

Syncope Review

Dine and Zoom



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Jump Right in! Case 1

- ◇ 19 year old elite athlete
- ◇ Needs clearance to go off to college.
- ◇ Has fainted twice before when getting lab tests.
- ◇ No PMHx
- ◇ No worrisome FHx
- ◇ Outpt/Consult/ER?



Objectives Regarding Syncope

1. Review broad classification
2. List differential diagnosis
3. Describe an approach
4. Identify high and low risk features
5. Have 7 high risk ECG samples for reference
6. Identify need for outpatient care or referral.



Conflict of Interest



Syncope Classification

(four broad categories)

1. Reflex (Neurally Mediated)

45%

2. Orthostatic 10%

3. Cardiac 20%

4. Cerebrovascular (rarely)

Vertebro-Basilar Stroke or
steal syndromes

Not determined (the rest)



Reflex (Neurally Mediated)

Parasympathetic Activation is Common Theme



- ◇ Vasovagal
- ◇ Carotid sinus hypersensitivity
- ◇ Cough/sneeze
- ◇ G.I.
- ◇ Micturition
- ◇ Post exercise
- ◇ Others...

Orthostatic

◆ Autonomic

- ◆ Primary (Parkinson's etc)
- ◆ Secondary
 - ◆ MEDS!!!!
 - ◆ Diabetic neuropathy, amyloid..

◆ Volume Depletion



Cardiac

Rhythm

- ◇ Sinus disorders (e.g., sinus pauses)
- ◇ AV blocks (e.g. 3rd degree AVB)
- ◇ Tachycardias (more ventricular, but can be supraventricular also)
- ◇ Inherited Syndromes (prolonged QT, Brugada)
- ◇ Developmental Malformations (IHHS)
- ◇ Drug Induced (causing various arrhythmias)

Structural

- ◇ Valvular (Aortic Stenosis)
- ◇ Infarct
- ◇ Obstructive Cardiomyopathy
- ◇ Atrial Myxoma (obstruction of MV)
- ◇ Aortic Dissection
- ◇ Tamponade
- ◇ PE
- ◇ Pulmonary Hypertension (RV wall stress with effort, autonomic activation...)

Case Two

- ◇ 80 yo female
- ◇ Fatigue, recurrent fainting spells over the last week.
- ◇ Loss of consciousness follows a period of profound fatigue and lightheadedness
- ◇ One episode occurred in bed.
- ◇ Multiple meds including for BP and rate control for A. Fib.
- ◇ Outpt/Conult/ER?



Differential Diagnosis

Loss of Consciousness

- ◇ Metabolic (hypoglycemia)
- ◇ Seizure
- ◇ Toxicology
- ◇ Vertebro-basilar TIA

No loss of Consciousness

- ◇ Cataplexy
- ◇ Drop attacks (grab bag term for unexplained fall with multiple possible etiologies including functional)
- ◇ Psychogenic



Case 3

- ◇ 52 yo male. Opiate use disorder.
- ◇ Has nausea, requesting “that dance-tron medicine”
- ◇ Recent pneumonia, d/c from hospital 2 days ago on moxifloxacin
- ◇ Sudden LOC with no warning, immediate recovery
- ◇ Other medications include methadone and quetiapine
- ◇ Outpt/Consult/ER?



Approach

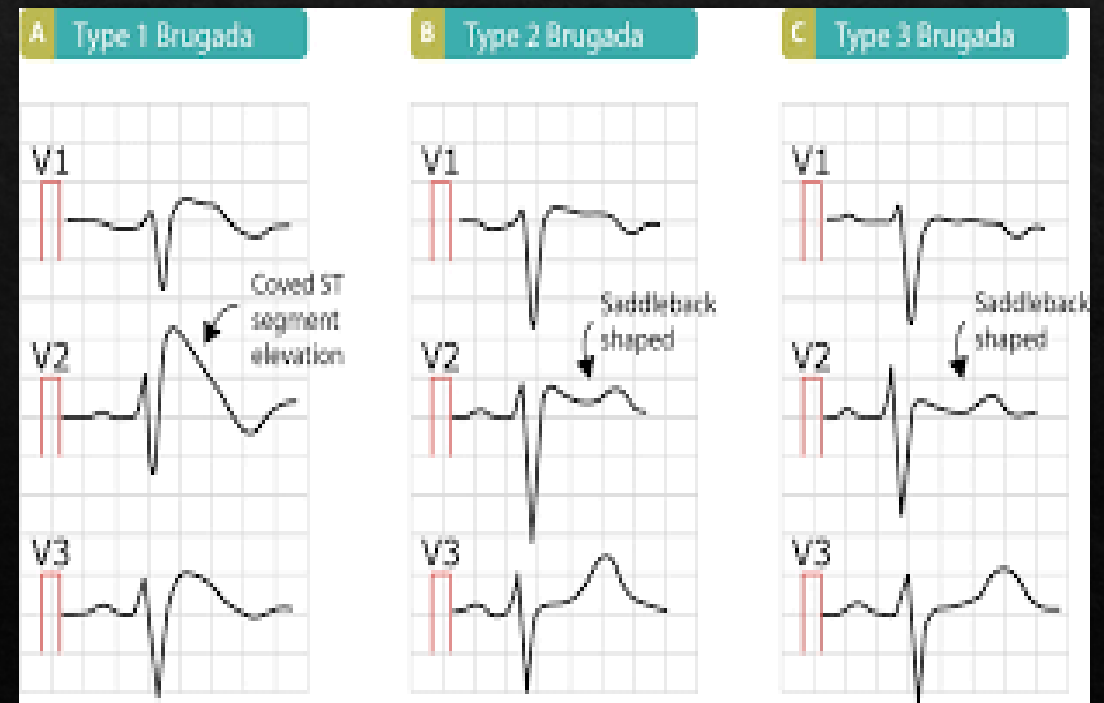
1. It's all in the **HISTORY** (gives dx in 50%)
2. **Physical exam**: murmur, postural VS
3. **ECG** (3-5 % yield)
4. **Lab** low yield. Tailor as per Hx and Px
5. Look for high and low **risk features**
6. Order **outpatient investigations** as indicated: holter, echo, etc.
7. **Refer** high risk: ER or Consult? You decide...



Seven ECG Abnormalities (there's more...)

- ◇ Prolonged QT (>500 clinically signif)
- ◇ Preexcitation (WPW)
- ◇ Brugada Syndrome
- ◇ Pulmonary Embolism
- ◇ Arrhythmogenic RV Cardiomyopathy (fatty infiltration of RV free wall)
- ◇ Hypertrophic Cardiomyopathy (IHHS)
- ◇ Dilated Cardiomyopathy

Brugada Syndrome



Low Risk/High Risk Features

LOW RISK

- ◇ Age <50
- ◇ No heart disease
- ◇ Normal ECG
- ◇ Hx consist with reflex or orthostatic
- ◇ Normal CV exam

HIGH RISK

- ◇ Older age
- ◇ Structural Heart Disease/CHF/CAD
- ◇ Abnormal ECG
- ◇ Hx suggests arrhythmia
- ◇ Hypotension
- ◇ FHx sudden death

Some Historical Features

HIGH RISK

- ◇ No prodrome
- ◇ Supine onset
- ◇ FHx sudden death
- ◇ Exercise induced
- ◇ Pulse abnormality before or after
- ◇ Associated with chest pain or other cardiopulmonary sx
- ◇ Immediate complete recovery suggests arrhythmia

LOW RISK

- ◇ Vagal symptoms
- ◇ Clear trigger/recurrent episodes
- ◇ Predisposing stressors for vasovagal, volume depletion, other reversible variables.
- ◇ Change in position, prolonged standing
- ◇ Eyes closed suggests psychogenic

Case 4

- ◇ 75 yo female
- ◇ Progressive left arm pain while playing tennis
- ◇ Two episodes of sudden loss of consciousness.
- ◇ First episode when stocking a cabinet above her head
- ◇ Second episode when vigorously trimming the hedge!
- ◇ Outpt/Consult/ER?



Decision Rules and Guidelines

- ◇ No rules validated for outpatient (e.g., SF Syncope Rule not so hot...)
- ◇ Canadian Syncope Rule for ED may gain traction. Still validating...
- ◇ Canadian Cardiovascular Society Clinical Practice Update on the Assessment and Management of Syncope
 - ◇ Can. J. of Cardiolgy: 36 (2020) 1167-1177.



Case Summaries

Case 1: Healthy Athlete

- ◇ Outpt workup: normal ECG, normal exam, Hx consistent with vasovagal. Negative Fhx

Case 2: Fainting in Bed

- ◇ ER workup shows 3rd degree AVB
- ◇ Admit, ween meds

Case 3: Ondansetron Please

- ◇ ER workup shows long QT due to methadone, quetiapine, moxiflox
- ◇ Admission for VT/VF observed on monitor

Case 4: Tennis Arm

- ◇ Symptoms suggest subclavian steal. Consult with neuro or cardio results in expedited workup
- ◇ Patient to avoid upper extremity exertion.

Summary

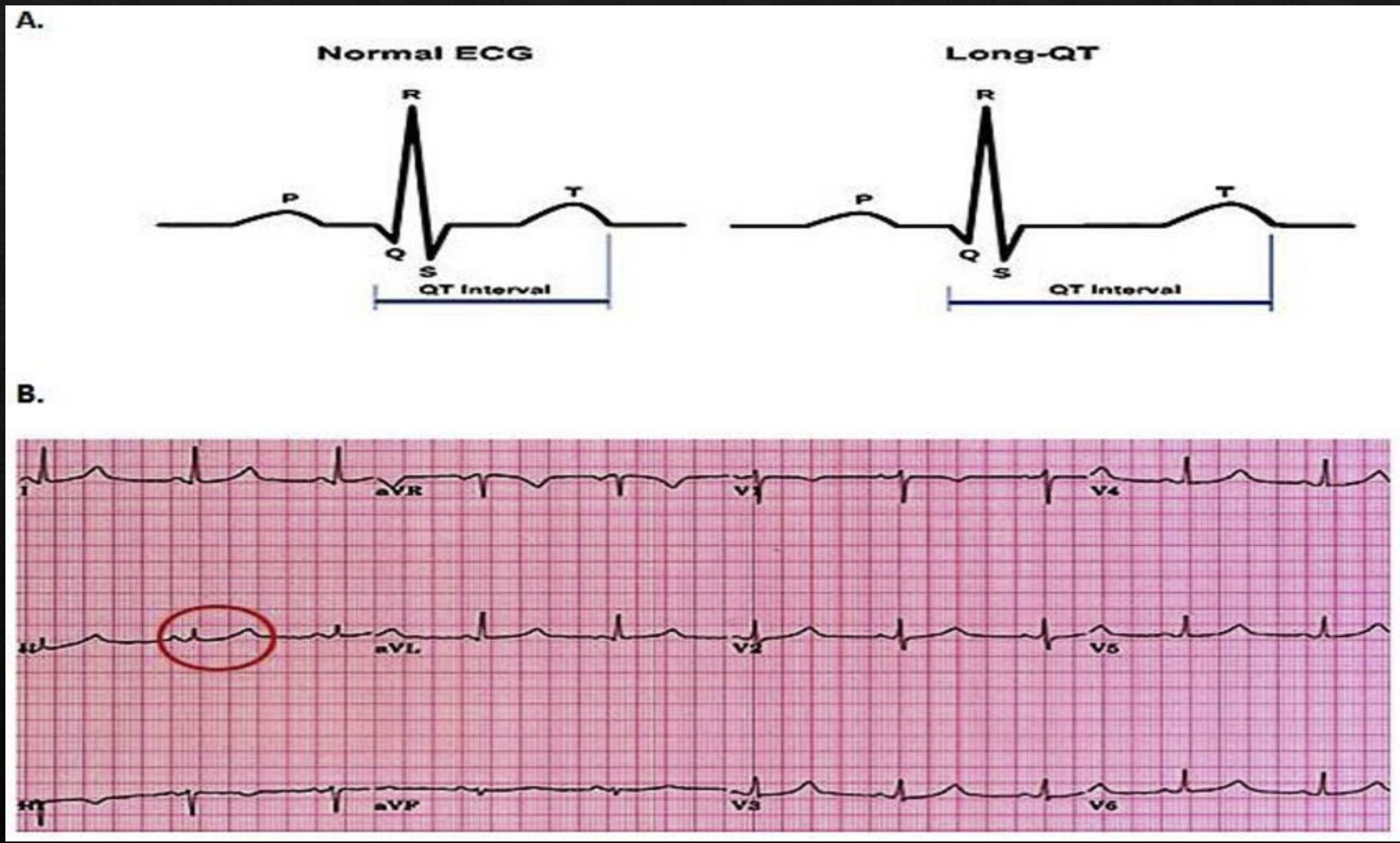
- ◇ Reflex/Orthostatic/Cardiac/Cerebrovascular?
- ◇ DDX (was it really syncope?)
- ◇ Meticulous history
- ◇ Physical: murmur, posturals, tailor...
- ◇ ECG normal?
- ◇ Low Risk/High Risk Features
- ◇ Work up your low risk with tailored investigations.
- ◇ Refer High Risk

Discussion

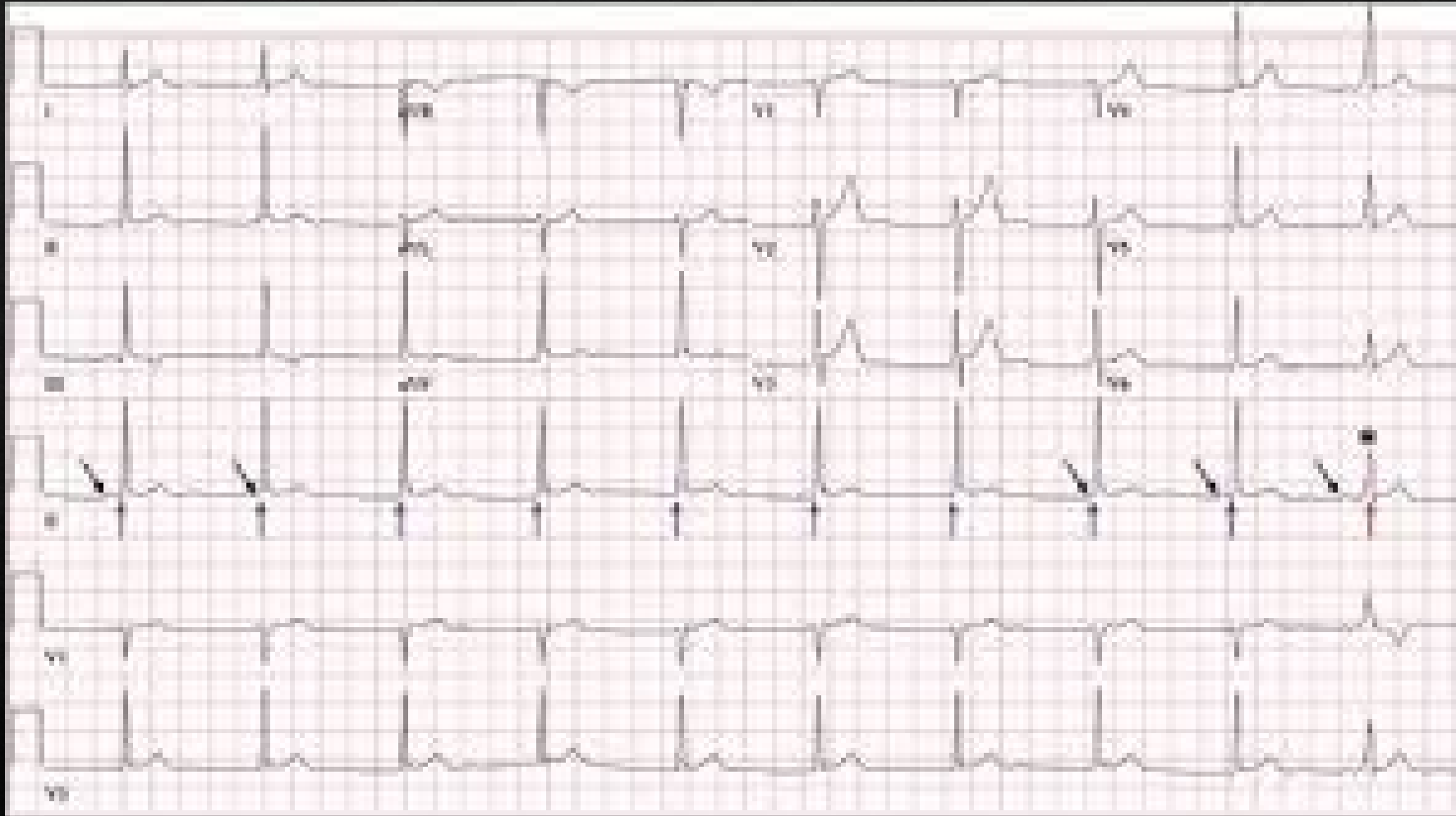


...ECGS on following slides...

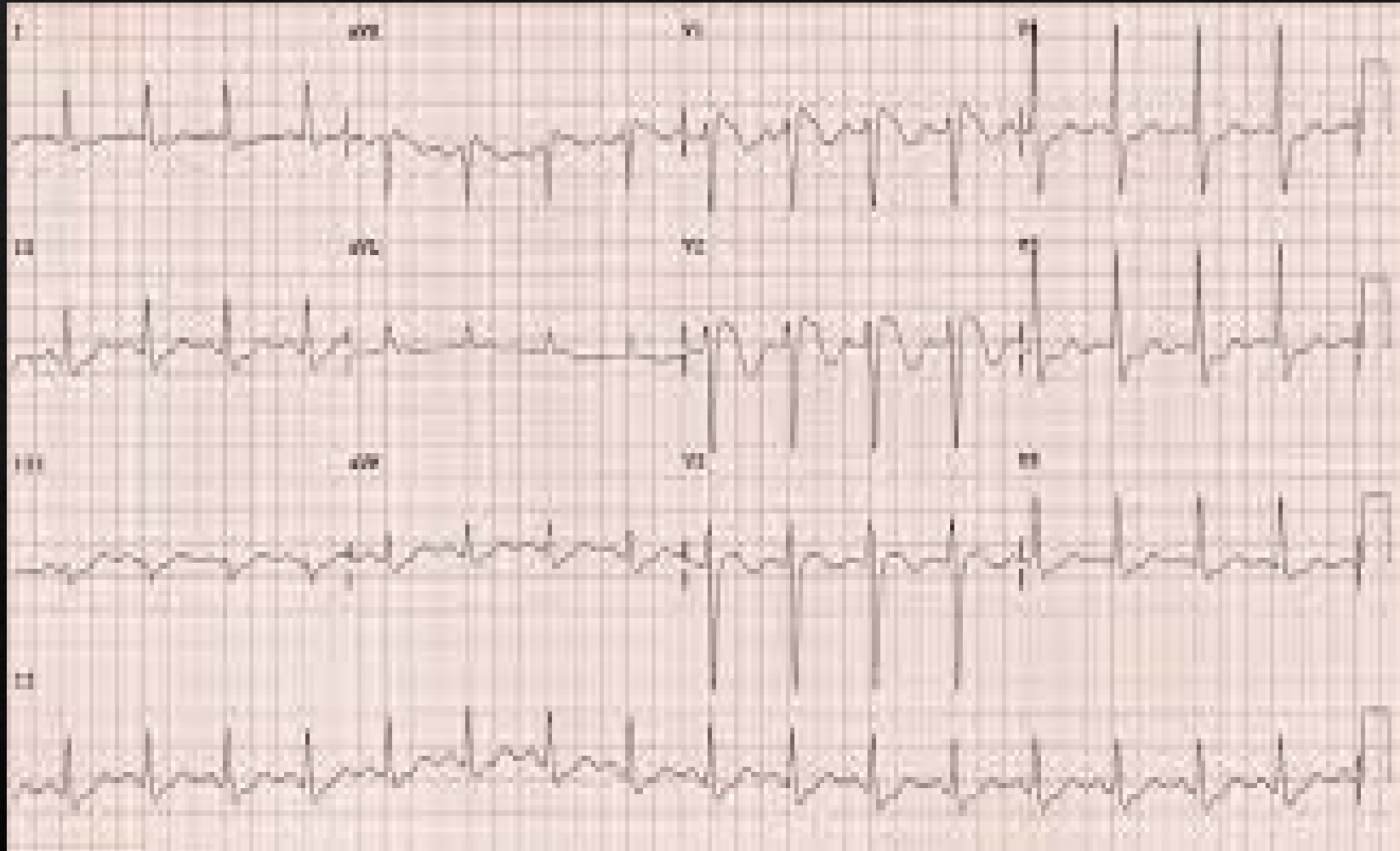
Long QT ECG



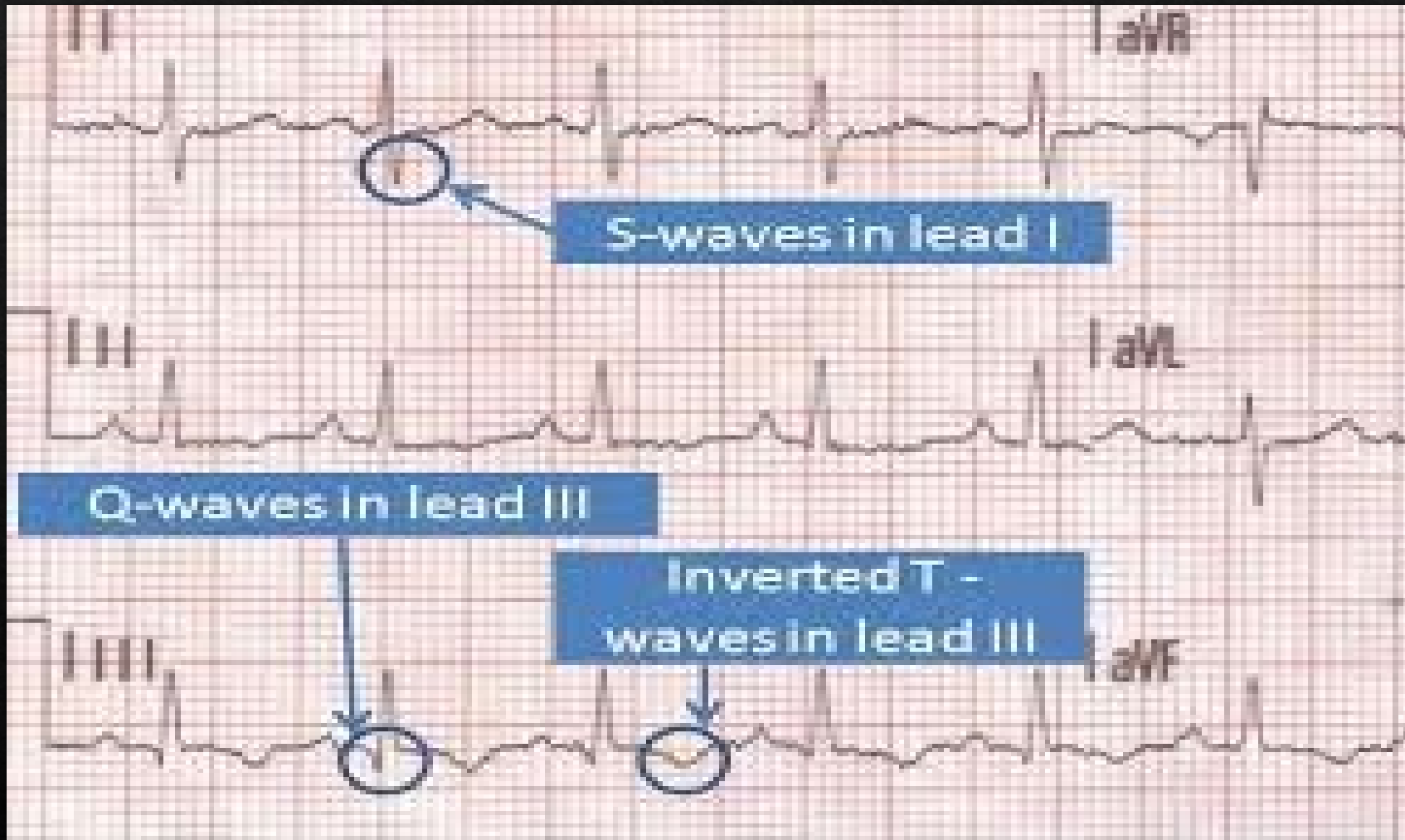
Preexcitation (WPW)



Brugada Syndrome

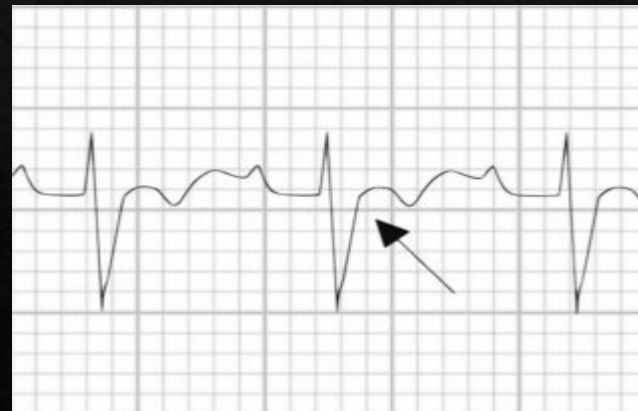
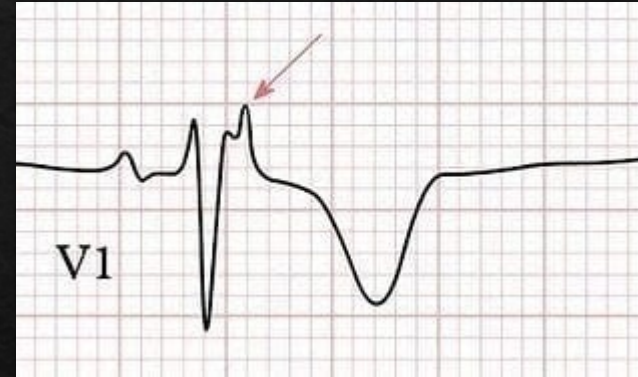


Pulmonary Embolism

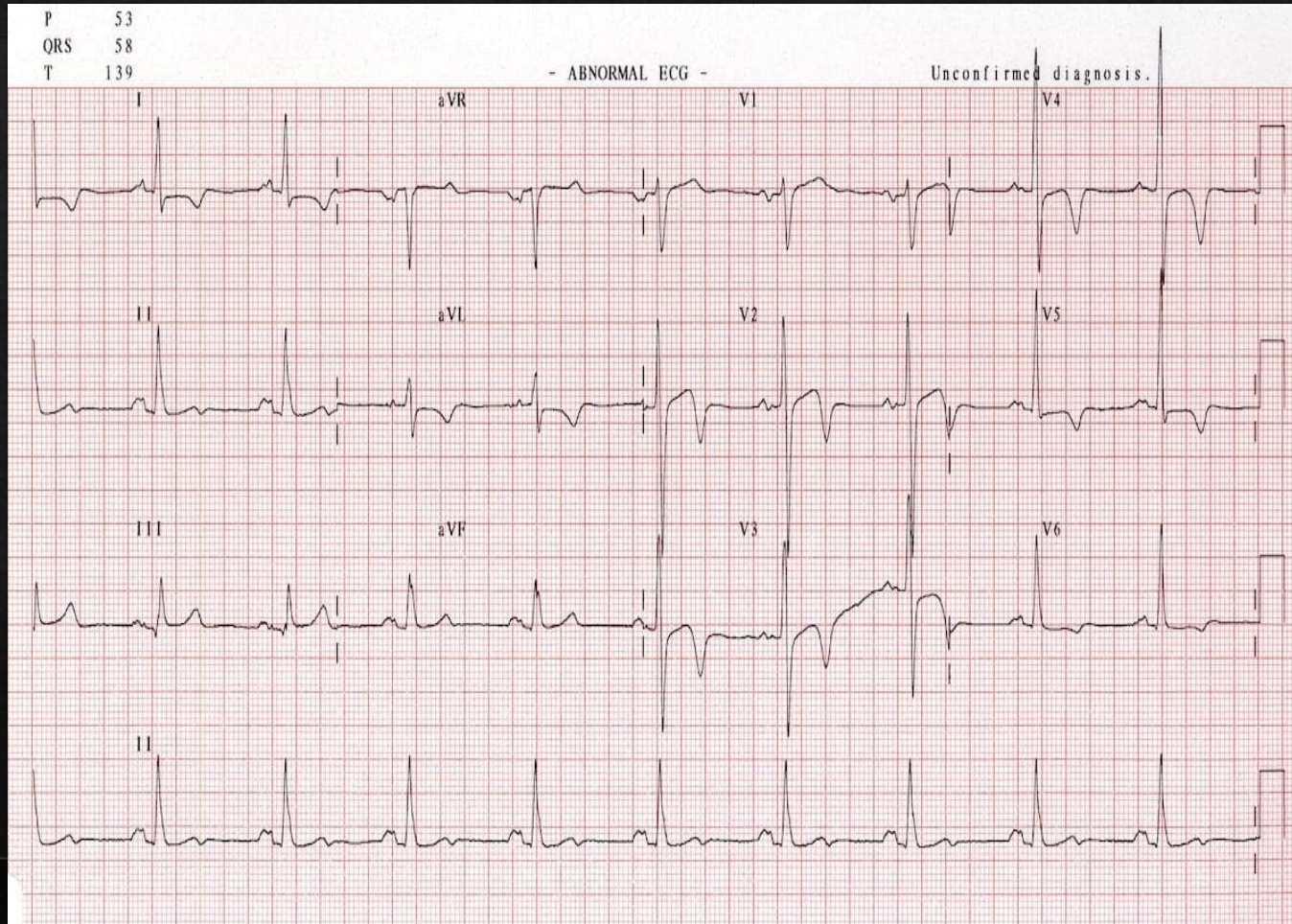


Arrhythmogenic RV Cardiomyopathy

- ◇ T wave inversion in right precordial leads V1-3, in absence of RBBB (85% of patients)
- ◇ Epsilon wave (most specific finding, seen in 50% of patients)
- ◇ Localised QRS widening in V1-3 (> 110ms)
- ◇ Prolonged S wave upstroke of 55ms in V1-3
- ◇ Ventricular ectopy of LBBB morphology, with frequent PVCs > 1000 per 24 hours
- ◇ Paroxysmal episodes of ventricular tachycardia (VT) with LBBB morphology (RVOT tachycardia)

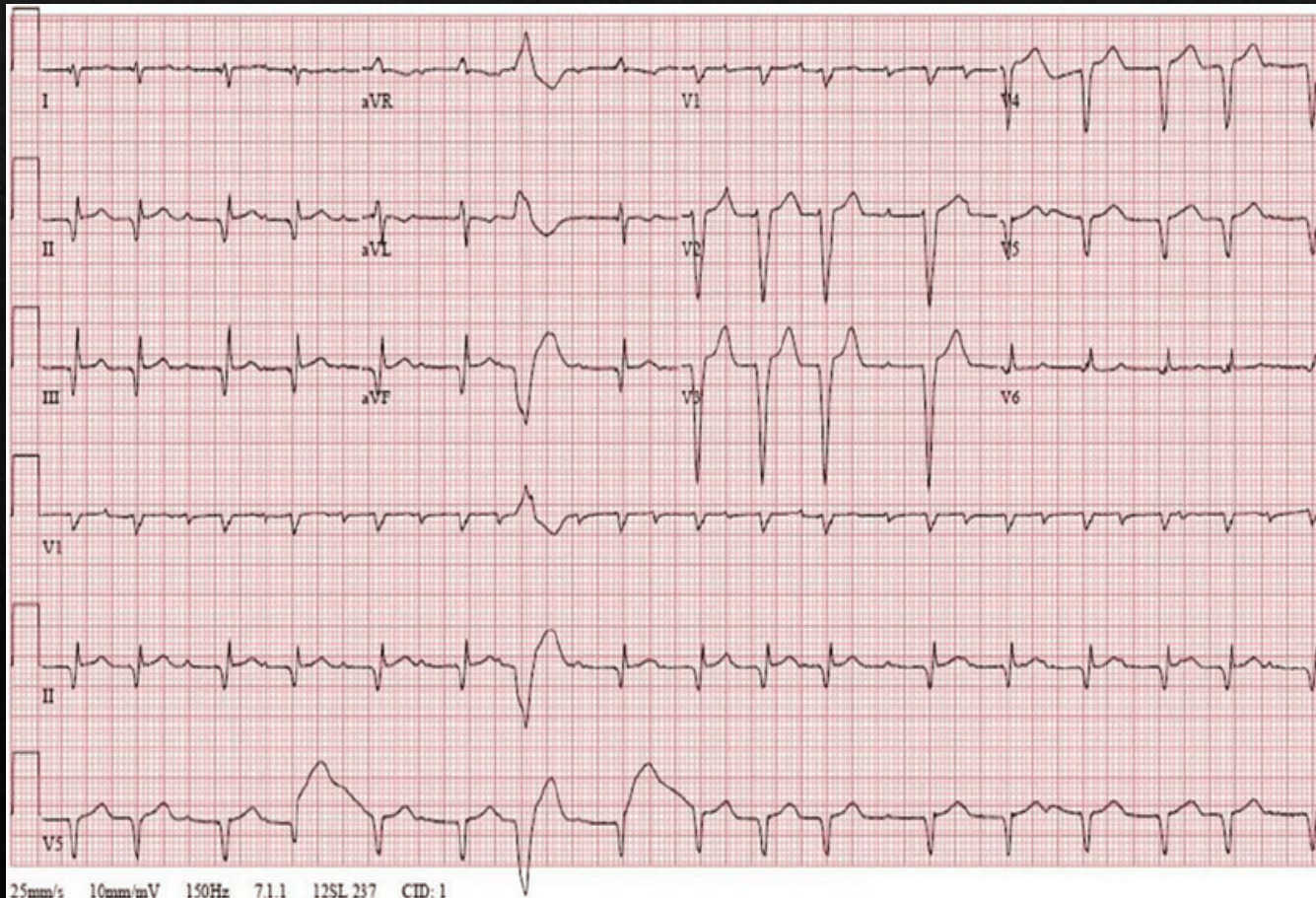


Hypertrophic Cardiomyopathy



- ◇ LVH
- ◇ Increased precordial voltages, non-specific ST segment and T-wave abnormalities
- ◇ Deep narrow dagger like Q waves in lateral and inferior leads

Dilated Cardiomyopathy



- ◇ Atrial and ventricular hypertrophy
- ◇ Interventricular conduction delays such as LBBB
- ◇ Abnormal Q waves may be present in V1-V4 (pseudoinfarction)
- ◇ May see reduced voltages in diffuse myocardial fibrosis