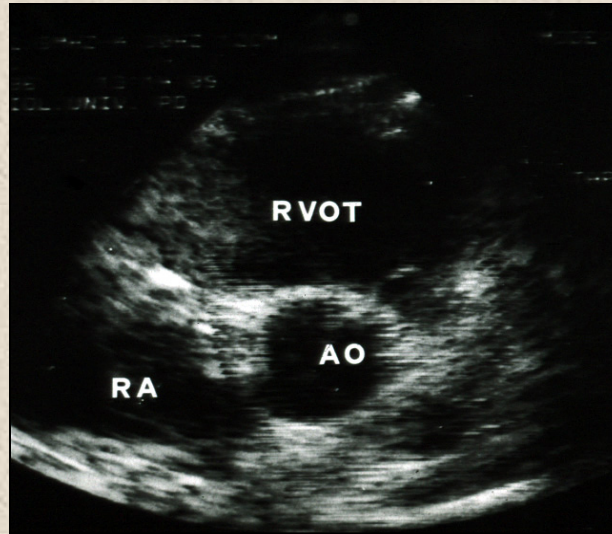
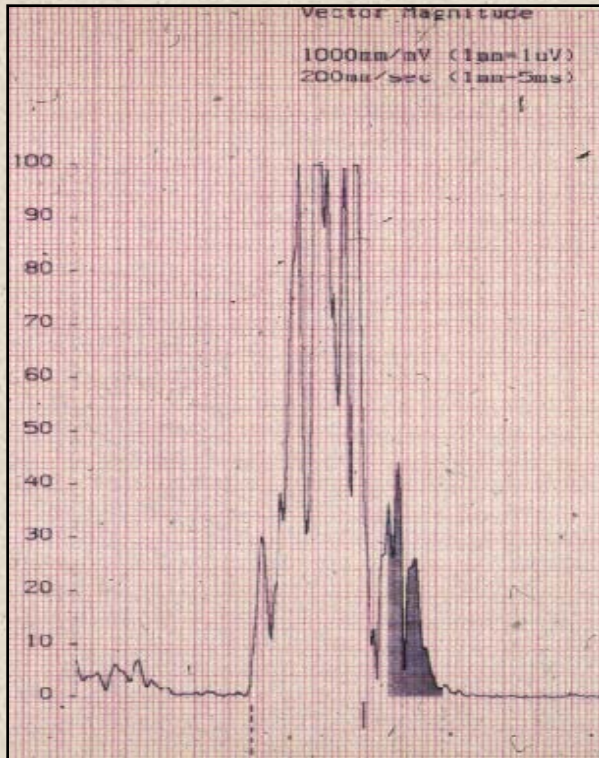
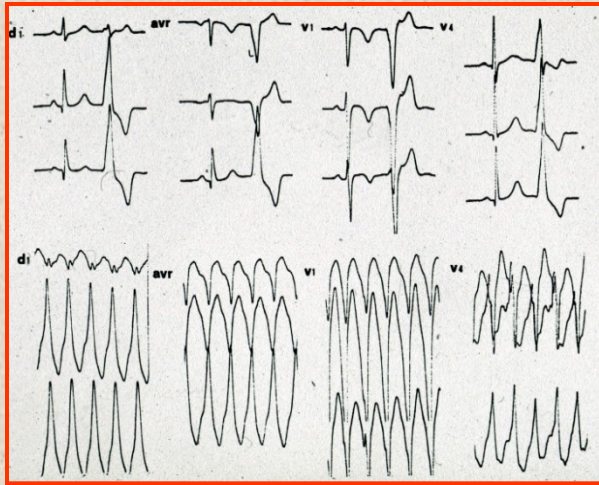
- **First manifestation of heart disease in
~ 50% of cases**
- **~ 60% of cardiac deaths are SCD**
- **~ 80% of SCD occur at home**







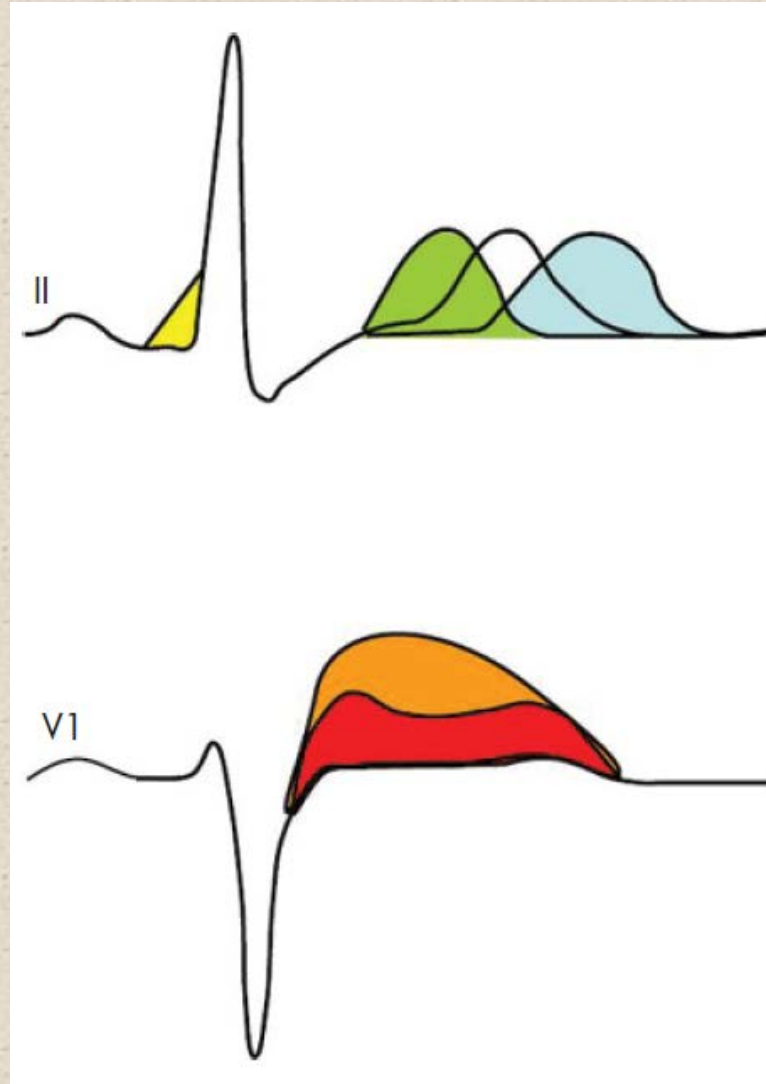
ARVD/C phenotype



"Arrhythmogenic right ventricular cardiomyopathy/dysplasia"
Thiene G, Nava A, Rossi L, eds. Elsevier, Amsterdam, 1997

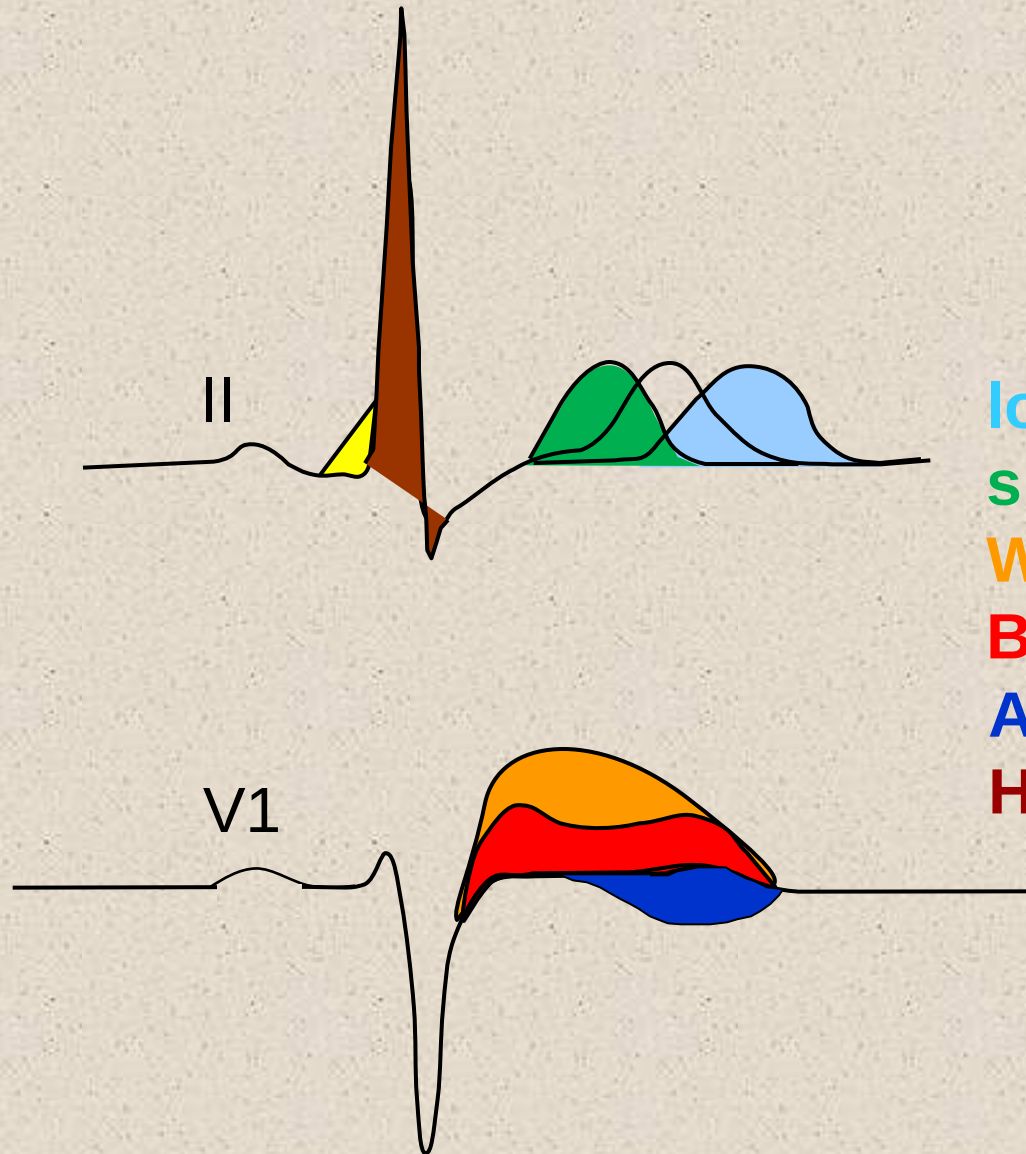


Primary prevention of sudden cardiac death

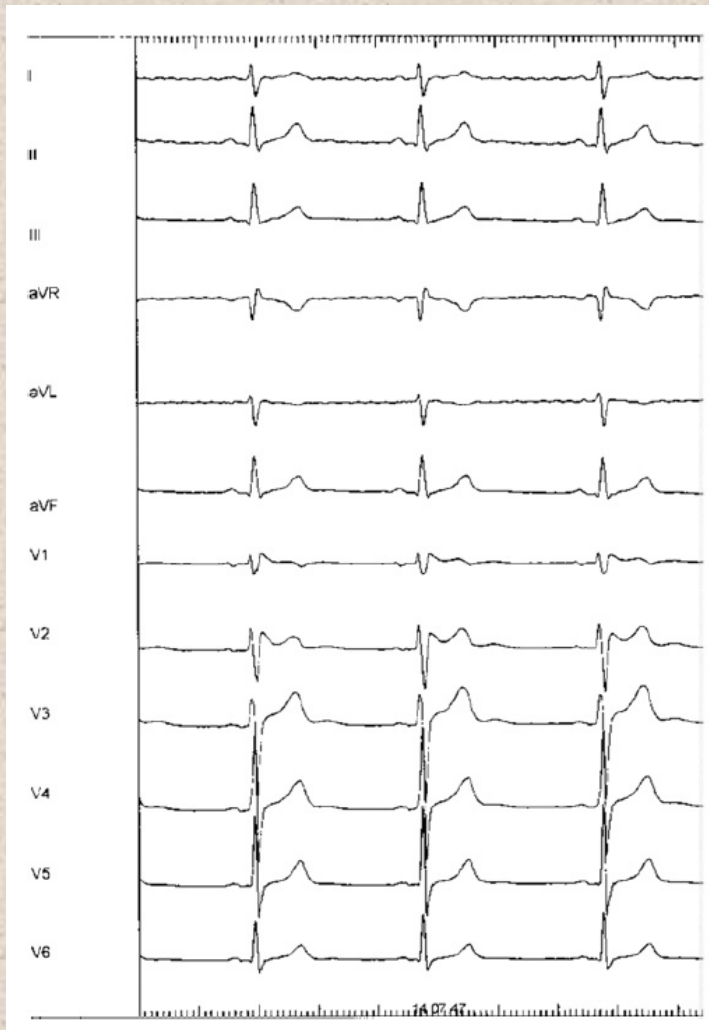


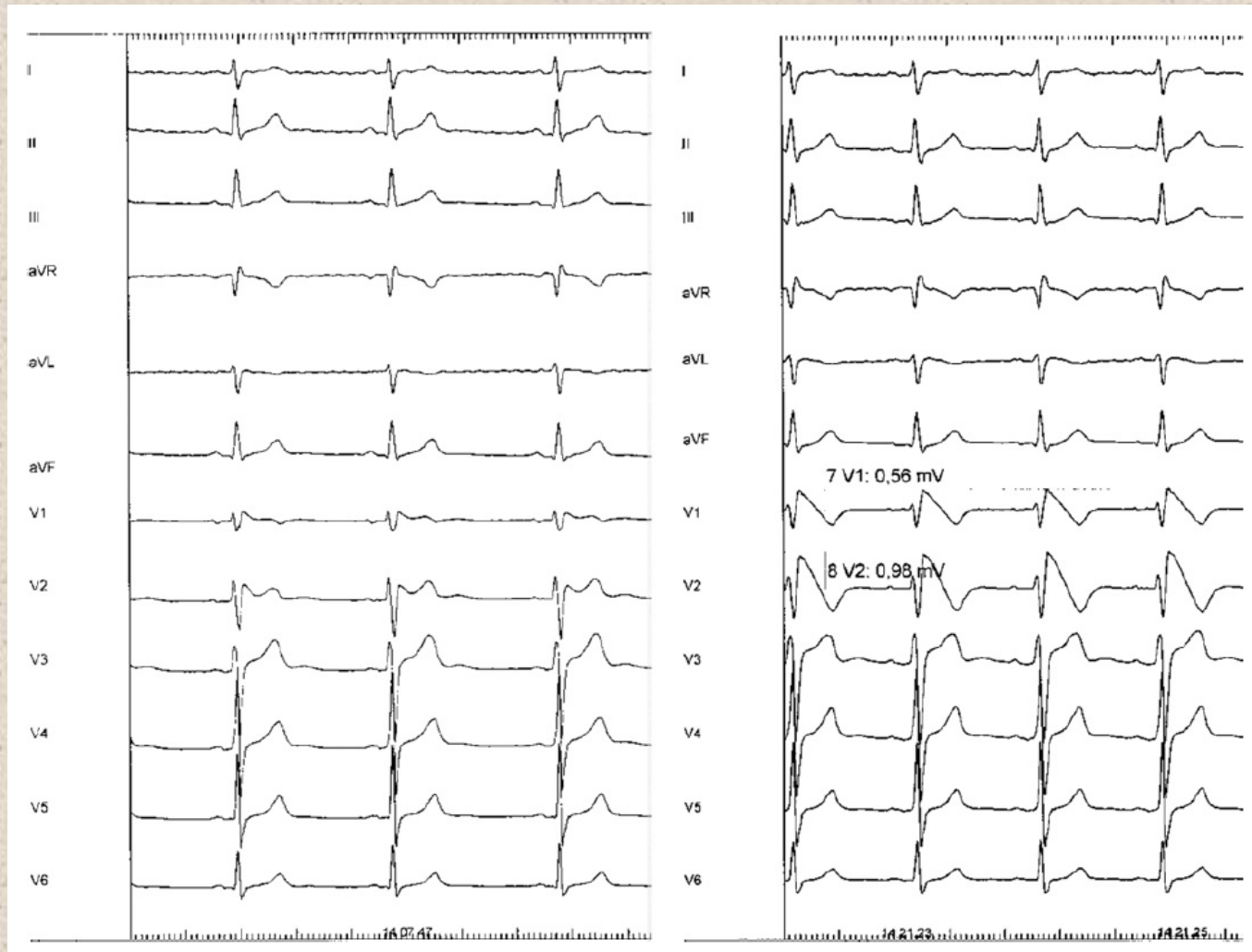
**ECG changes
associated with
“electrical” diseases**

Arrhythmogenic CM in the ECG



long QT Syndromes
short QT Syndromes
WPW Syndrome
Brugada Syndrome(s)
ARVC
HCM





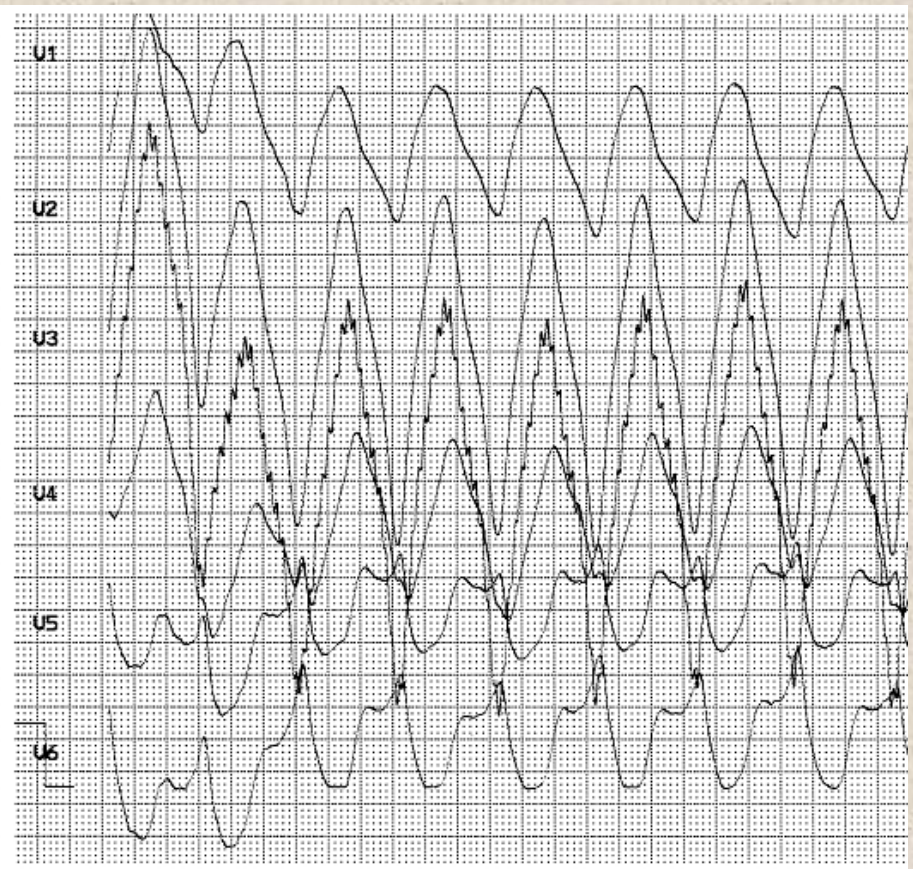
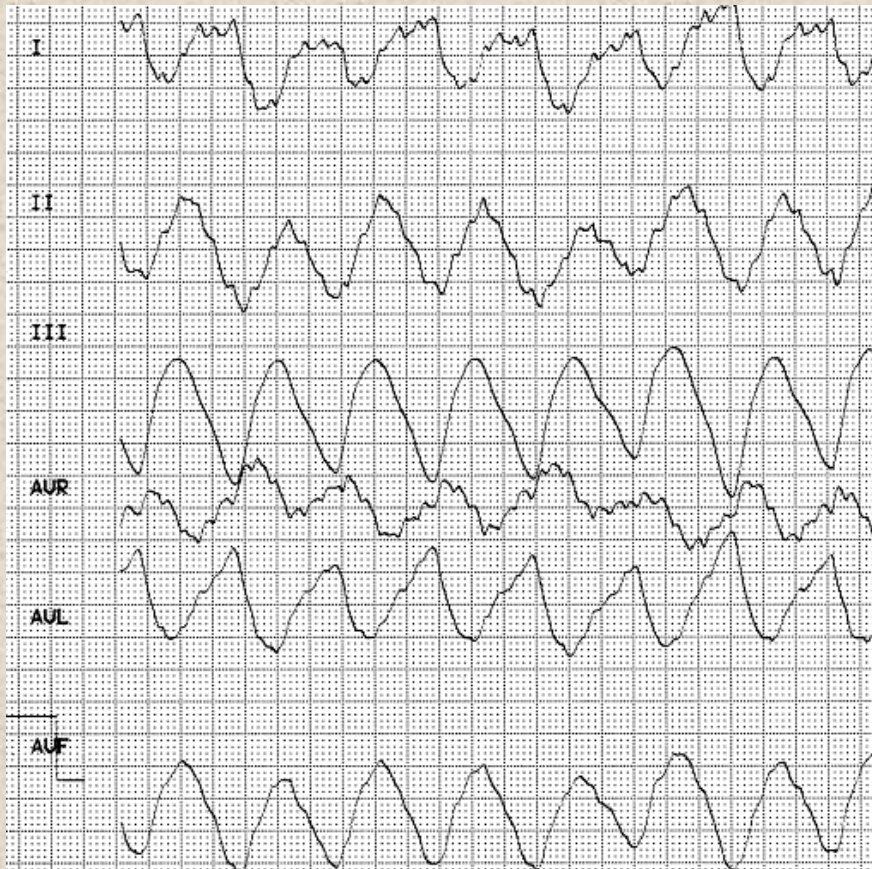
Brugada Syndrome

Yew intoxication (*Taxus baccata*)

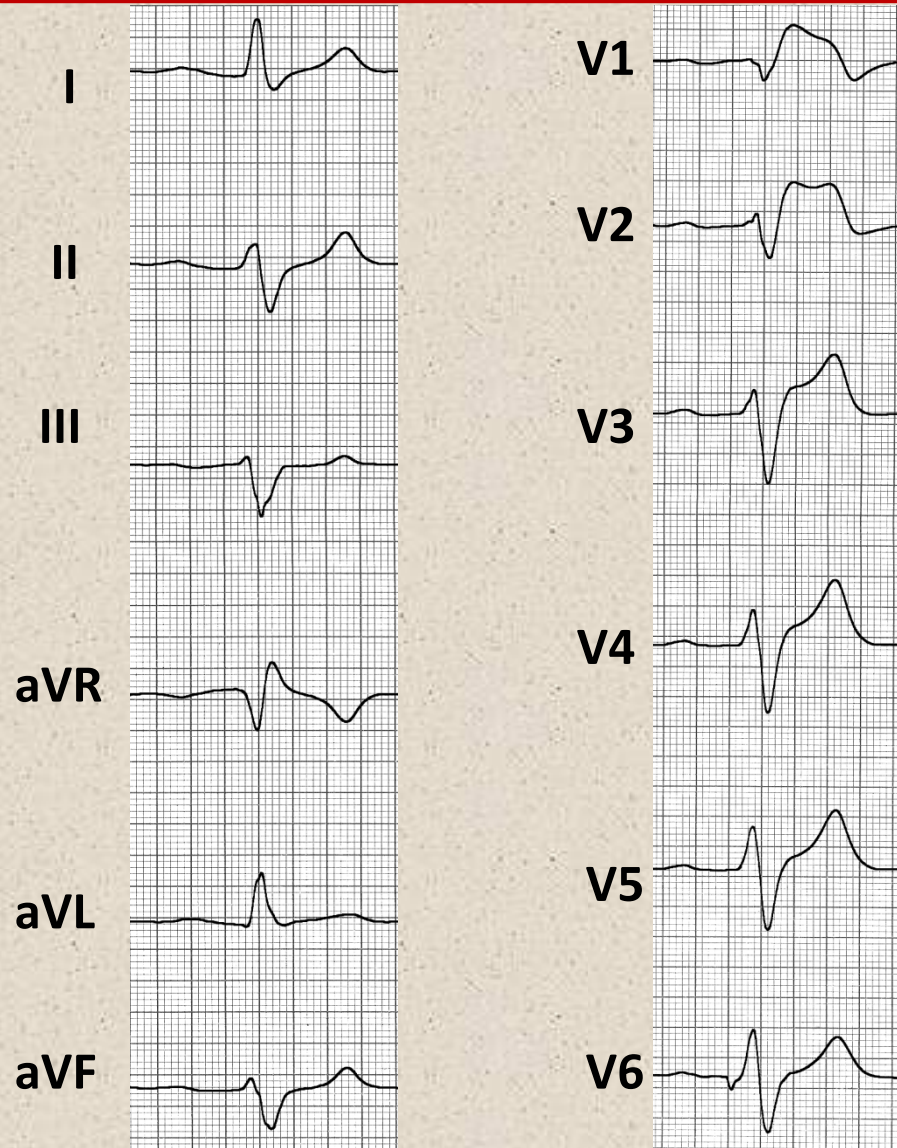


Brugada Syndrome

Yew intoxication (taxine A, B)



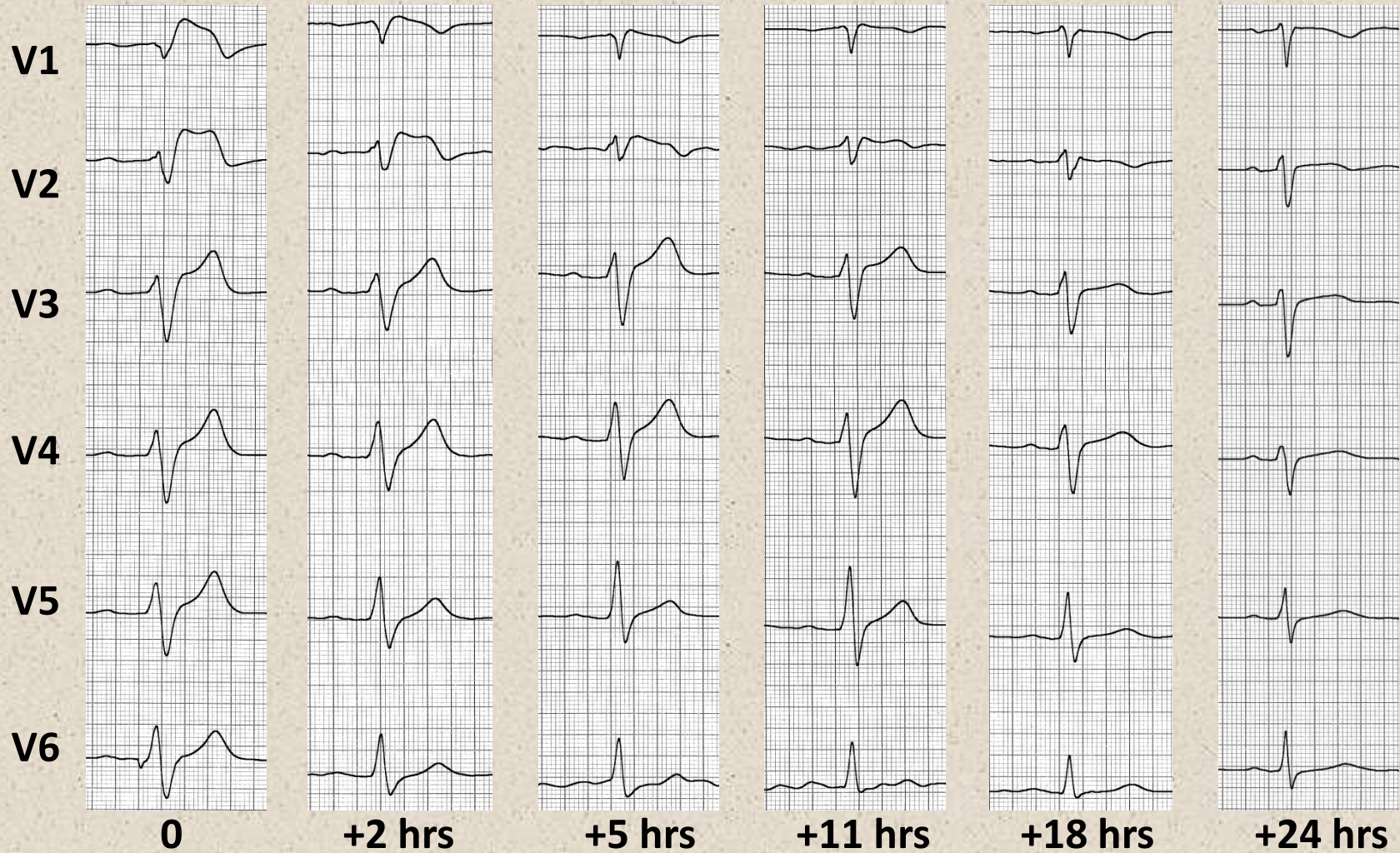
Brugada Syndrome



**Yew intoxication
(taxine A, B)**

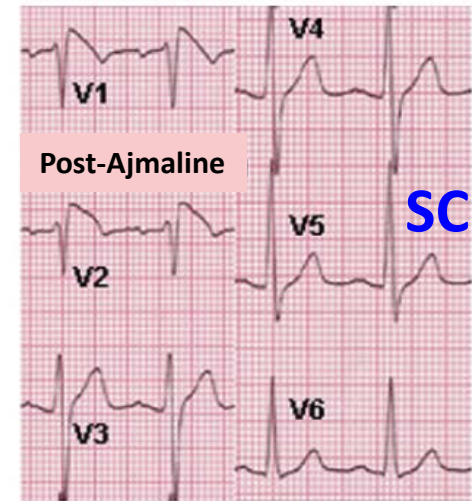
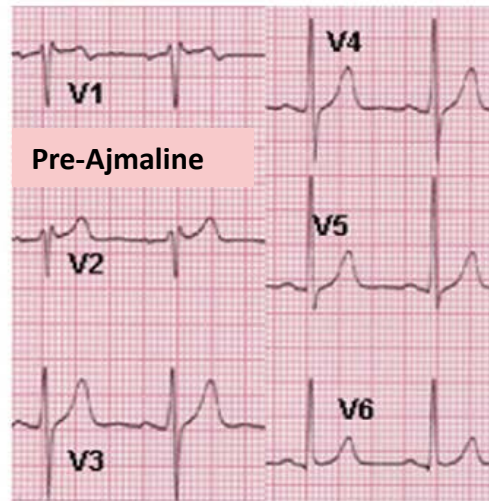
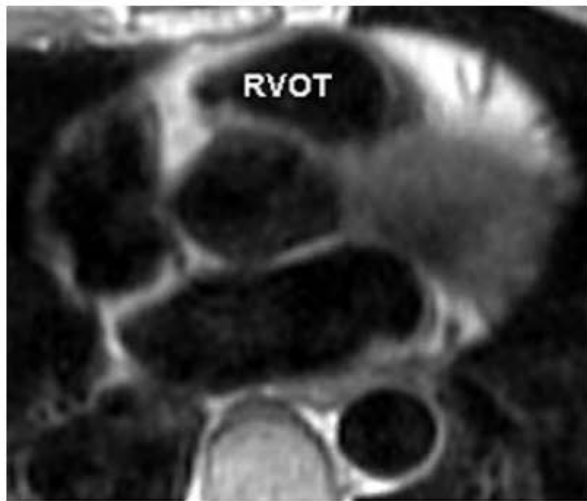
Brugada Syndrome

Yew Intoxication (taxine A, B)

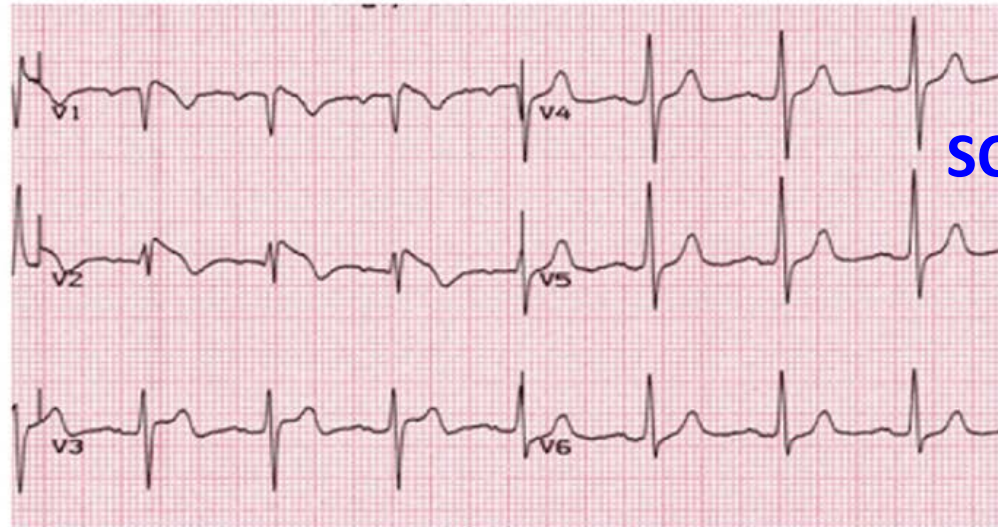
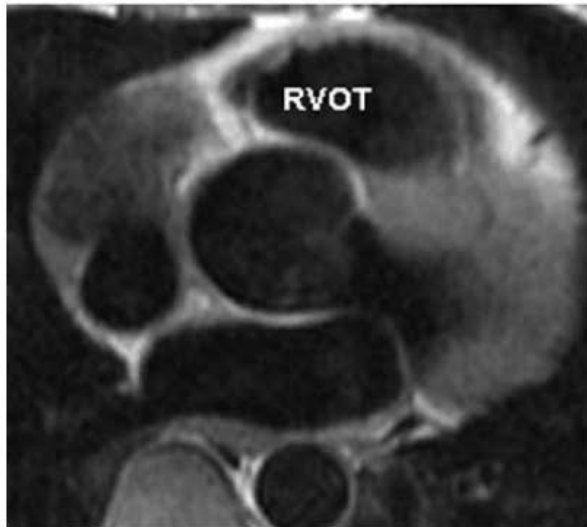


Cardiomyopathies and Arrhythmias

Brugada Syndrome

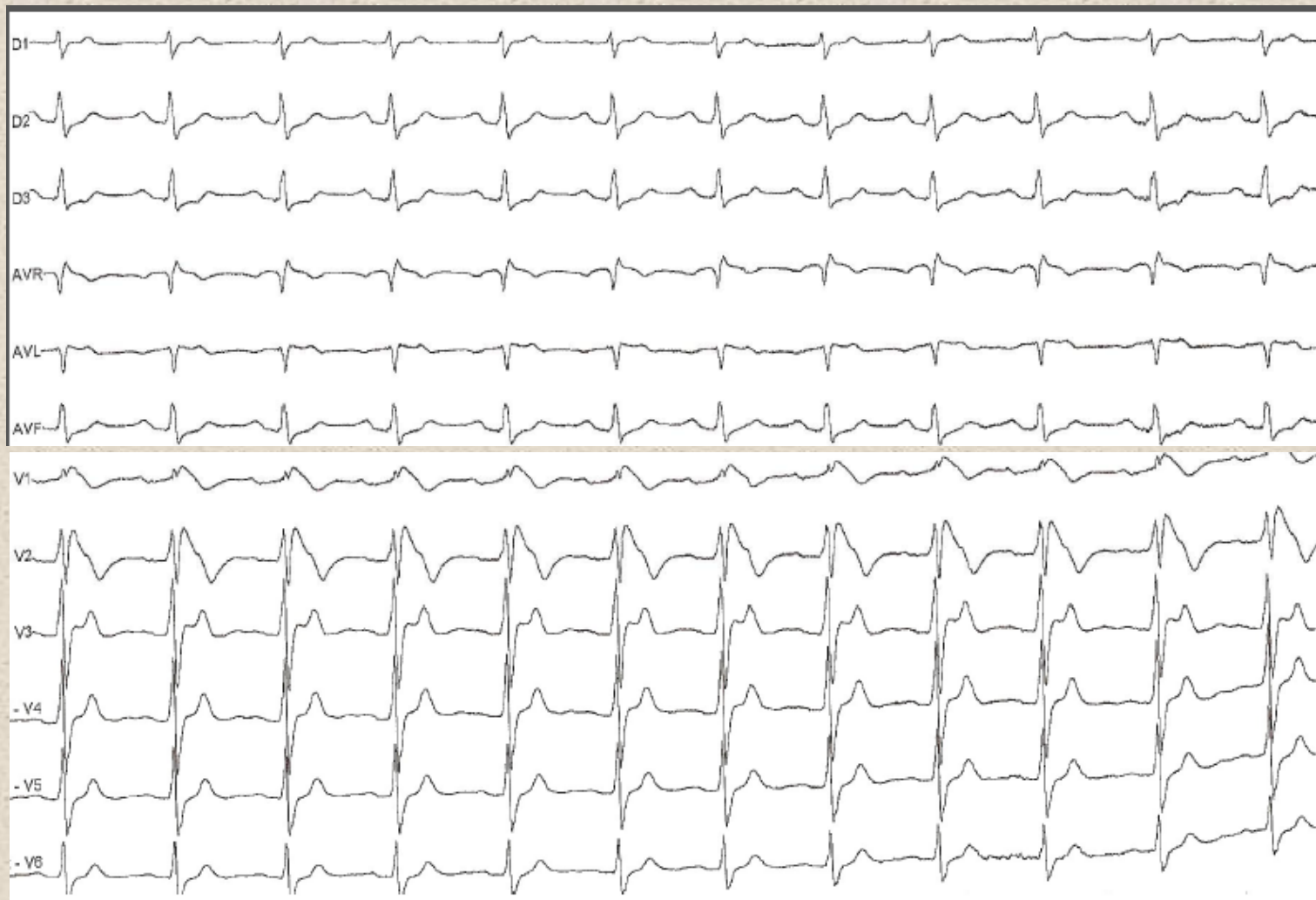


SCN5A 0

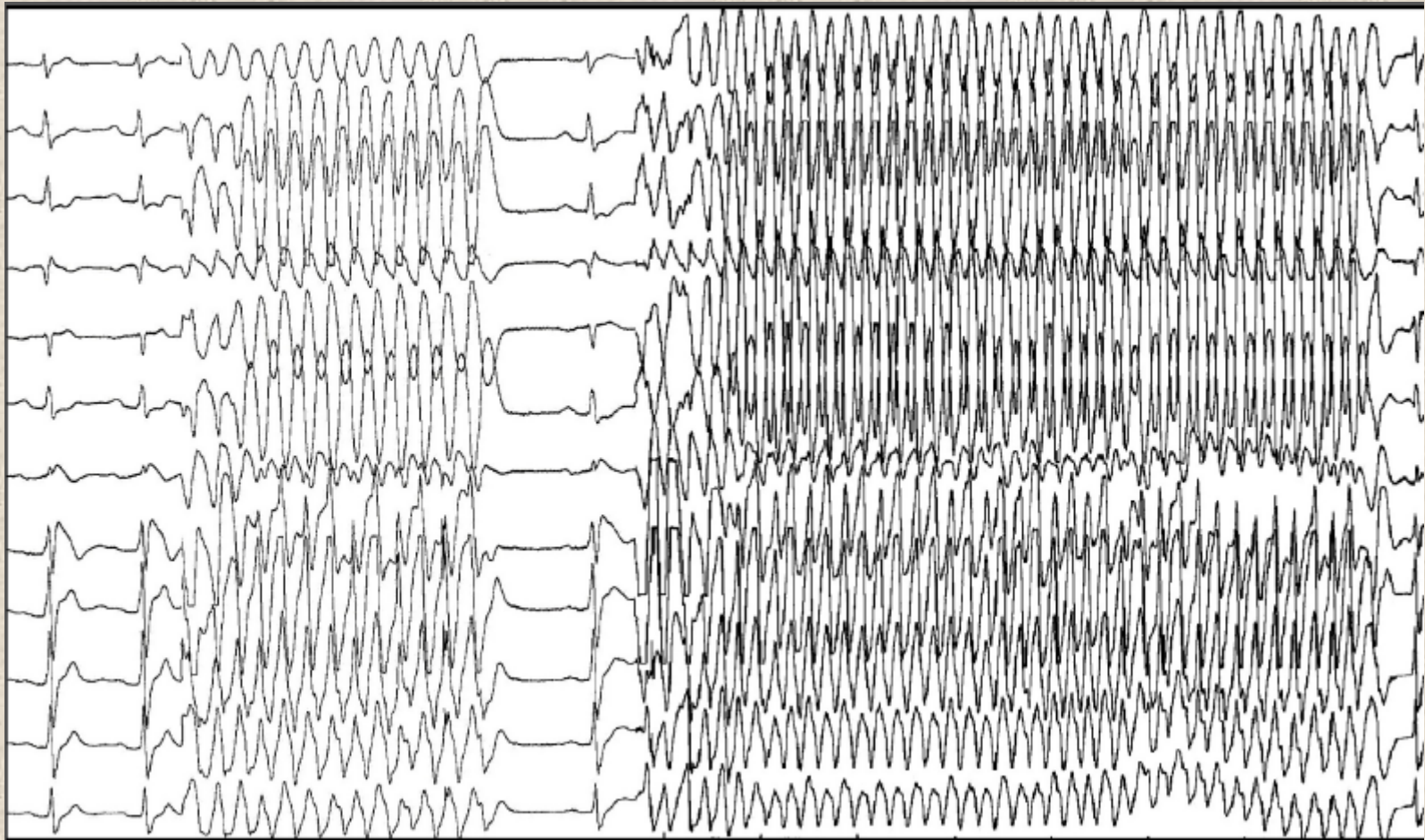


SCN5A +

Papavassiliu et al. Heart Rhythm 2010;7:1790 –1796



48 h ago (fever 39°)



Cardiac arrest

General aspects

- Hemodynamic stability
 - Neurological damage
 - Circumstances of arrest
 - Age
 - Underlying heart disease
 - Concomitant disease
 - Drug tx
-

Cardiac arrest

Prior ICD

Evaluate cardiac structure and function (Echo); evaluate ischemia (cath, noninvasive) if not recently performed; ECG

Treat prognostic disease
revascularize as indicated
medical therapy for heart function

Known SHD

Evaluate cardiac structure and function (Echo); evaluate ischemia (cath, noninvasive); ECG

Treat prognostic disease
revascularize as indicated
medical therapy for heart function
ICD if indicated

No Known SHD

Evaluate cardiac structure and function (Echo, ECG); evaluate ischemia (cath, noninvasive); ECG

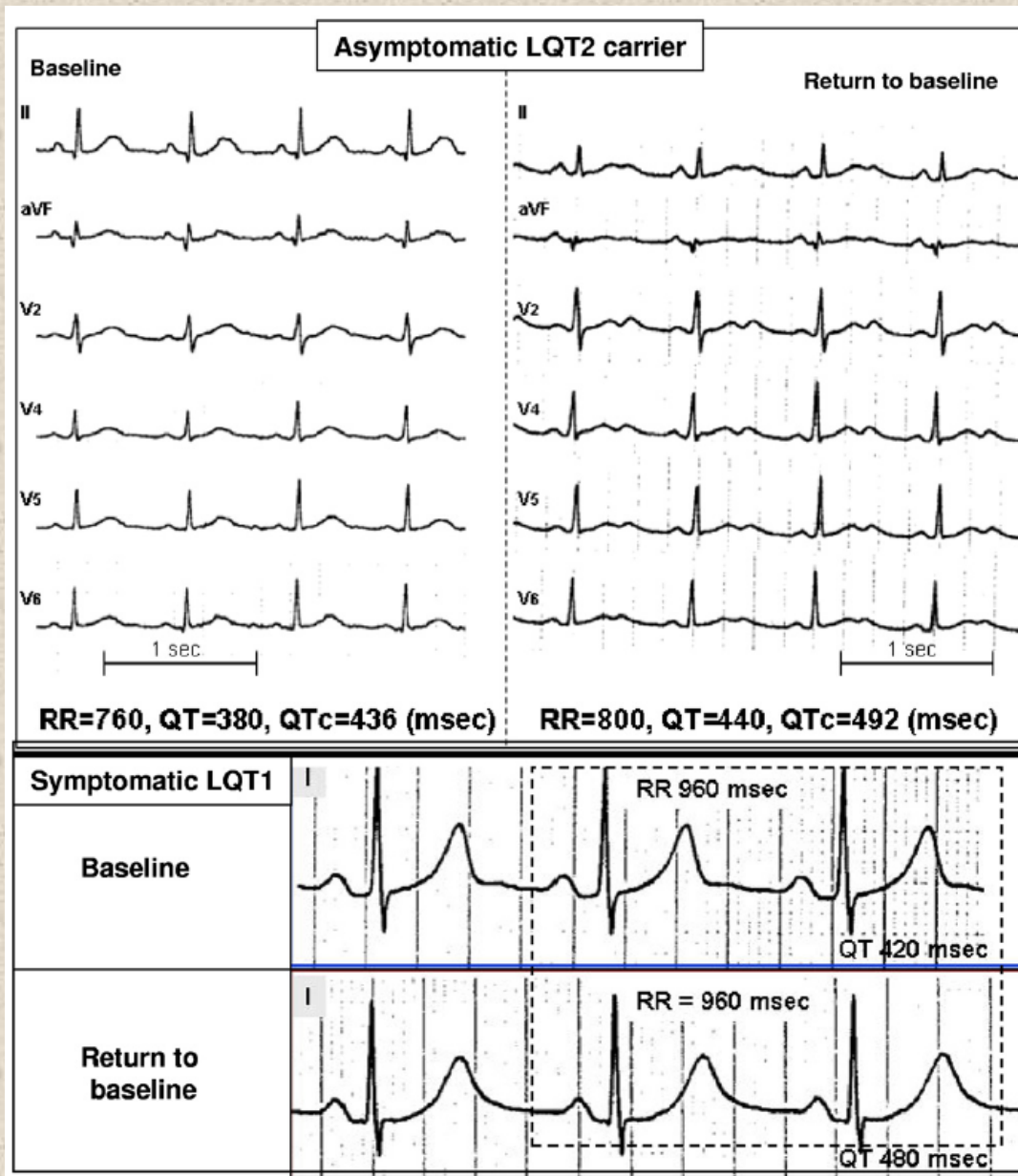
-

Exclude myocardial scar,
cMRI, saECG, PET, as
indicated

+

Cardiac arrest

- ECG
 - Echo
 - Exercise test
 - Ischemia
 - CPVT
 - Coronary angiography (anomalies)
-
- MRI (cardiac tumor; scar)
 - Ajmaline challenge
 - QT stretch



Adler et al. Heart Rhythm 2012; 9: 901-908

Conclusion (I)

- **Rule out structural heart disease**
- **Consider coronary angiography, even in the young**
- **Baseline and repeat ECG's may identify primary electrical diseases**

Conclusion (II)

- **Specific tests (ajmaline, QT stretch, adenosine, EP-study) have to be considered on an individual basis.**
- **Identify possible transient causes (QT prolonging drugs, cocaine etc.)**