



ECG Related with Sudden Cardiac Death



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COI Disclosure

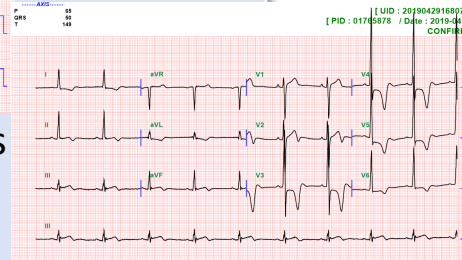
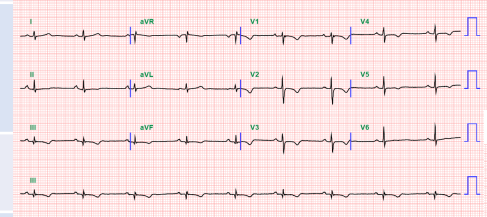
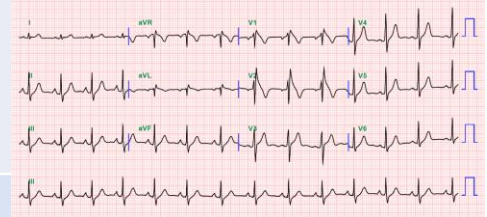
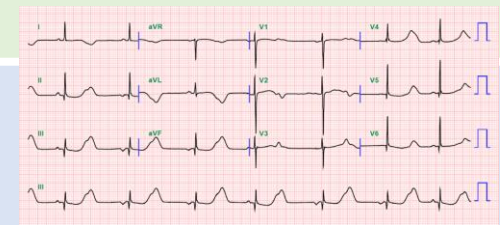
Name of First Author:

The authors have no financial conflicts of interest to disclose concerning the presentation



ECG abnormalities in the inherited arrhythmia

Syndrome	ECG features
Long QT syndrome	<p>QTc \geq 500ms in the absence of other causes</p> <p>LQT2 – notched/bifid T wave</p> <p>LQT3 – long isoelectric ST segment</p>
Brugada syndrome	<p>Right bundle branch block and ST elevation in right precordial leads</p> <p>Type I – coved ST elevation \geq 2mm</p> <p>Types II and III – saddleback pattern</p>
Catecholaminergic polymorphic VT	Classic bidirectional VT during exercise
Short QT syndrome	QTc \leq 330ms or QTc $<$ 360ms with genetic mutation, aborted SCD or family history
Arrhythmogenic right ventricular cardiomyopathy	<p>T wave inversion in right precordial leads</p> <p>Epsilon wave</p>
Hypertrophic cardiomyopathy	ECG-LVH; ST-T wave abnormalities
Early repolarization syndrome	<p>J-point elevation \geq 1mm in \geq2 contiguous inferior and/or lateral leads</p> <p>‘Benign’ pattern: ascending ST segment</p> <p>‘Malignant’ pattern: horizontal/descending ST segment</p>



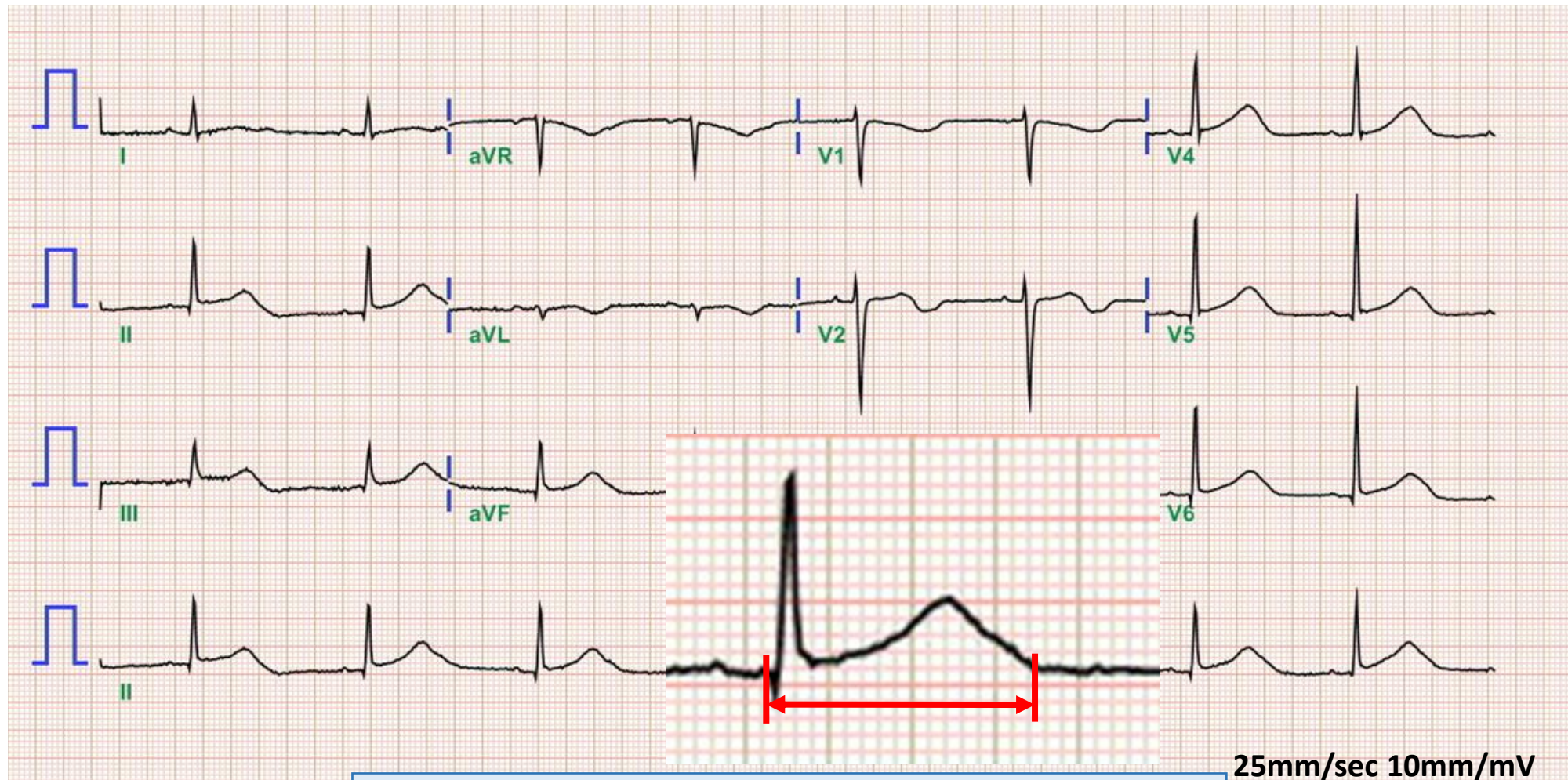
Agenda

- Long QT syndrome
- Brugada syndrome
- Arrhythmogenic right ventricular cardiomyopathy
- Hypertrophic cardiomyopathy



19 year-old female patient

Agonal respiration and cyanosis during sleeping

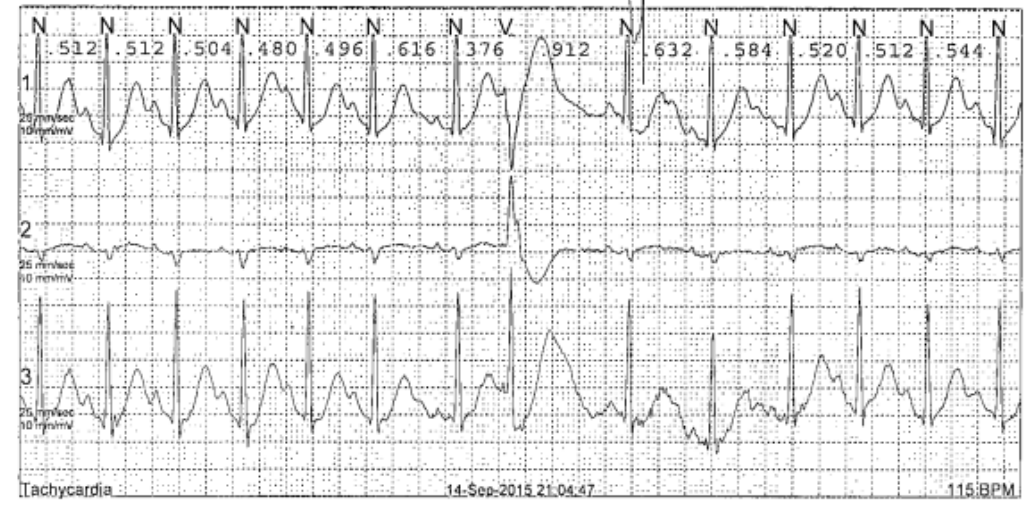
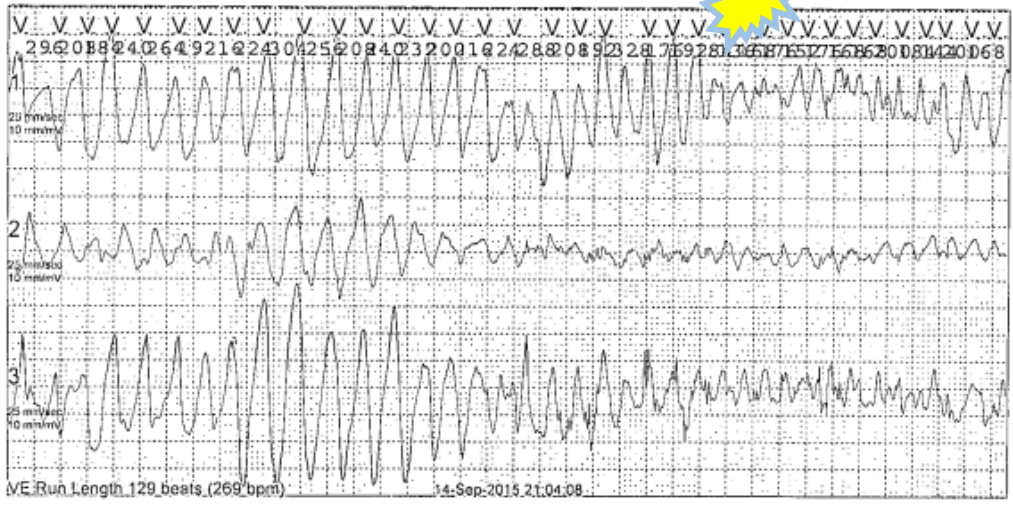
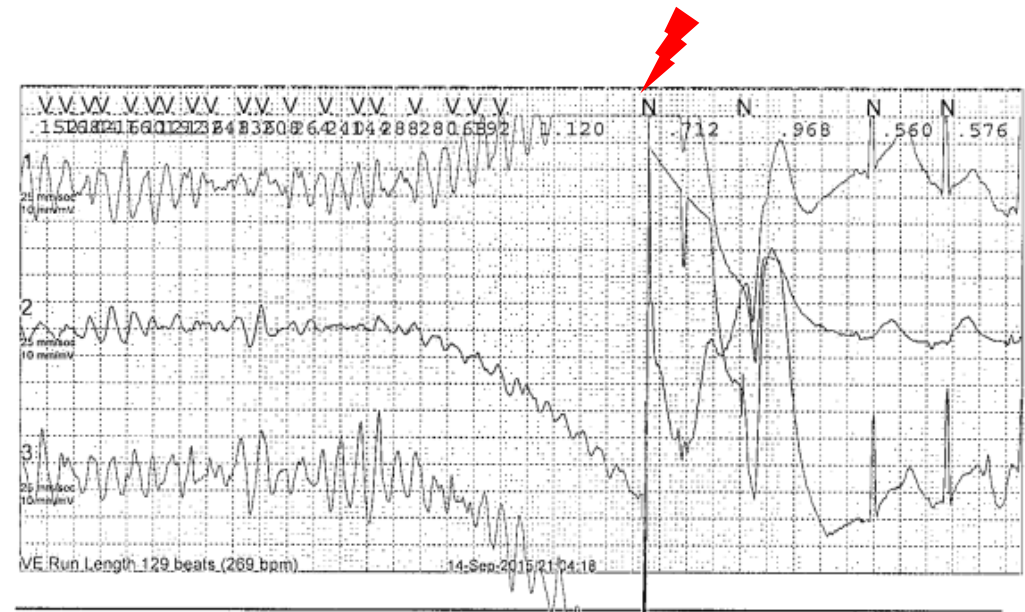
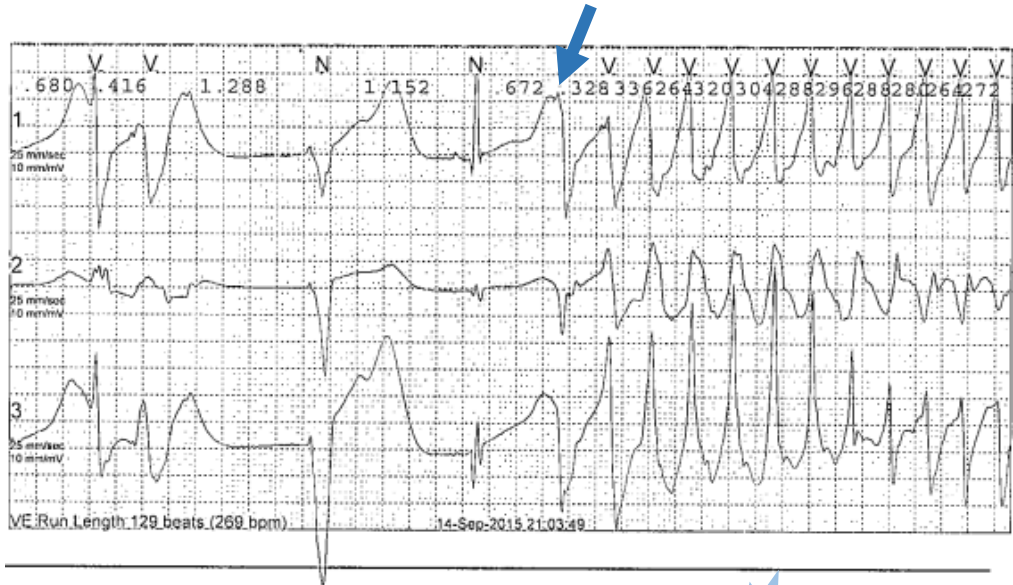


25mm/sec 10mm/mV

HR 51 bpm QT 596 ms QTc 550 ms

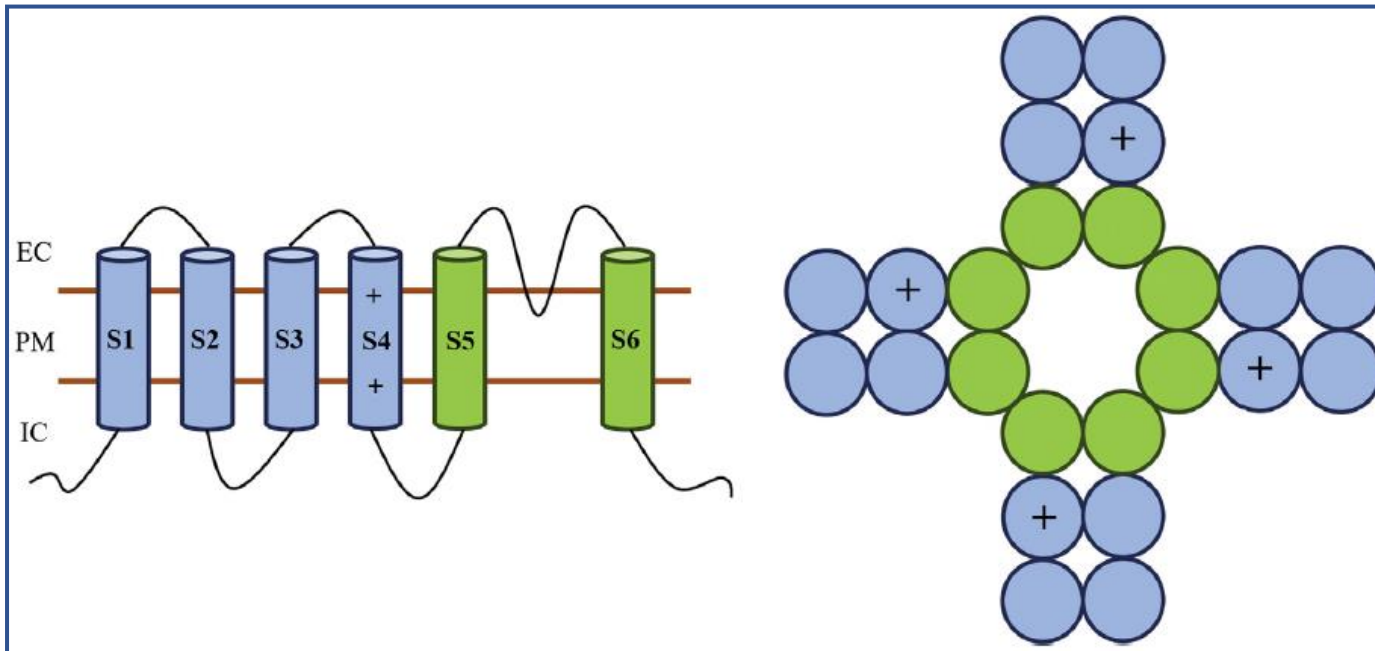


SCA during sleep in CCU

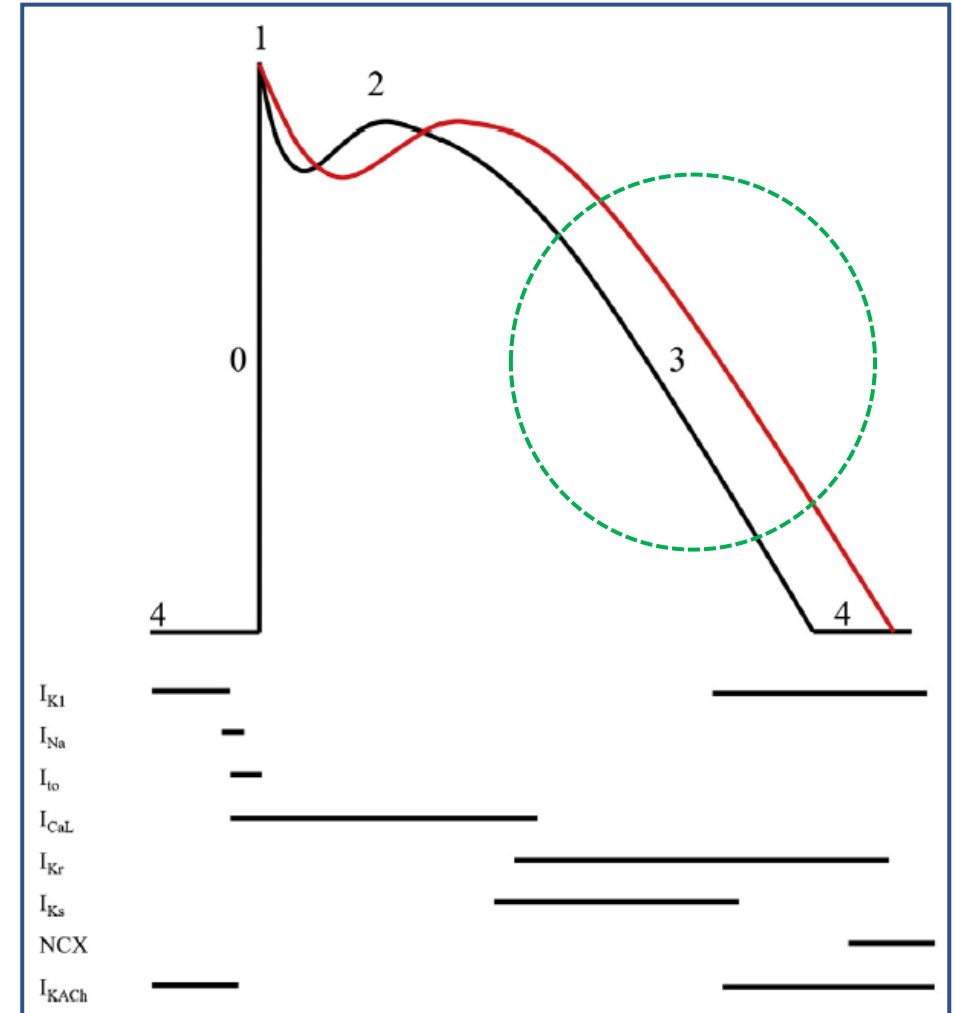


Pathophysiology

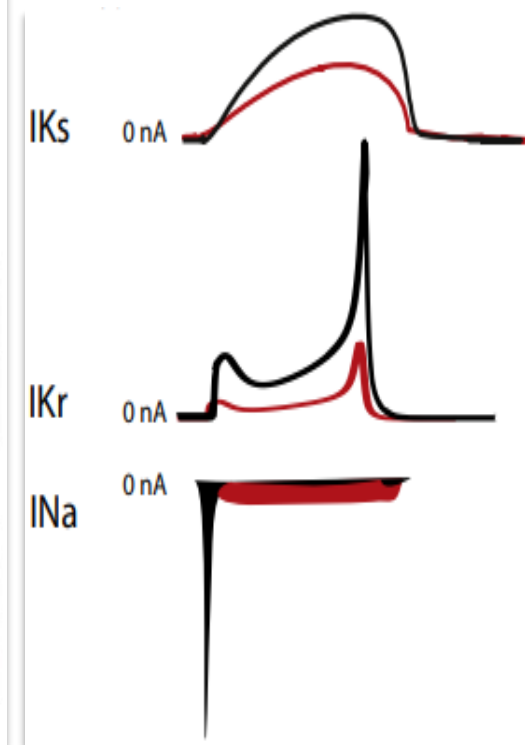
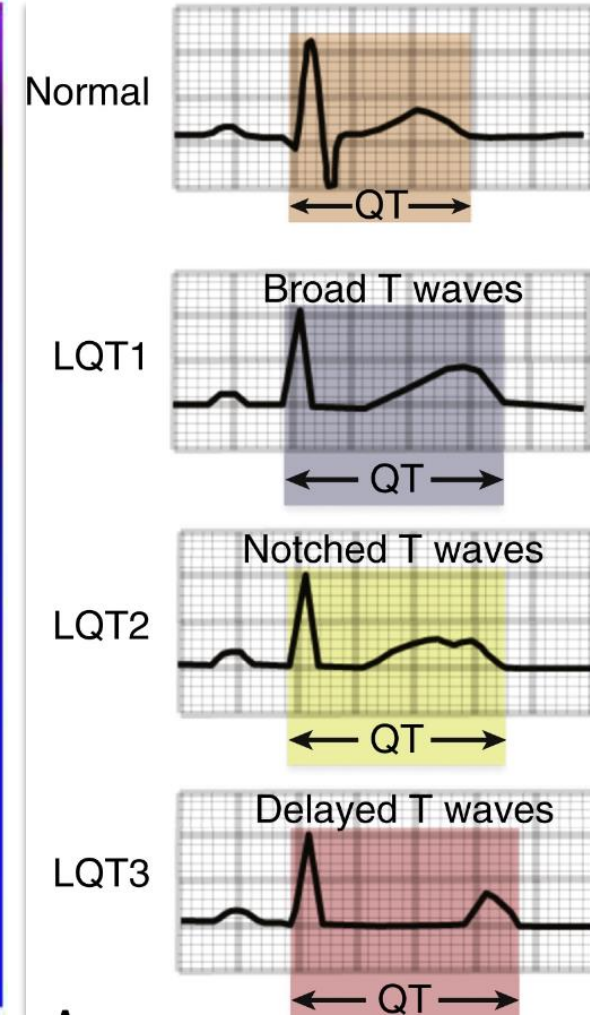
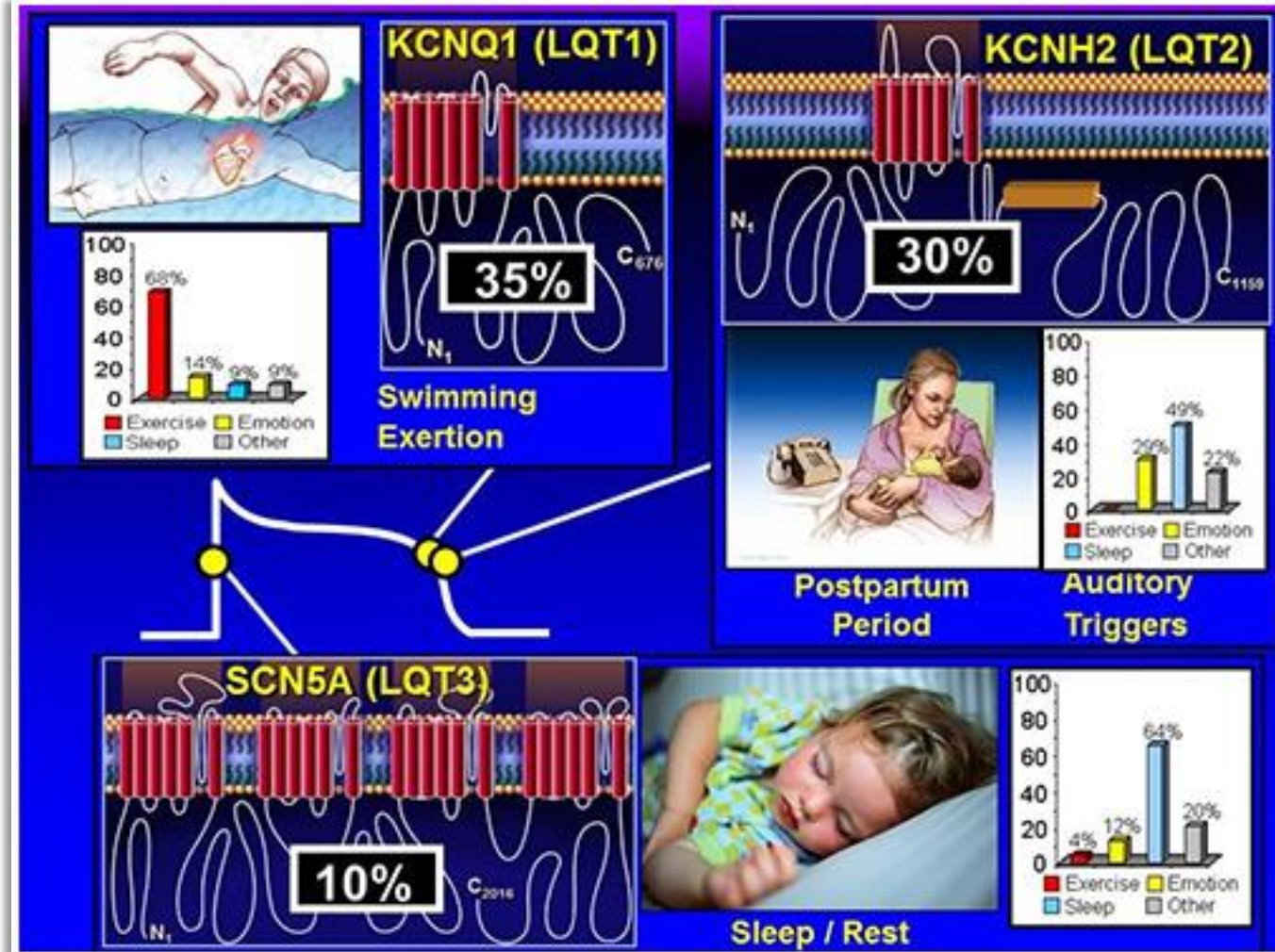
Voltage-Gated Potassium channel



Action Potential



Genotype-phenotype correlation

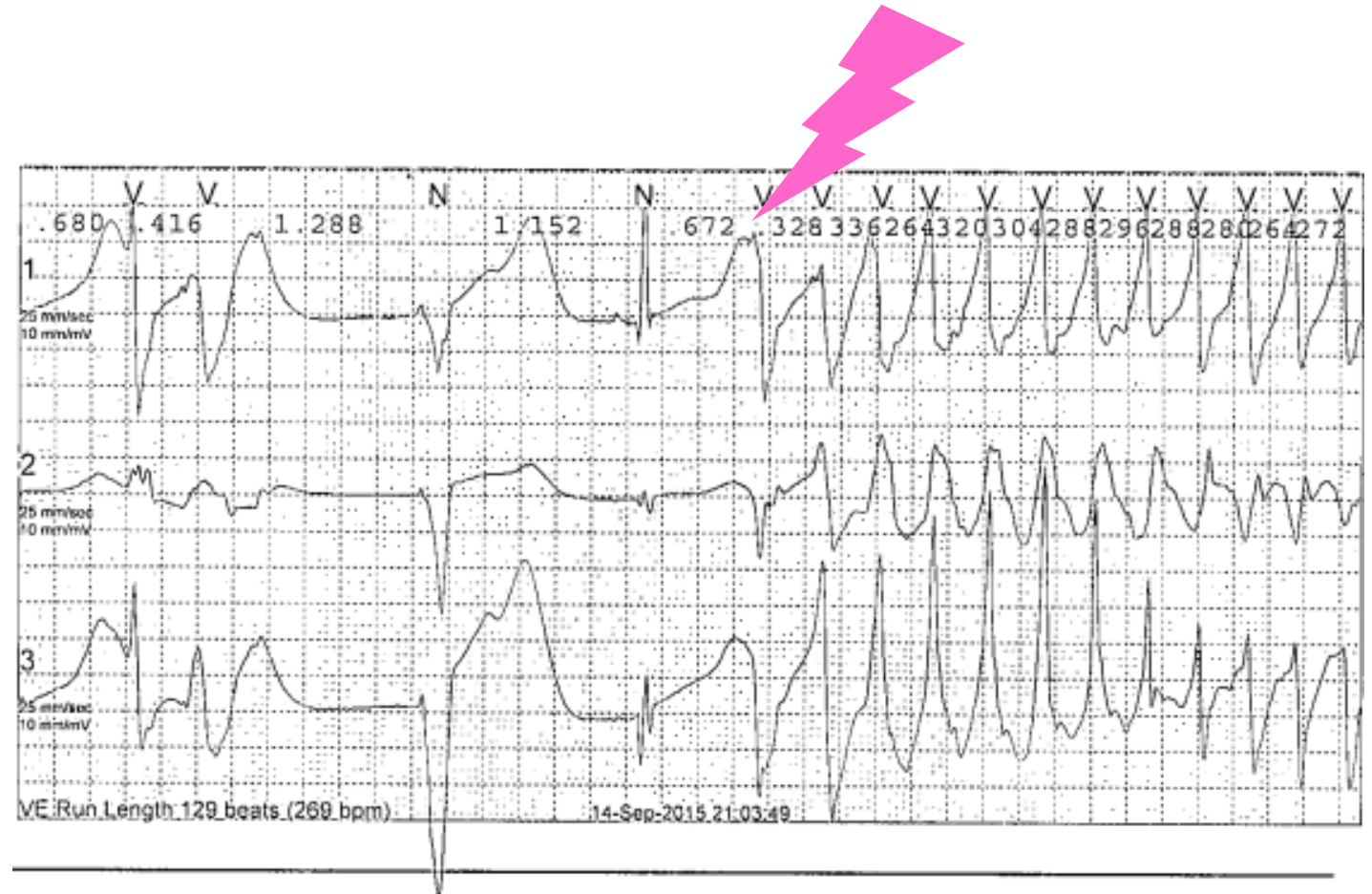
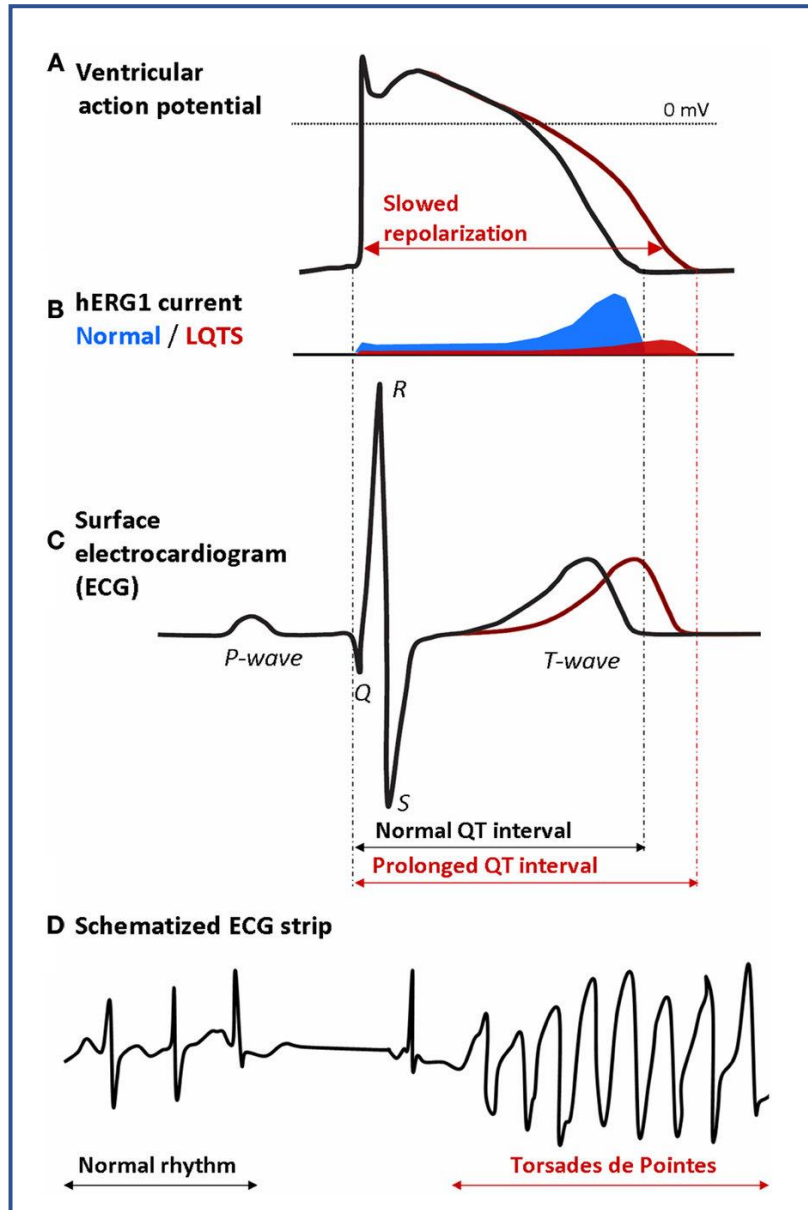


72 year-old female patient

KCNQ1 (+), recurrent syncope

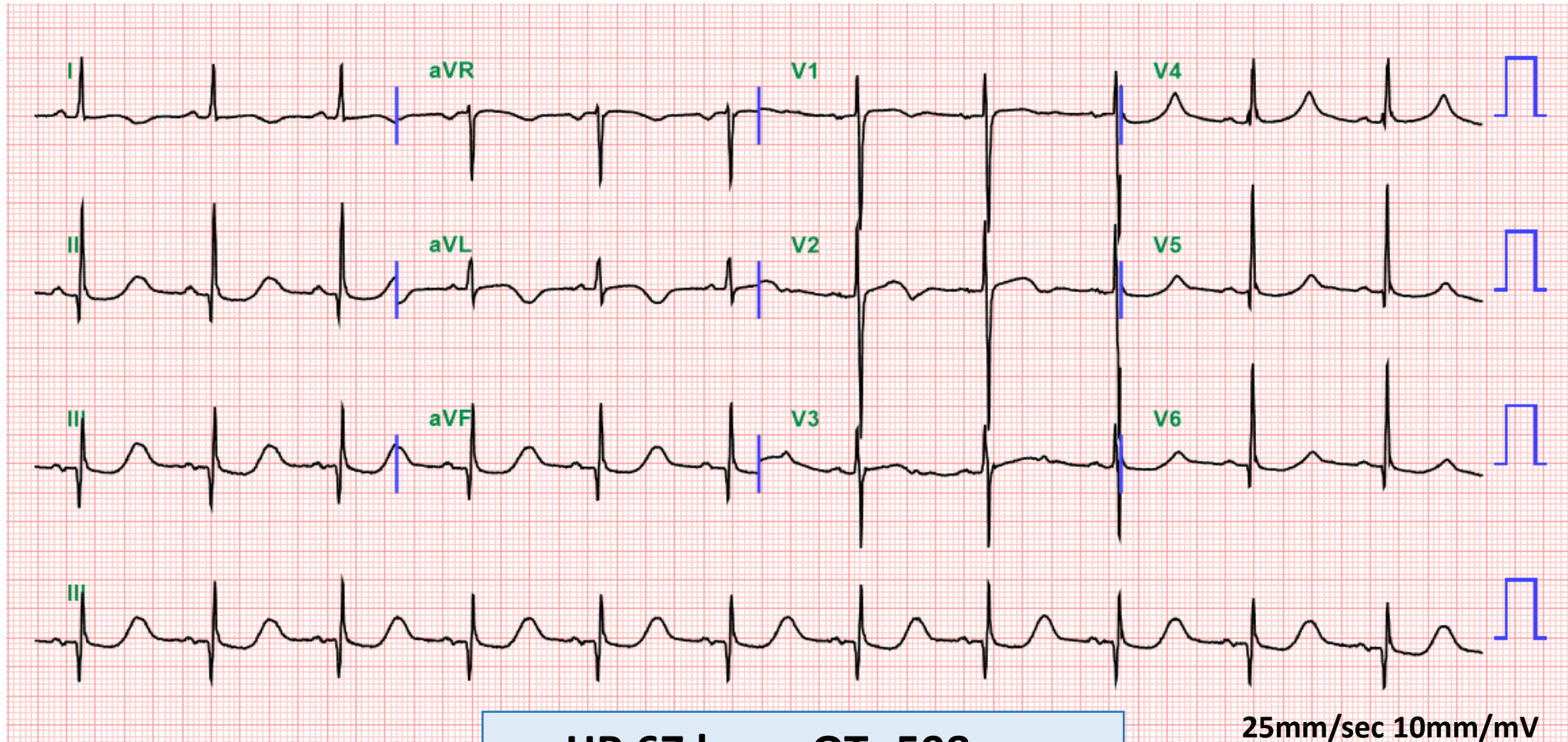


Mechanism of VT



40 year-old female patient

QT prolongation in health check up



HR 67 bpm QTc 598 ms

25mm/sec 10mm/mV



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- **Brugada syndrome**
- Arrhythmogenic right ventricular cardiomyopathy
- Hypertrophic cardiomyopathy

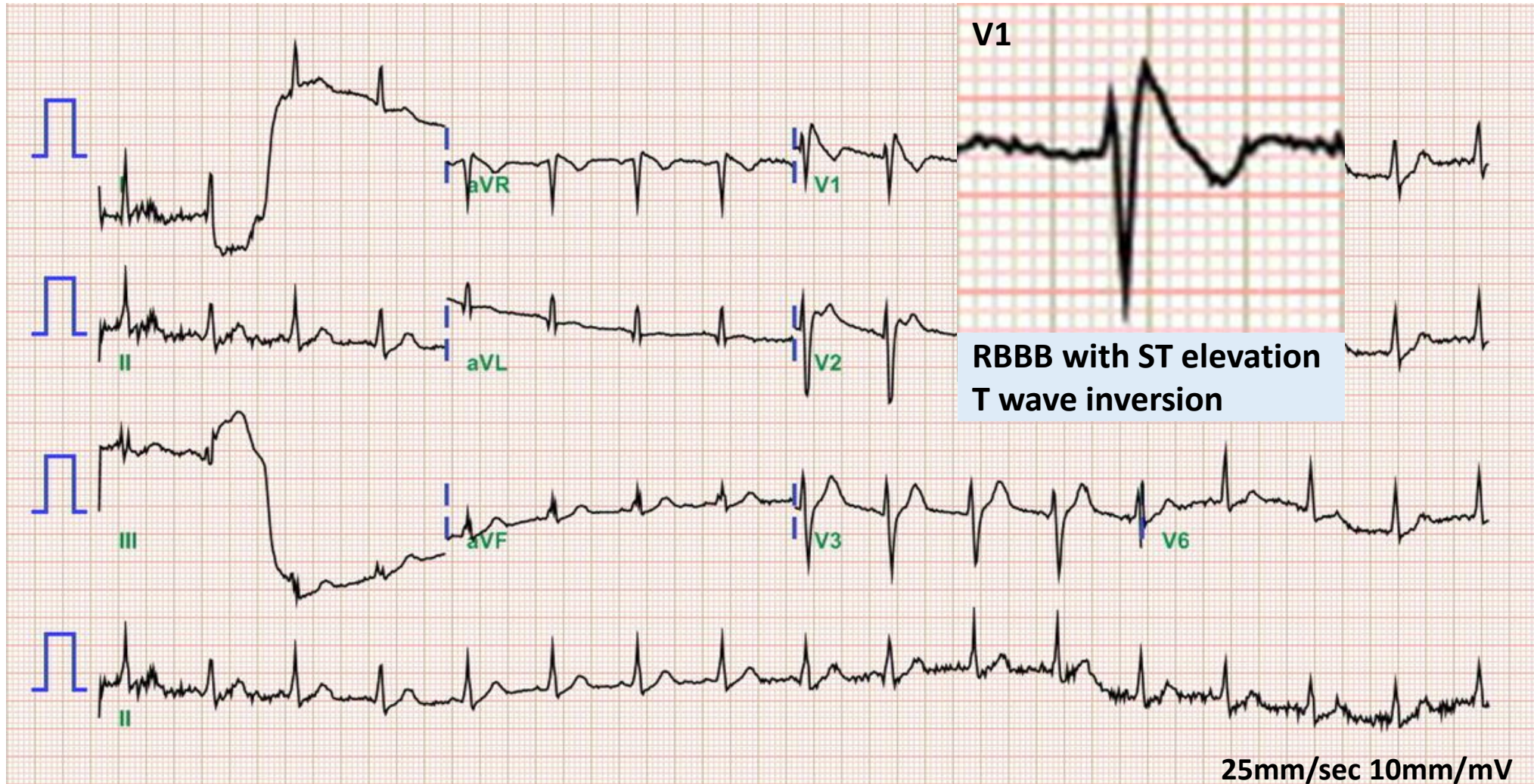


60 year-old male patient

Cardiac arrest during talking



ECG after cardioversion



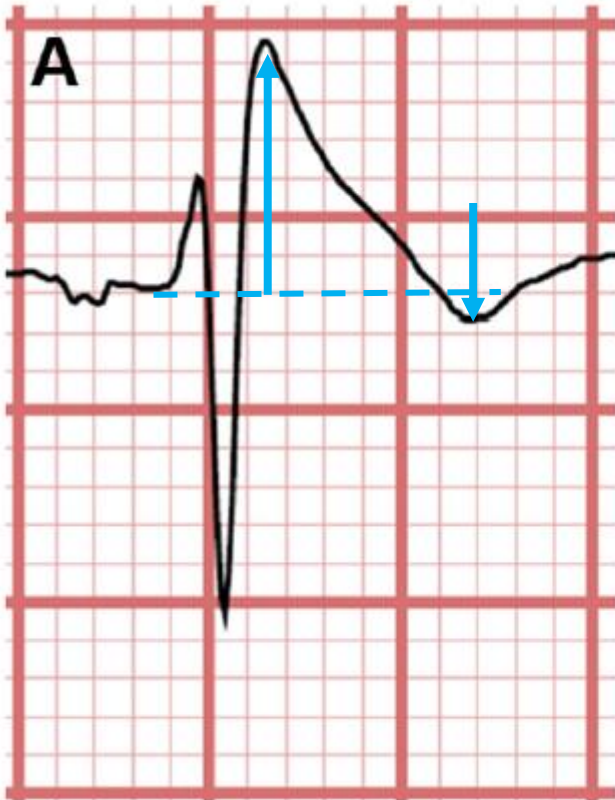
Coronary angiography : no significant stenosis

SCN 10A (+)



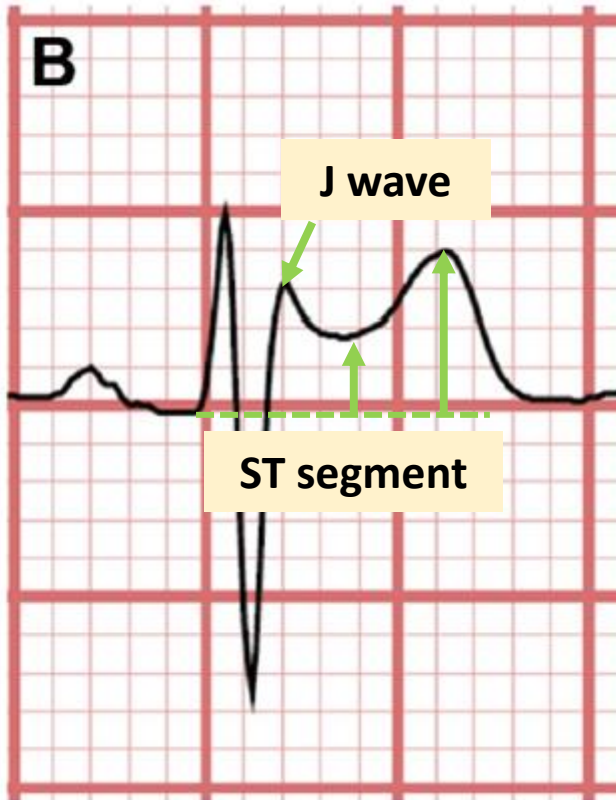
Brugada pattern ECG

Type 1. coved type



Brugada syndrome

Type 2. saddle-back

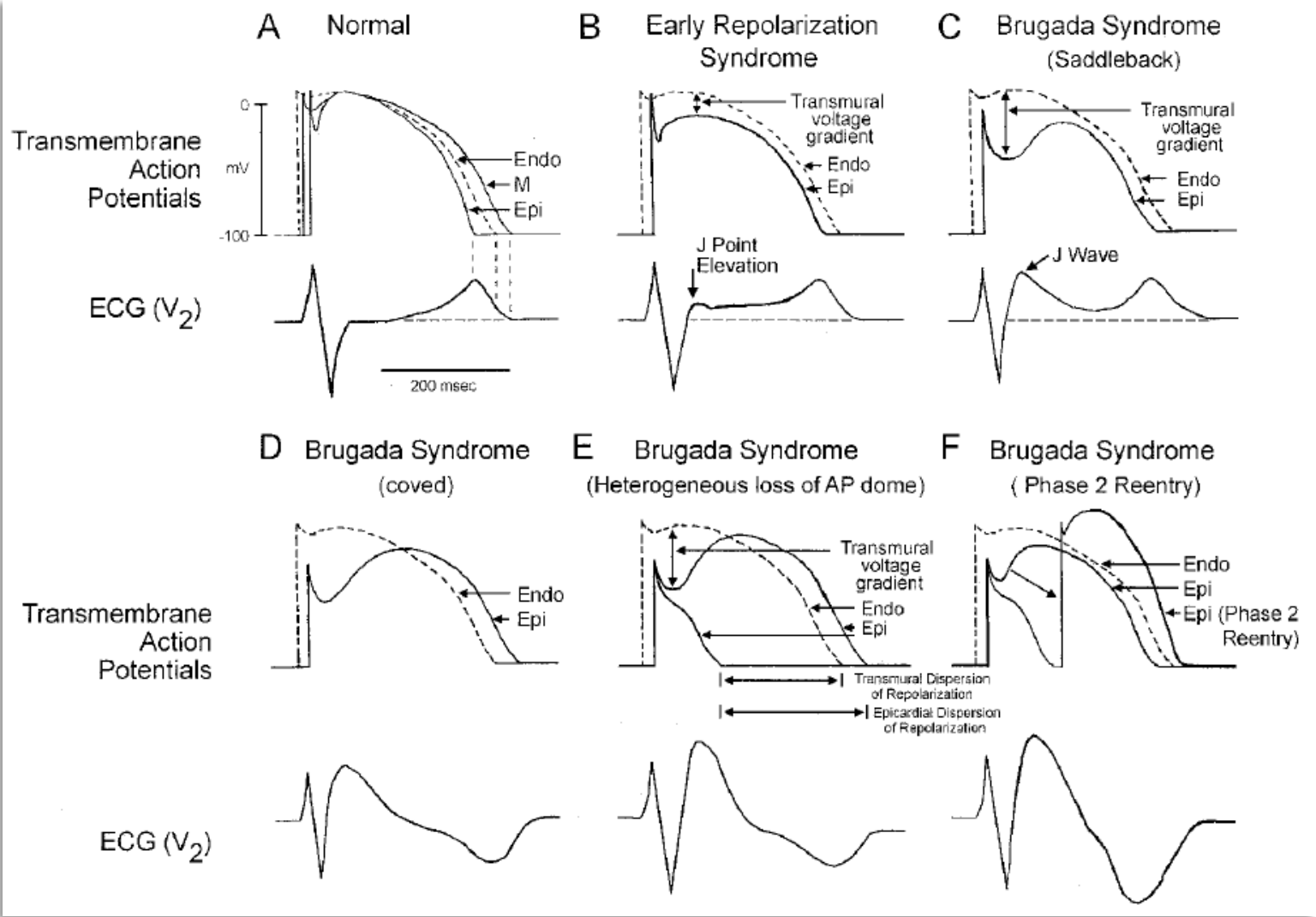
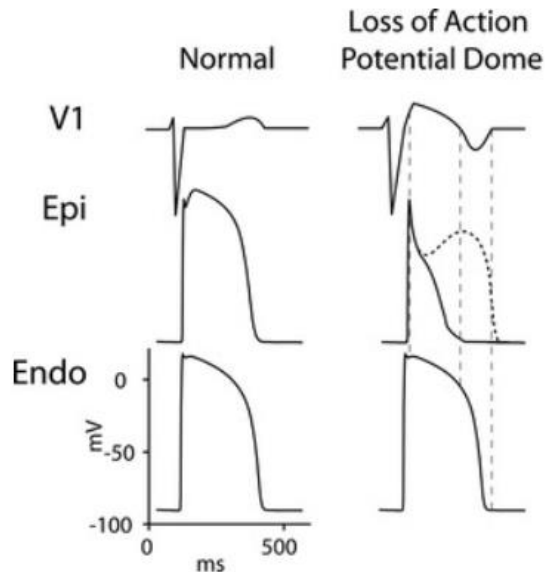
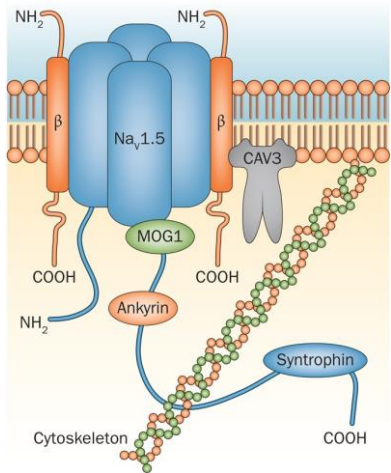


Brugada pattern

Type 3. saddle-back



Action potential



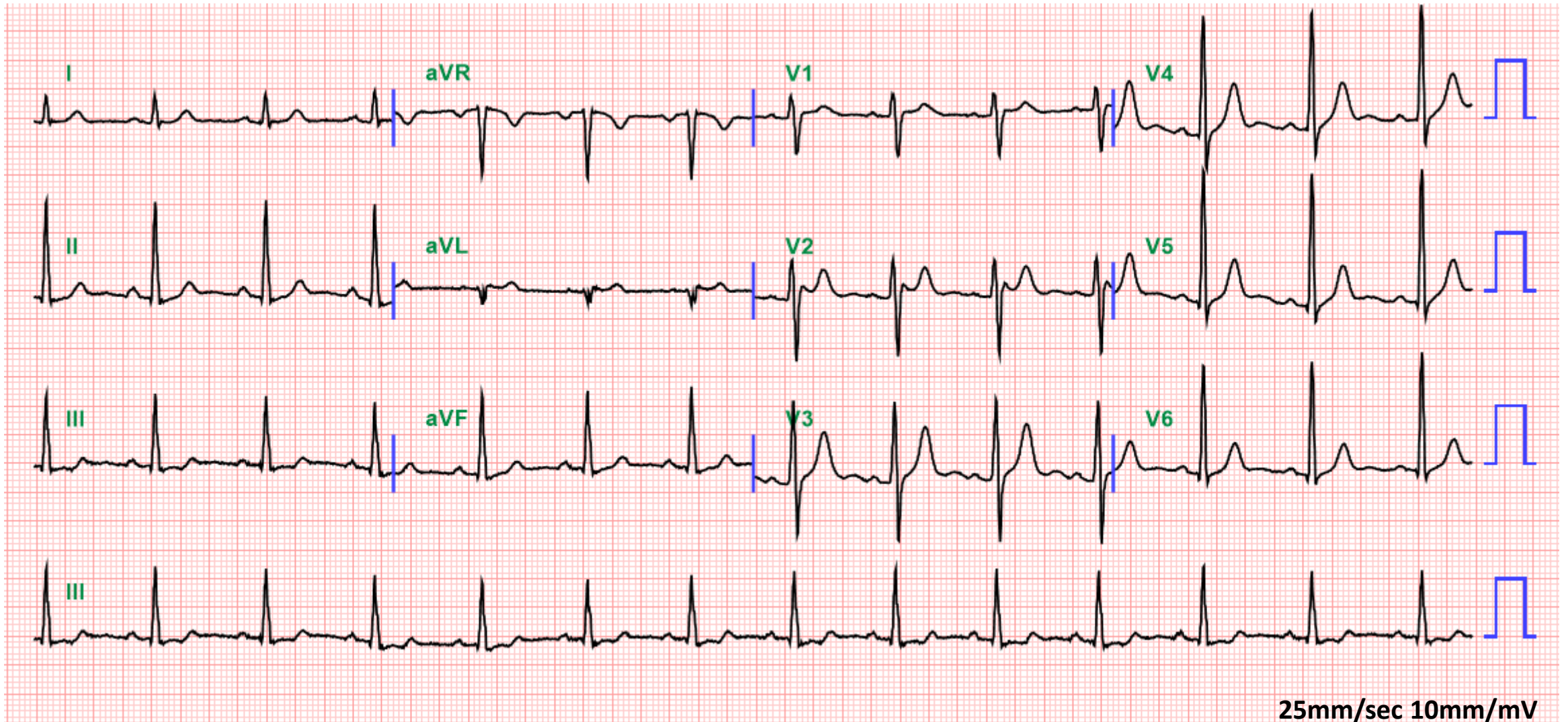
Circ Arrhythm Electrophysiol. 2010;3:283-290.

J Cardiovasc Electrophysiol, Vol. 12, pp. 268-272, February 2001

KHRS 2023



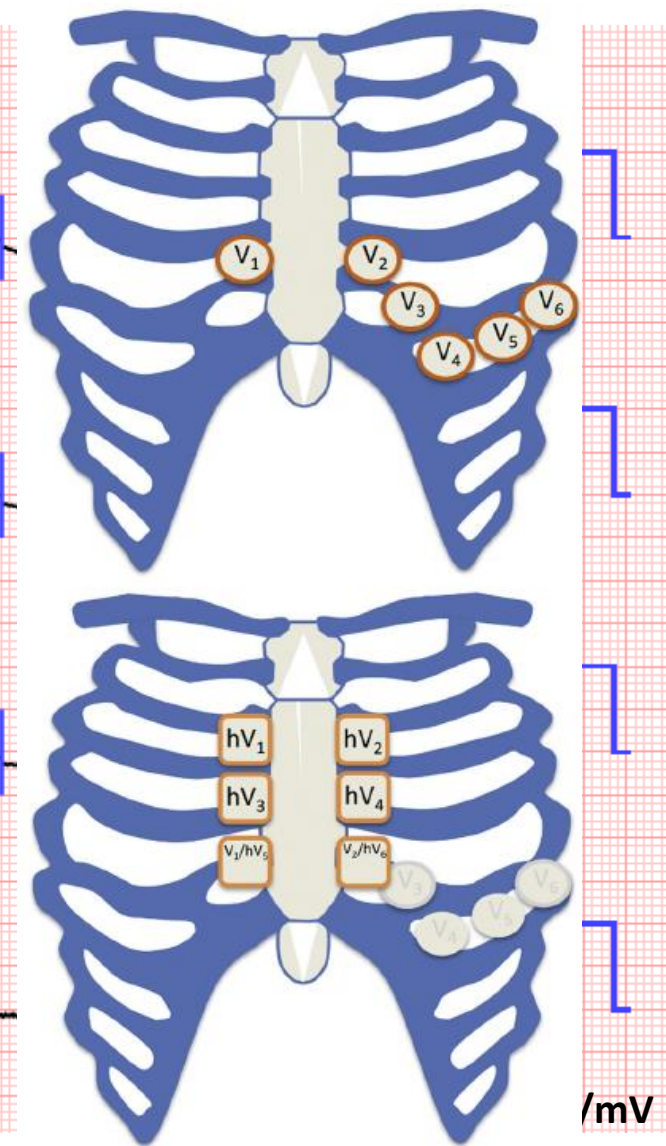
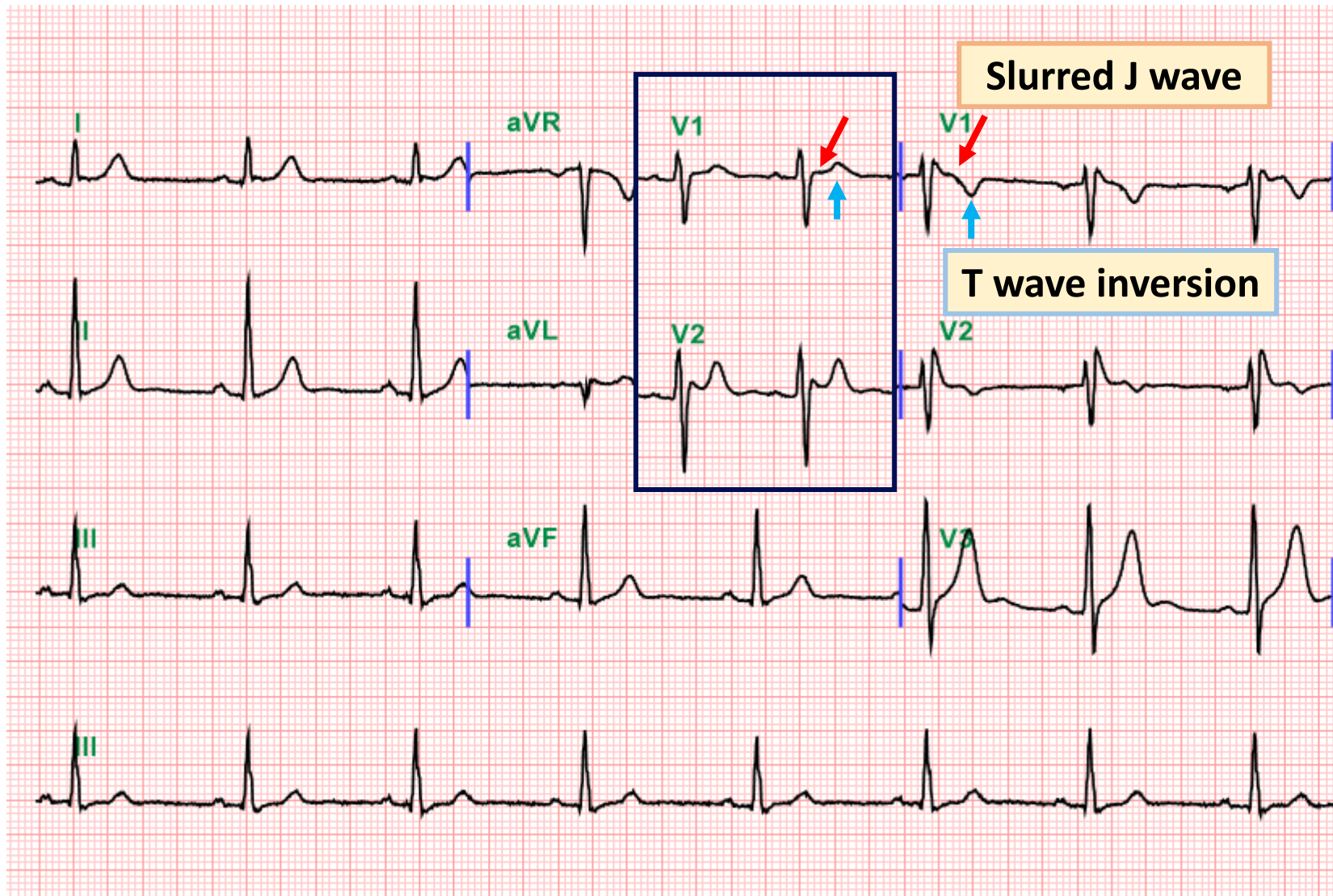
38 year-old male patient



25mm/sec 10mm/mV

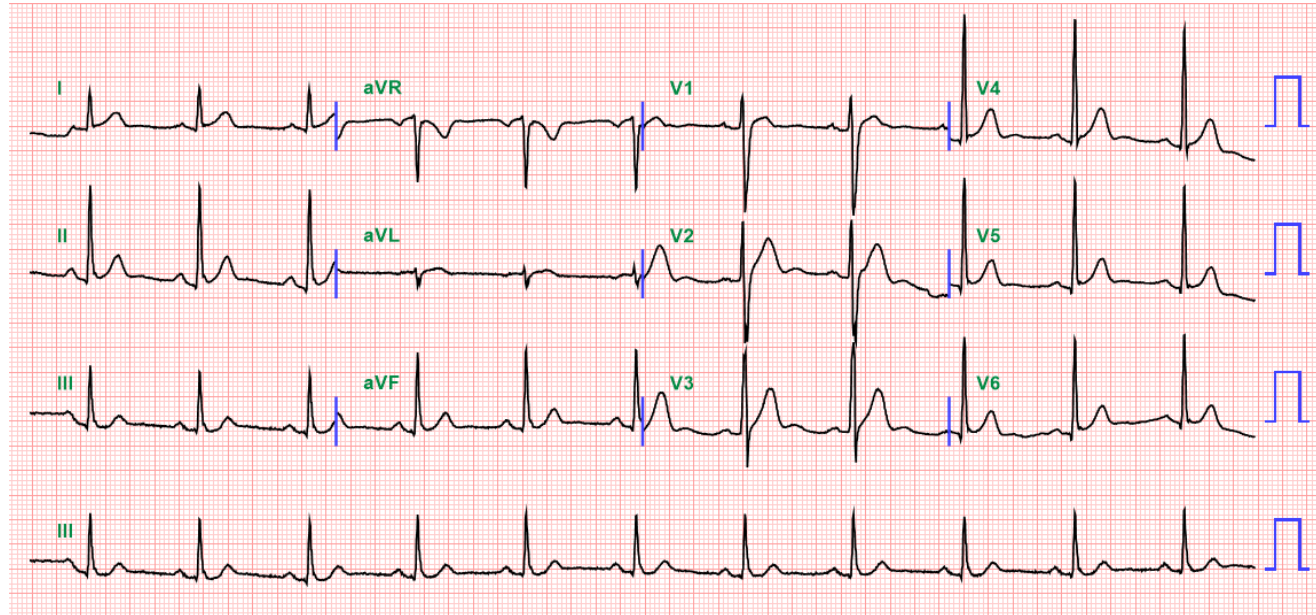
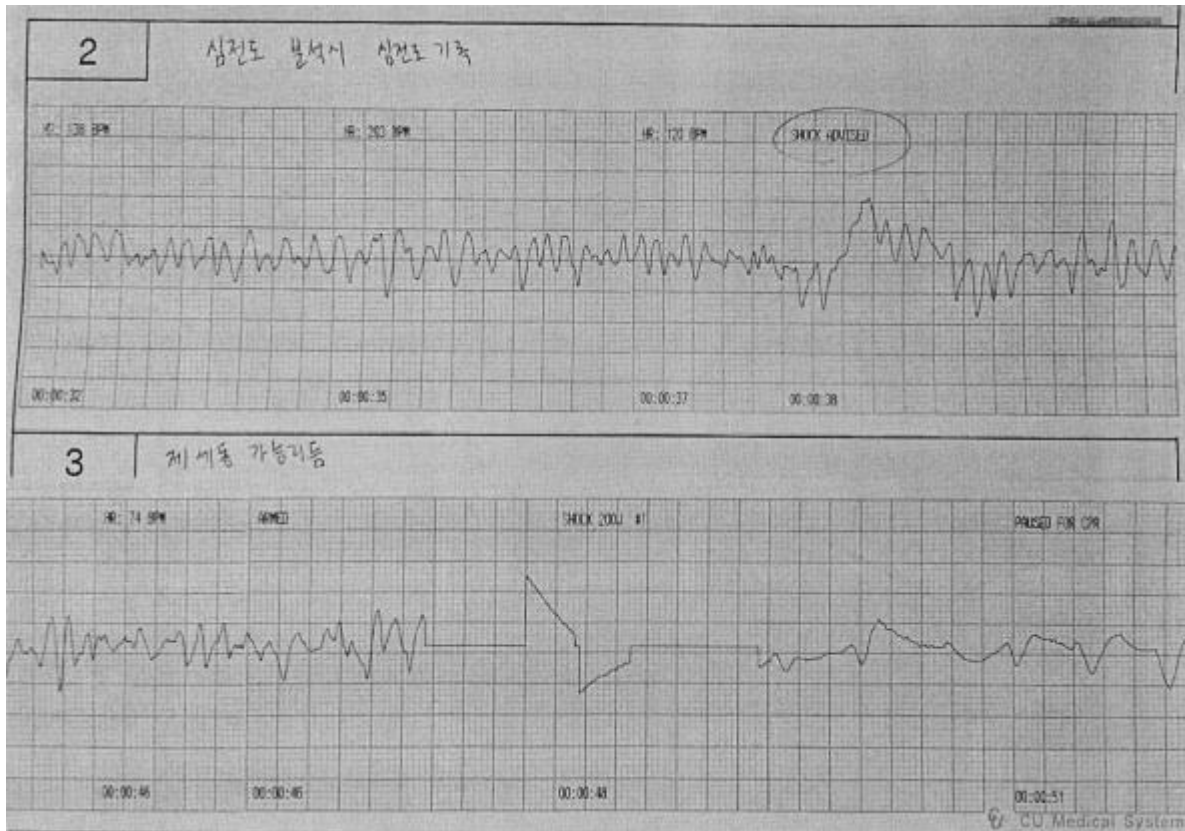


V1, V2 level up



41 year-old male patient

Past medical history (-), family history of sudden cardiac death (-)
Cardiac arrest during breakfast



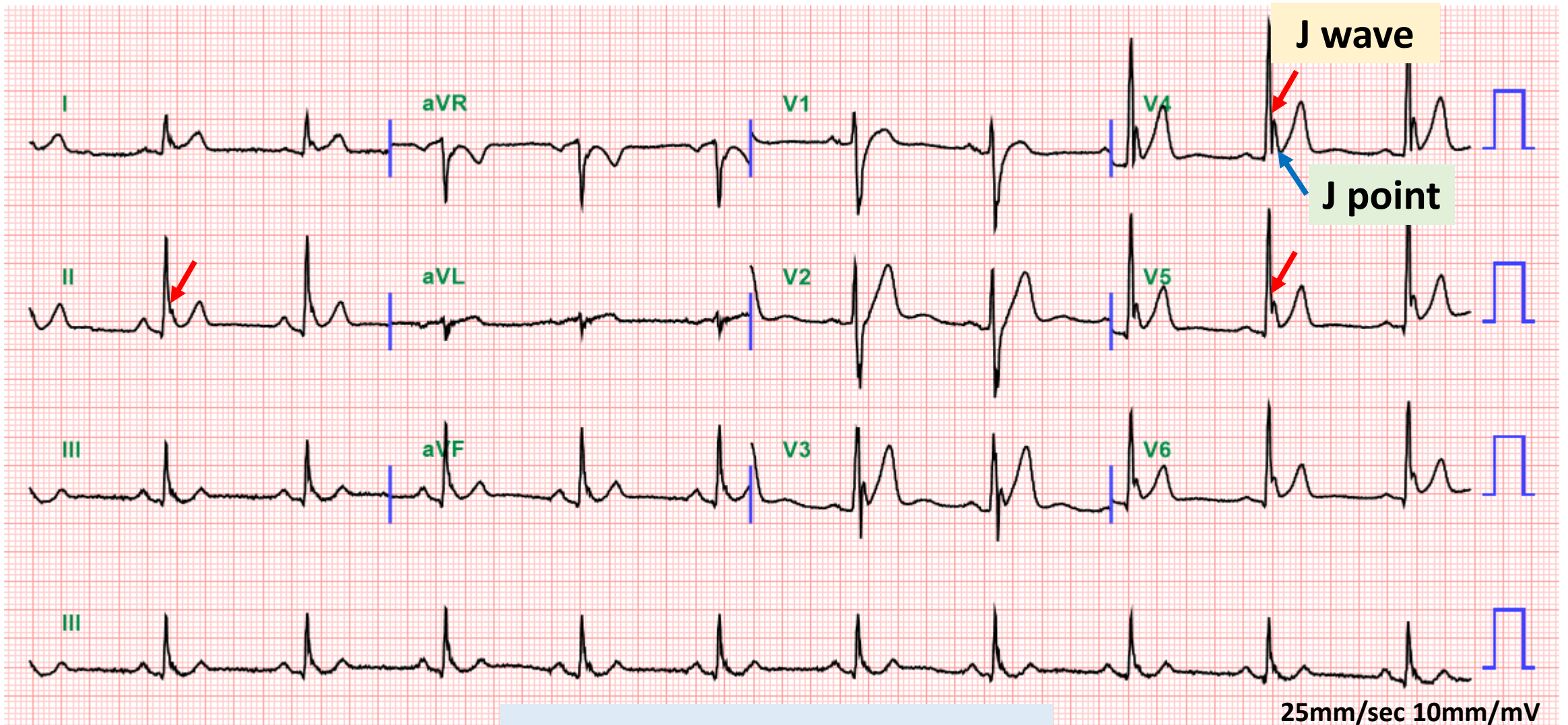
Provocation test

Epinephrine test : negative (no QT prolongation)

Flecainide test : negative (no ST elevation)



ECG at OPD f/u



J wave syndrome



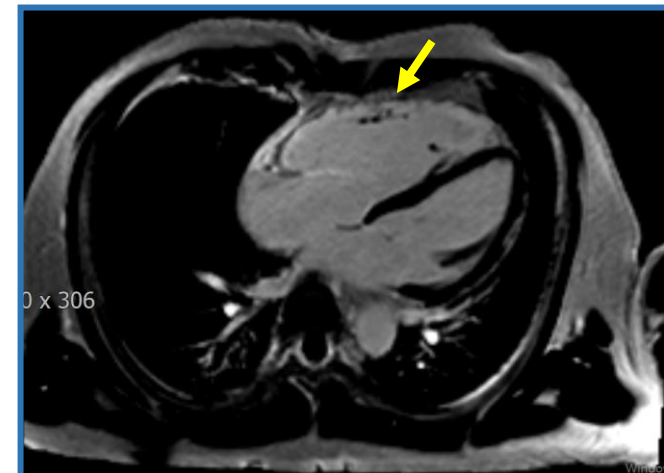
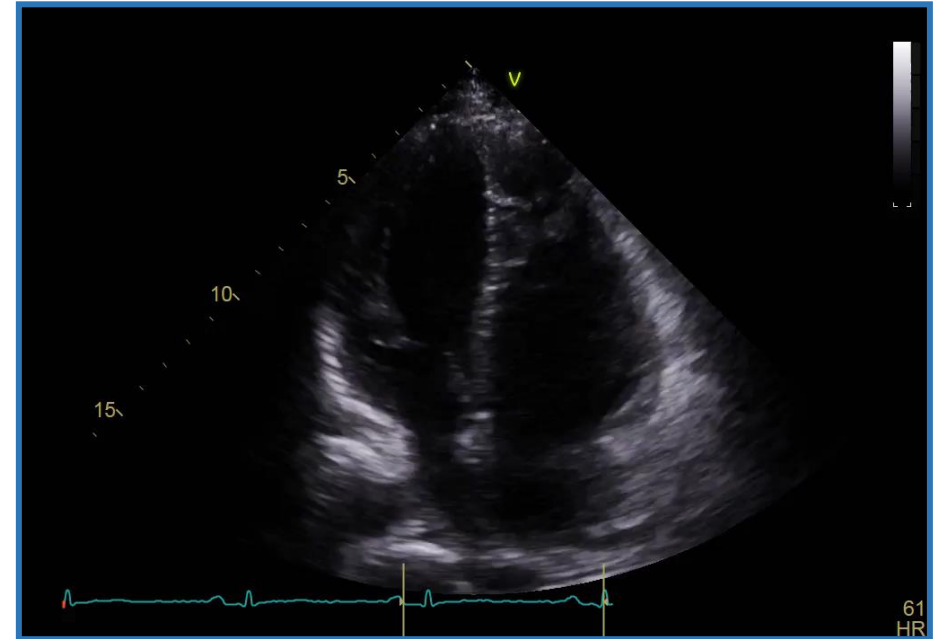
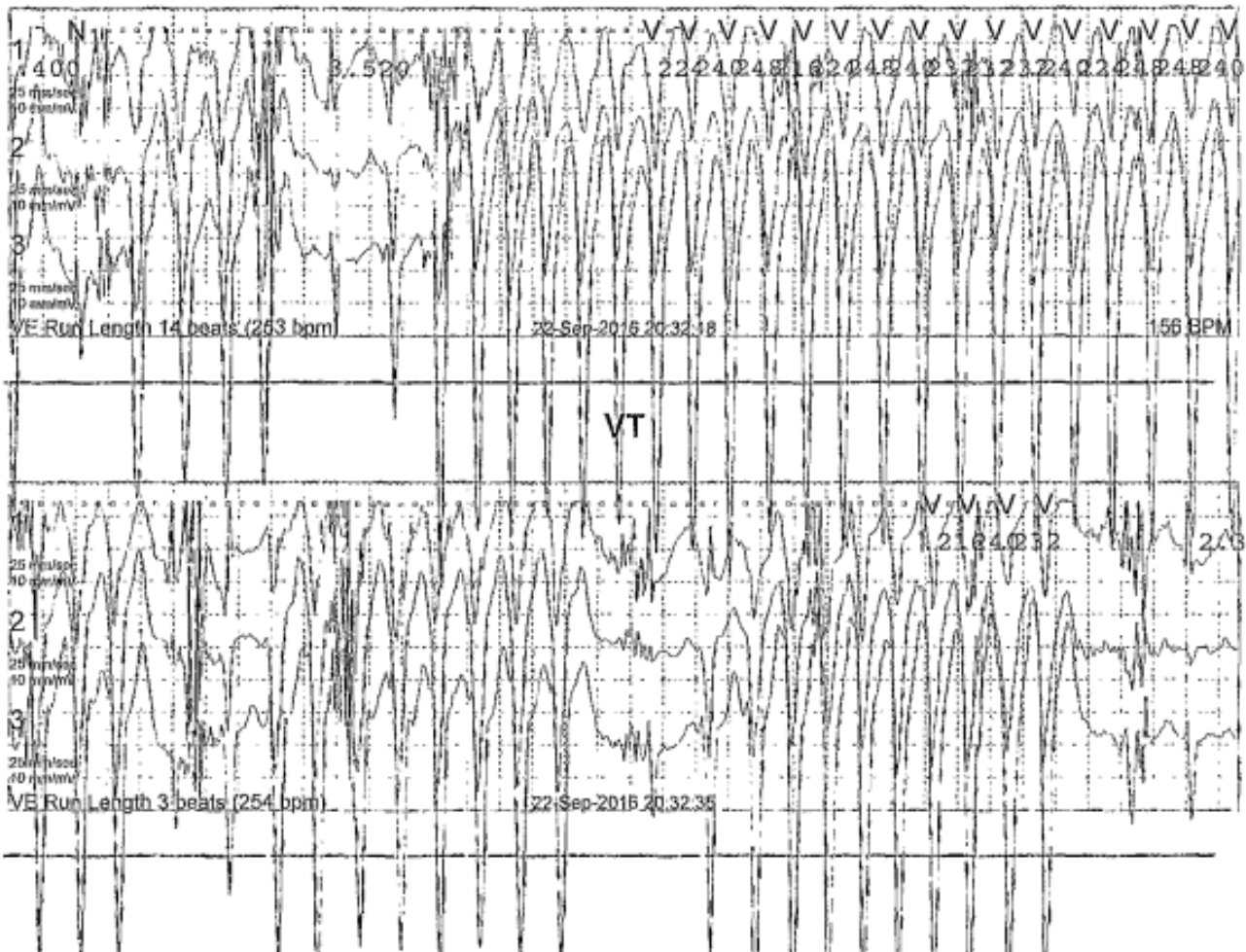
Agenda

- Long QT syndrome
- Brugada syndrome
- **Arrhythmogenic right ventricular cardiomyopathy**
- Hypertrophic cardiomyopathy



43 year-old male patient

HBV carrier, Syncope after palpitation during exercise



43 year-old male patient

Gene
Classification
Accession
DNA change
AA change
Zygoty
Type
Disease
Inheritance

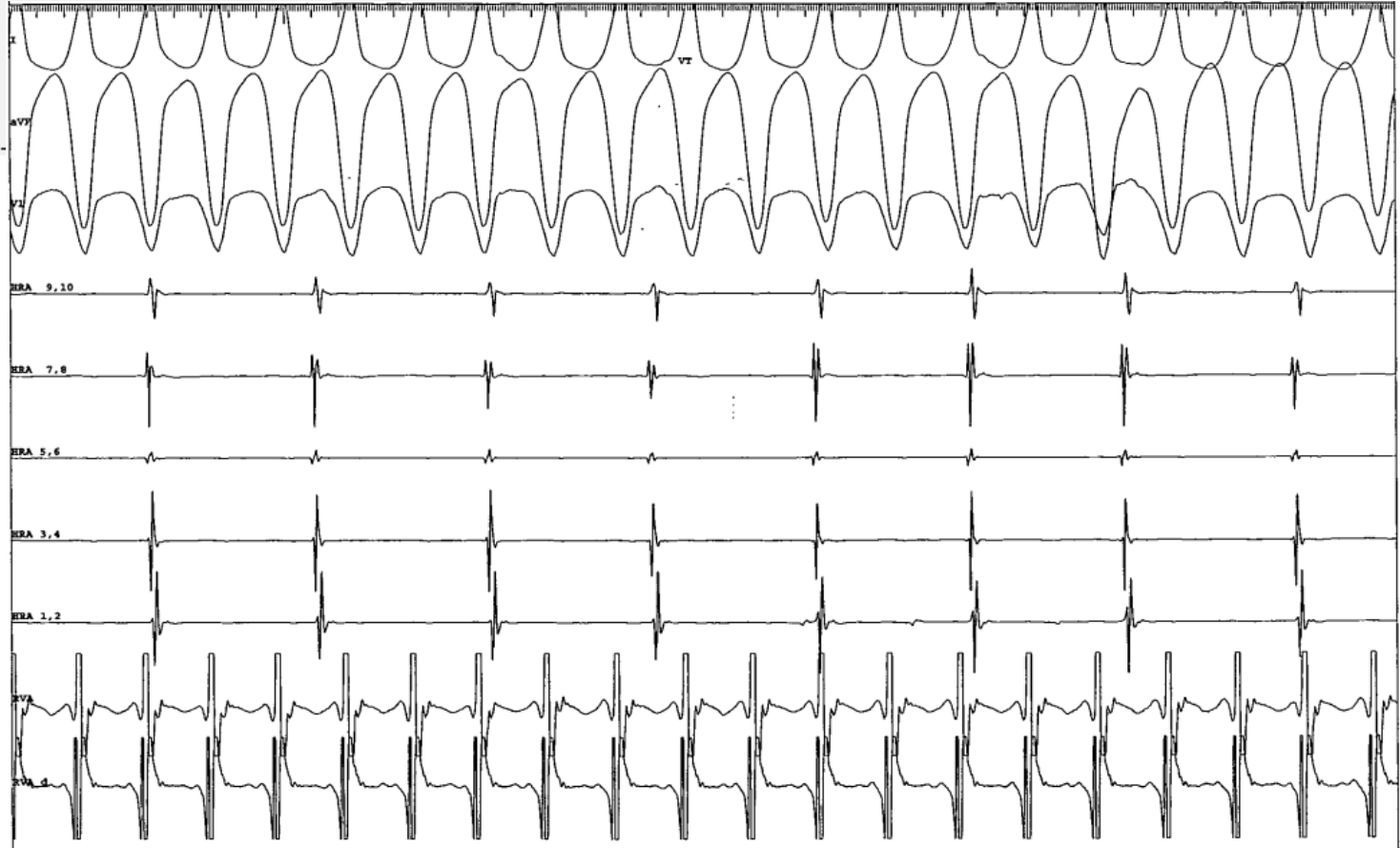
PKP2

NM_004572.3
c.962del
p.Val321Alafs+31
Het

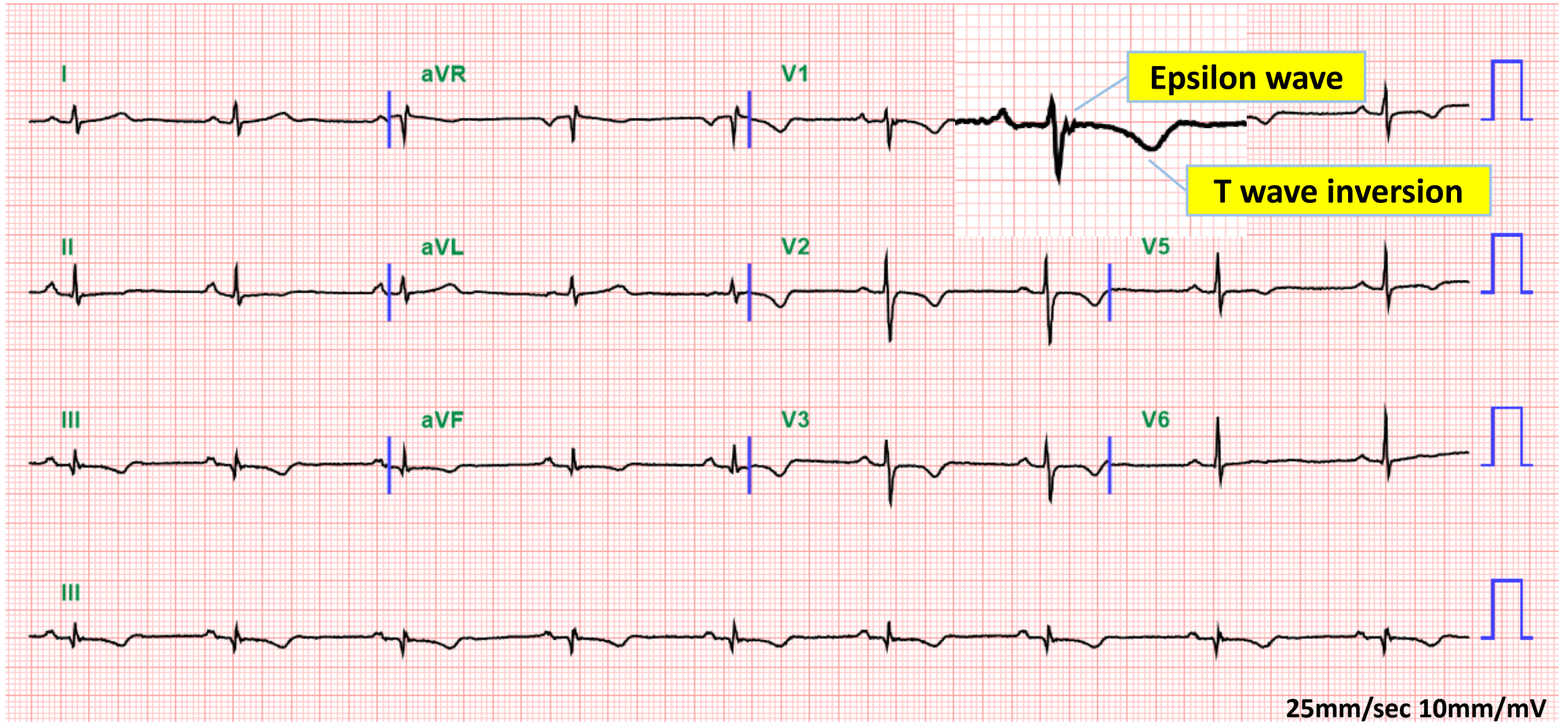
ARVC
AD

EPS

Genetics



43 year-old male patient



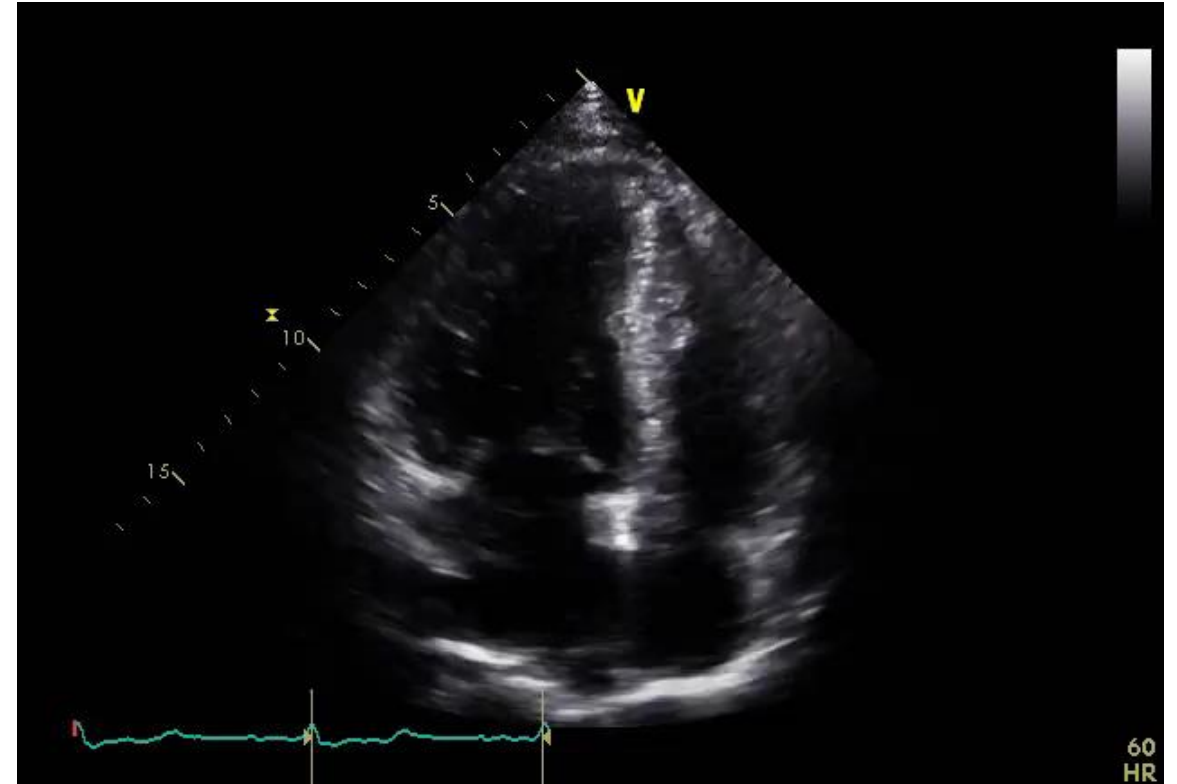
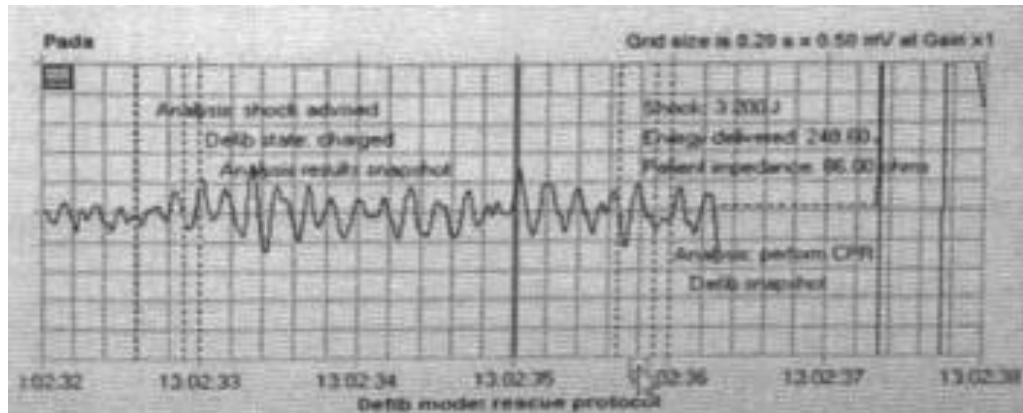
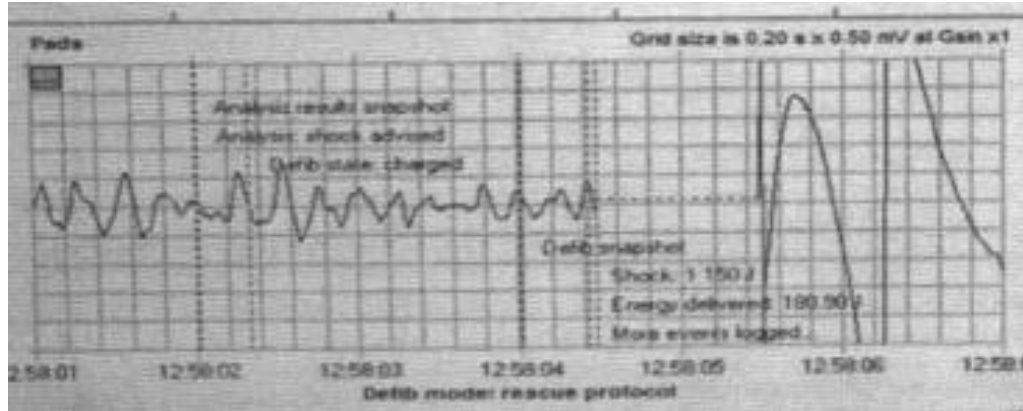
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47 year-old male patient

RFCA d/t Atrial fibrillation

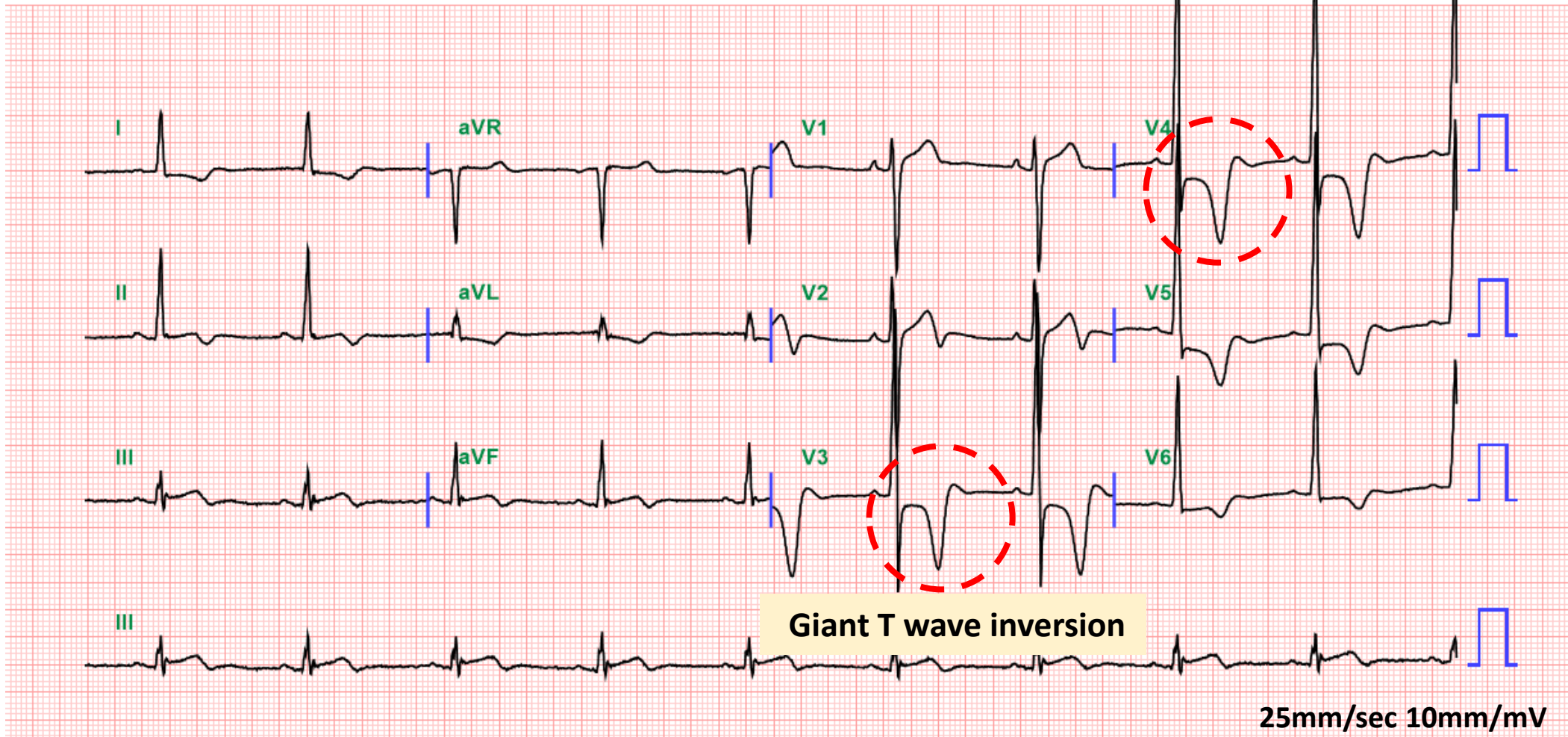


HCM apical type

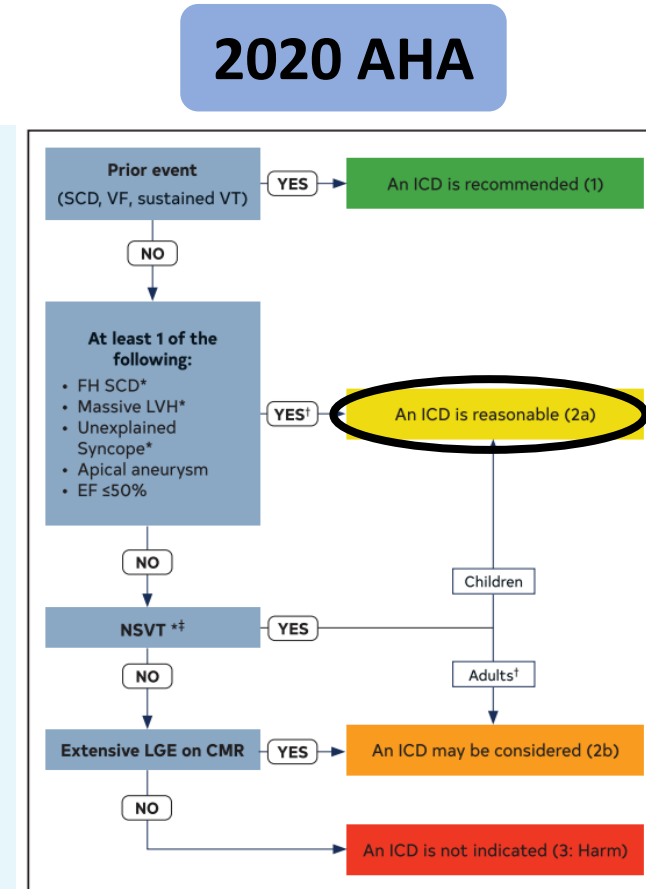
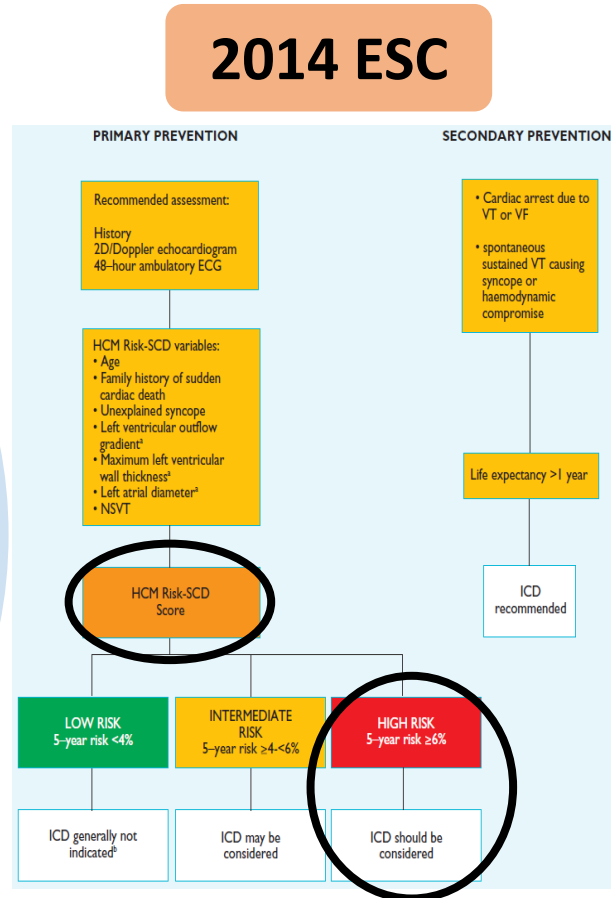
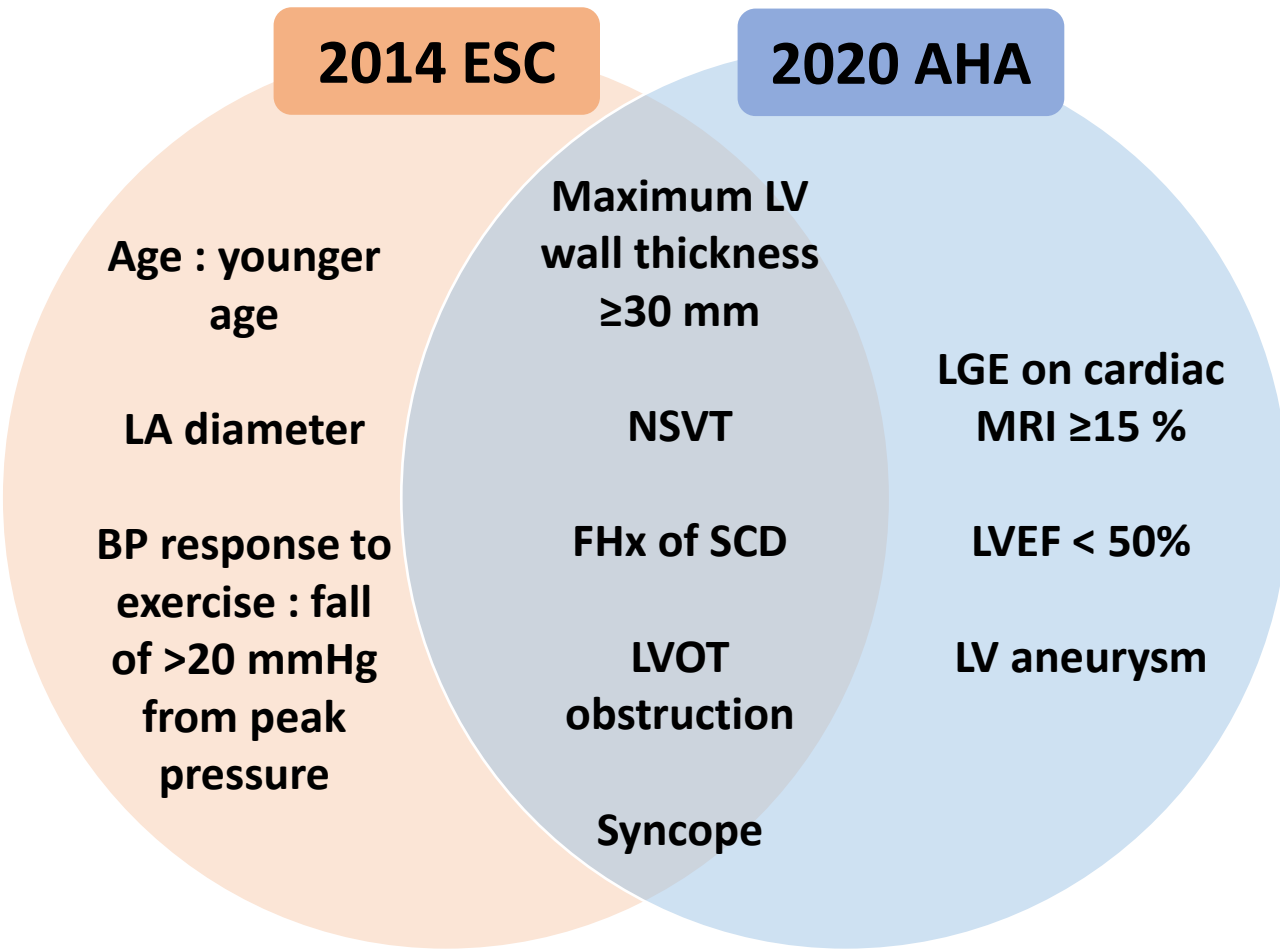


47 year-old male patient

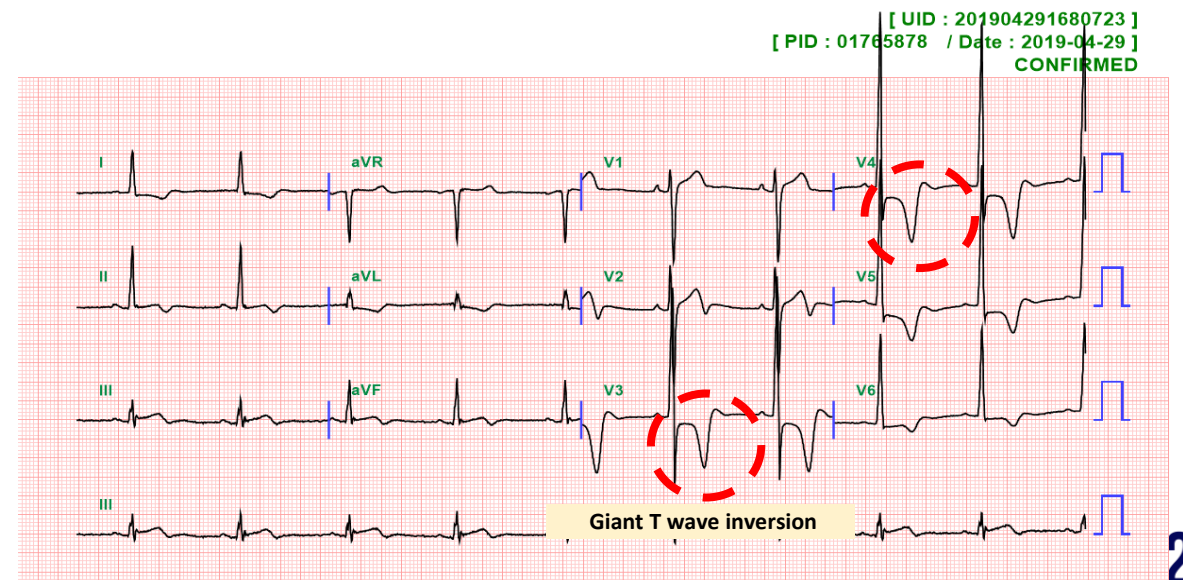
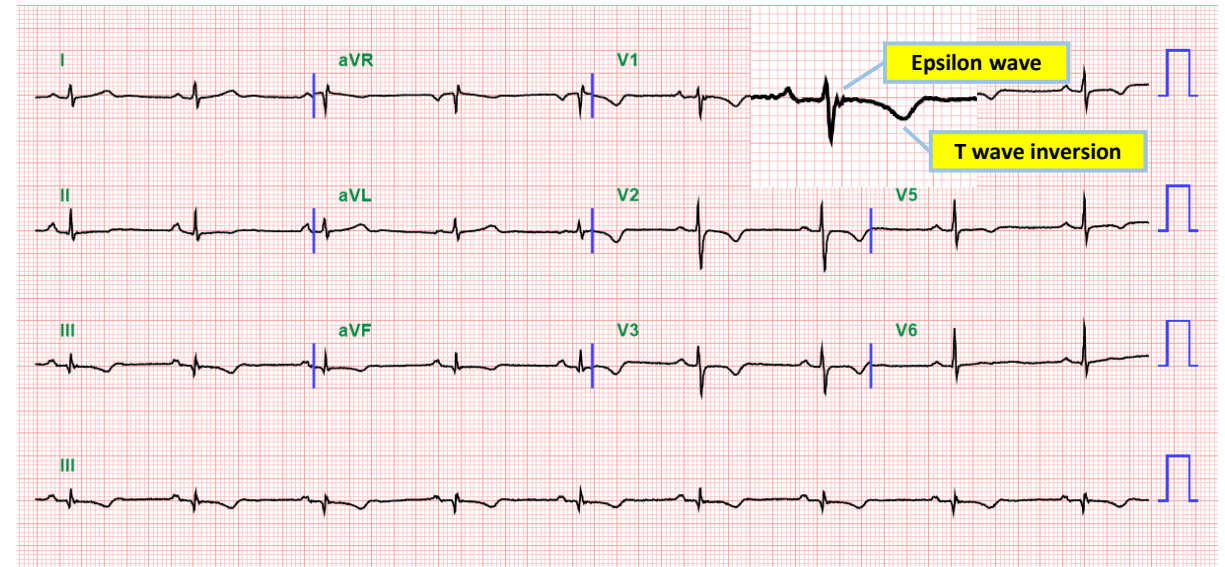
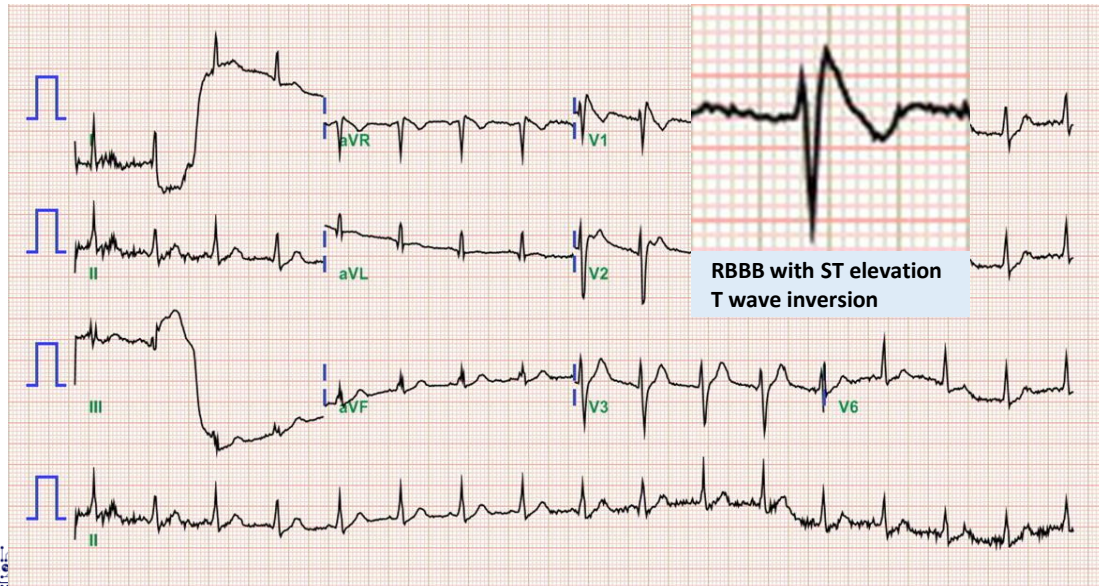
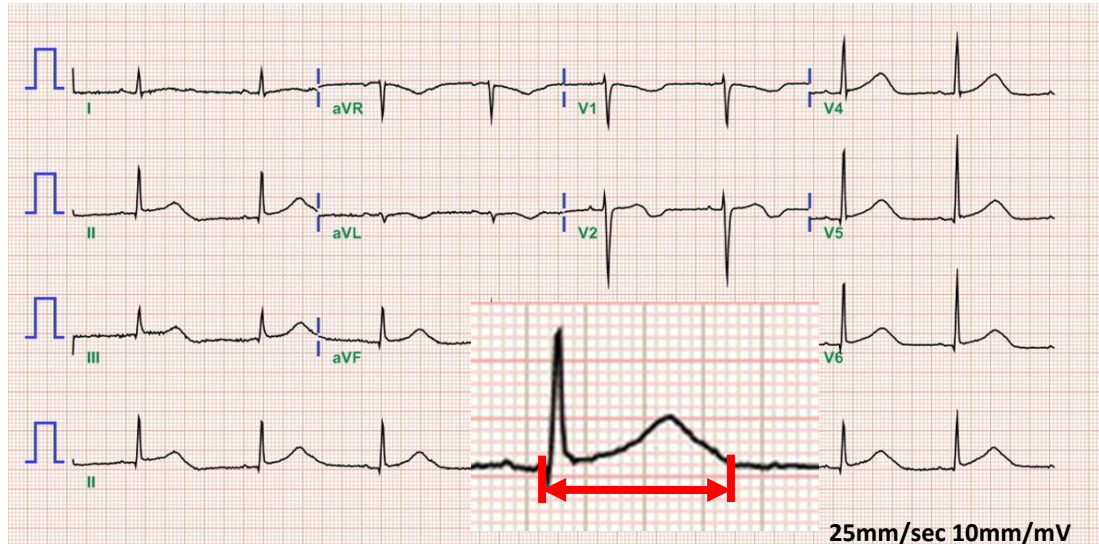
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CONFIRMED



SCD risk assessment



Take Home Message



Thank you for your attention