



I KATEDRA i KLINIKA KARDIOLOGII  
WARSZAWSKIEGO UNIwersYTETU MEDYCZNEGO

# ECG - ischaemia

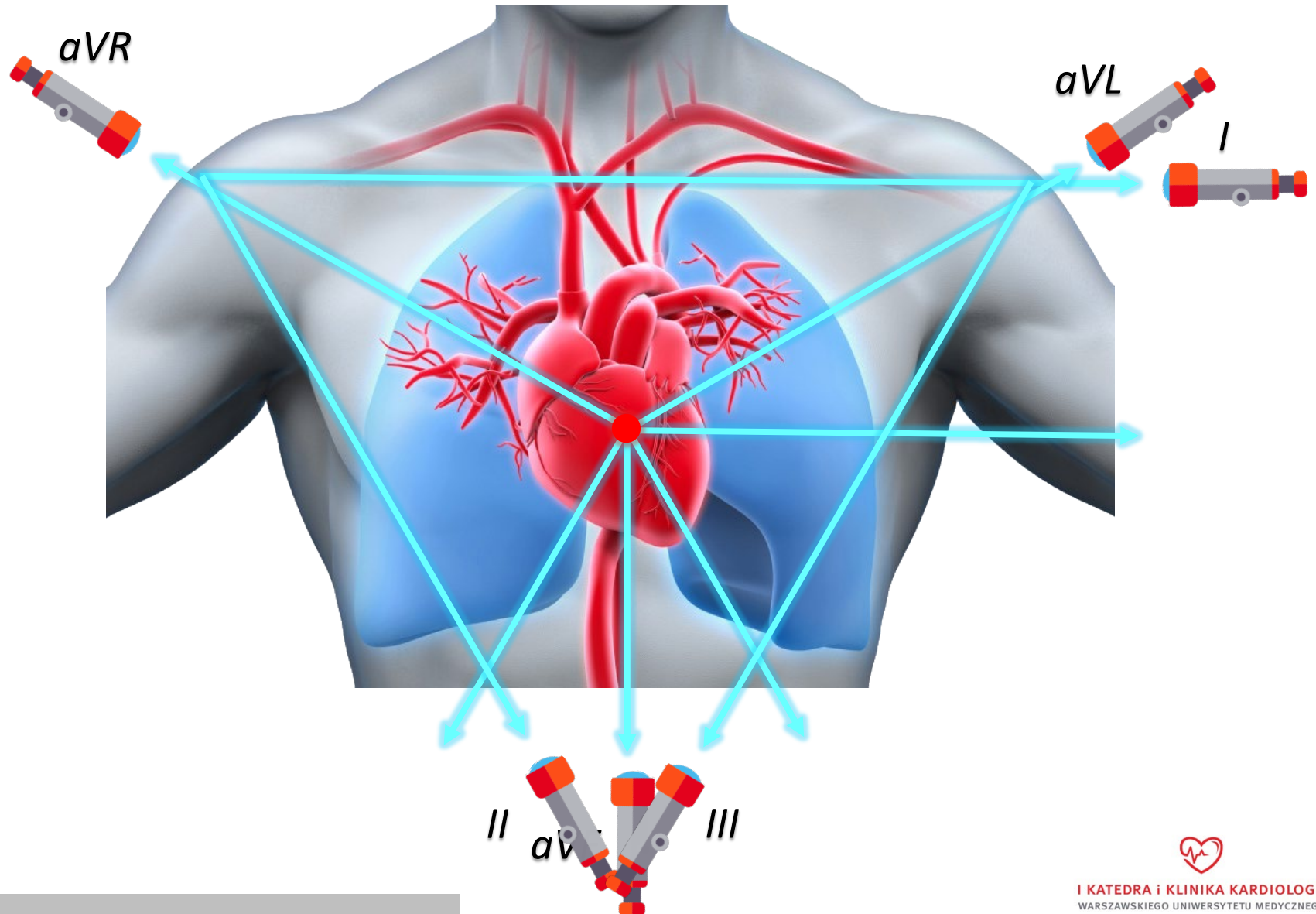
Marek Wawrzacz

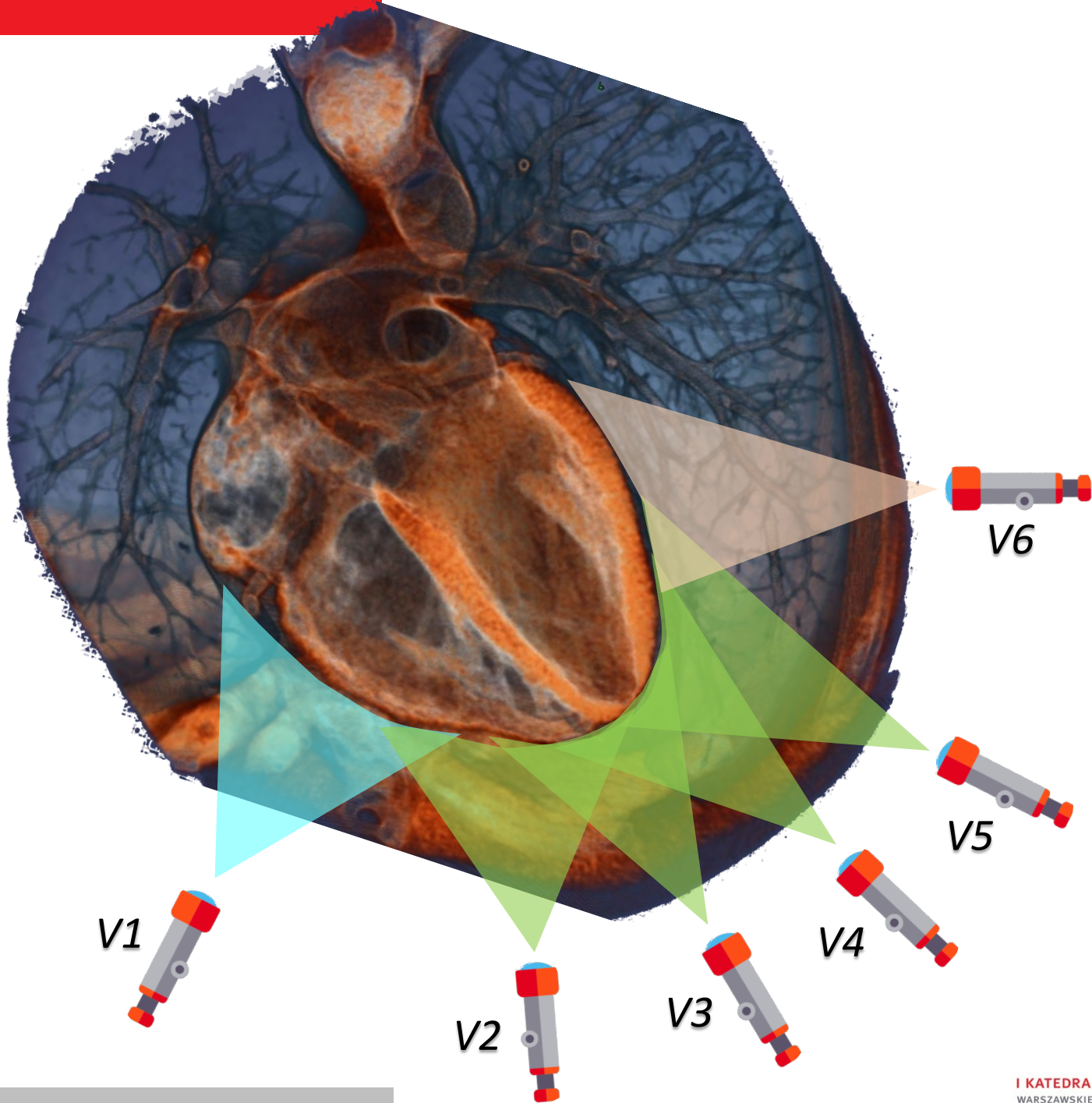
# ECG analysis

- rhythm
- rate
- axis
- AV conduction
- ventricular conduction
- hypertrophy
- ischaemia

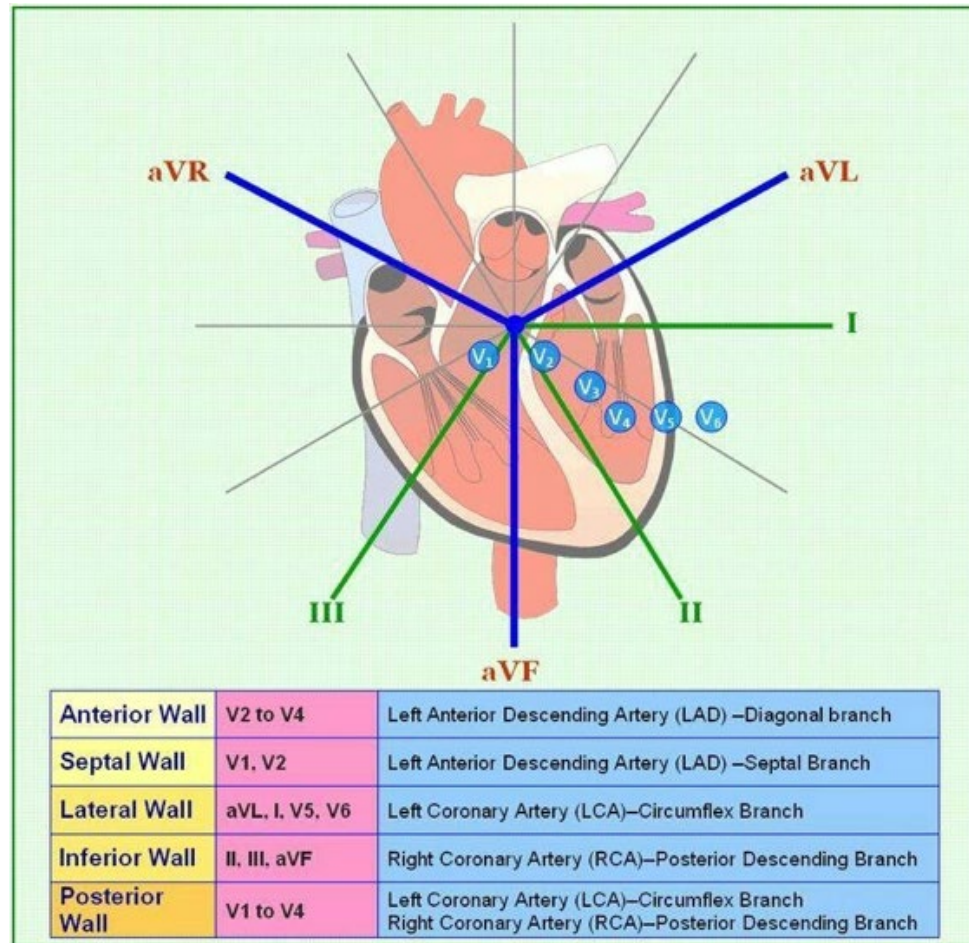


# ECG contiguous limb leads



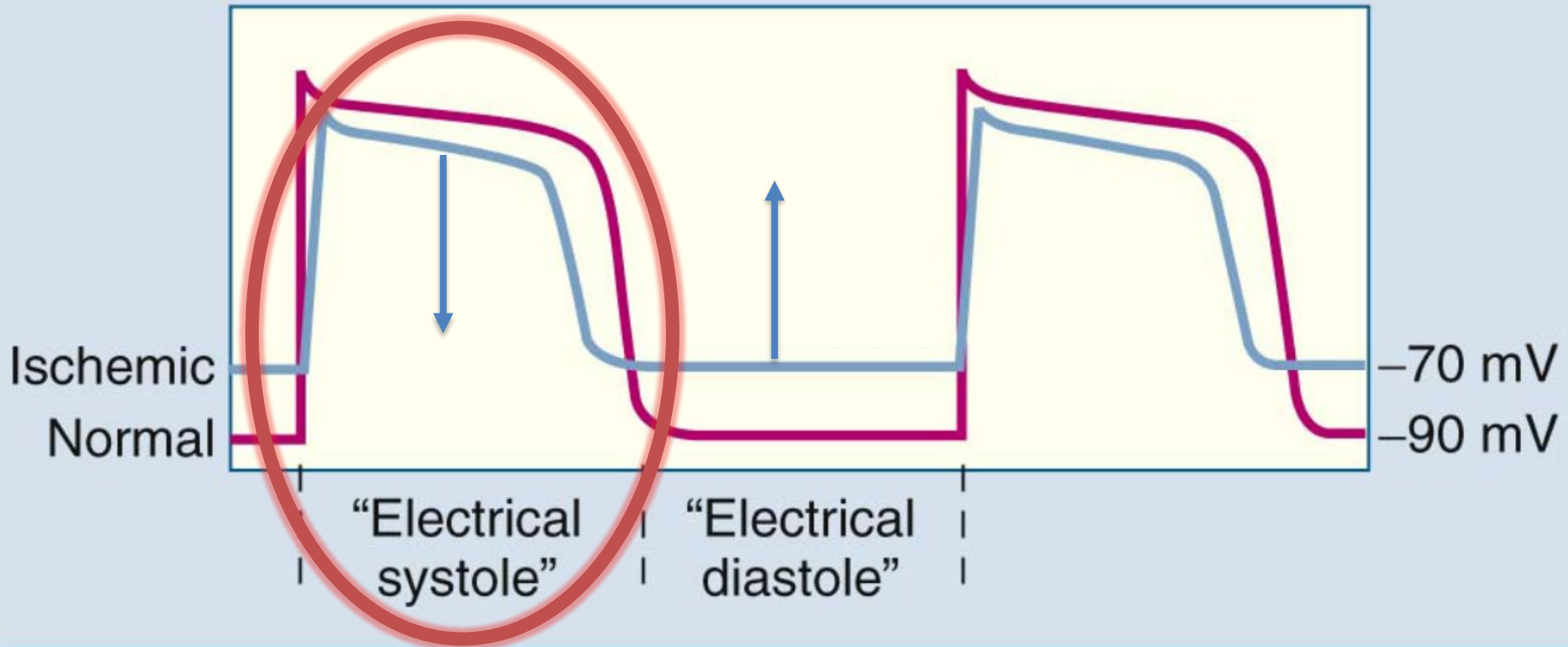


# Contiguous leads





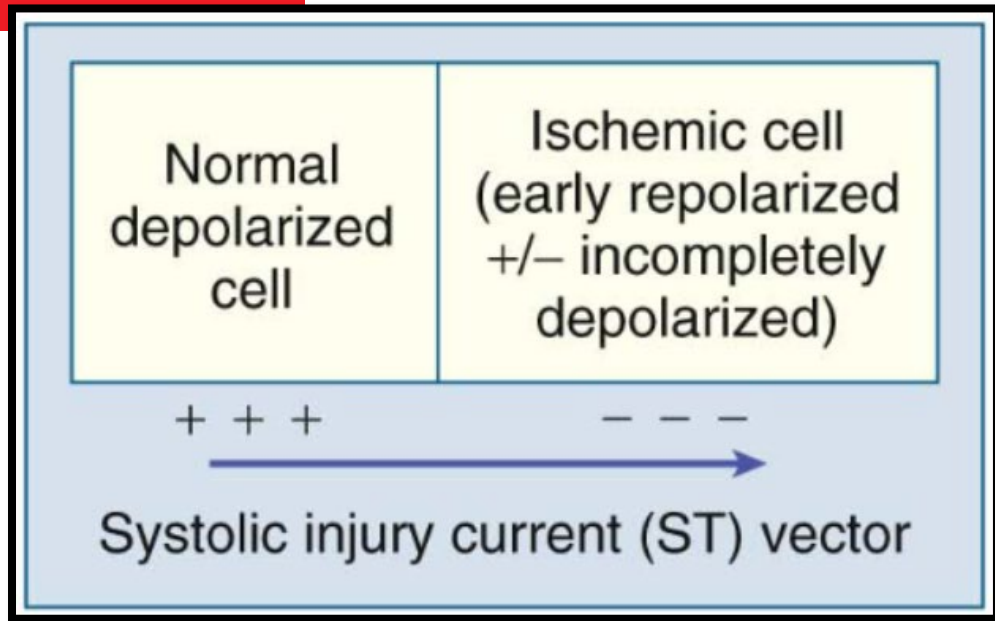
# Action potential during ischemia



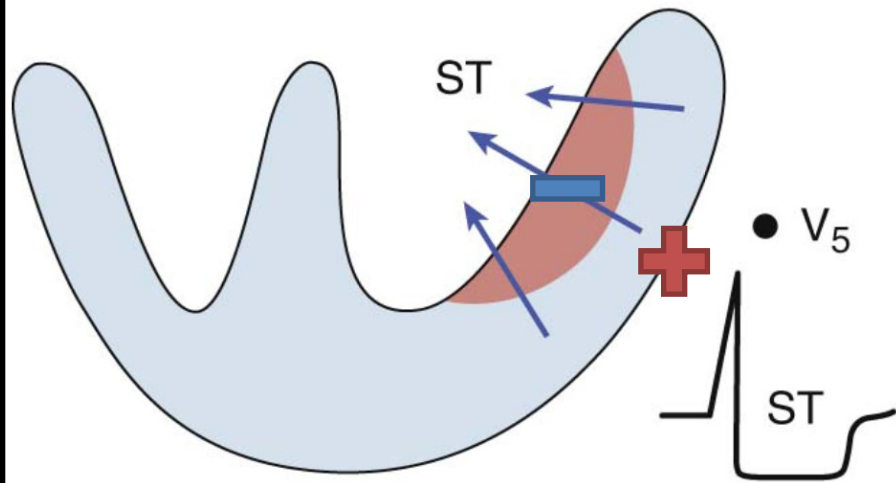
*Tissue normally perfused = normally „positive”*

*Ischemic tissue = pathologically „negative”*

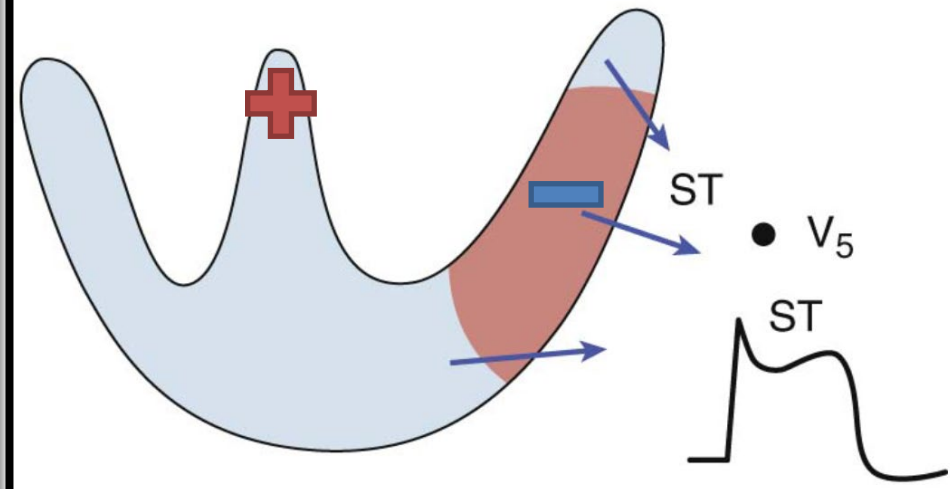




Subendocardial Injury: ST Depression



Transmural (Epicardial) Injury: ST Elevation



# ST elevation

- significant ST elevation (measured in J point):
  - remaining leads
    - men and women  $\geq 0,1$  mV (1 mm);
  - leads V2, V3
    - women  $\geq 0,15$  mV (1,5 mm),
    - men  $\geq 40$  lat  $\geq 0,2$  mV (2 mm),
    - men  $< 40$  lat  $\geq 0,25$  mV (2,5 mm);
- in  $\geq 2$  contiguous leads



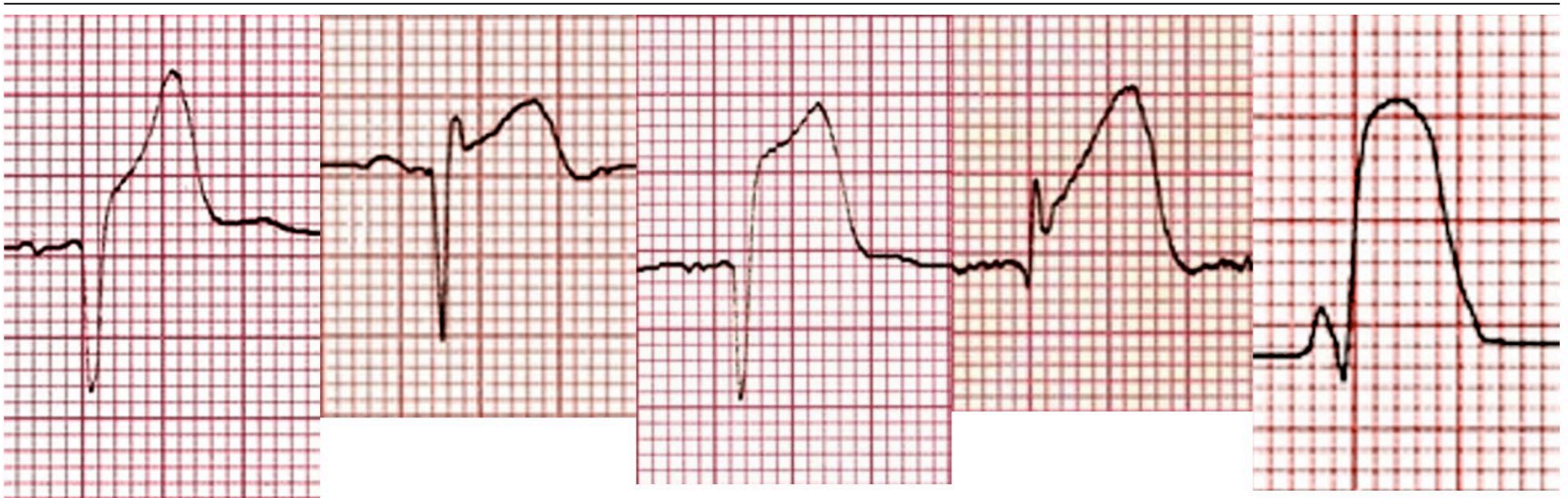


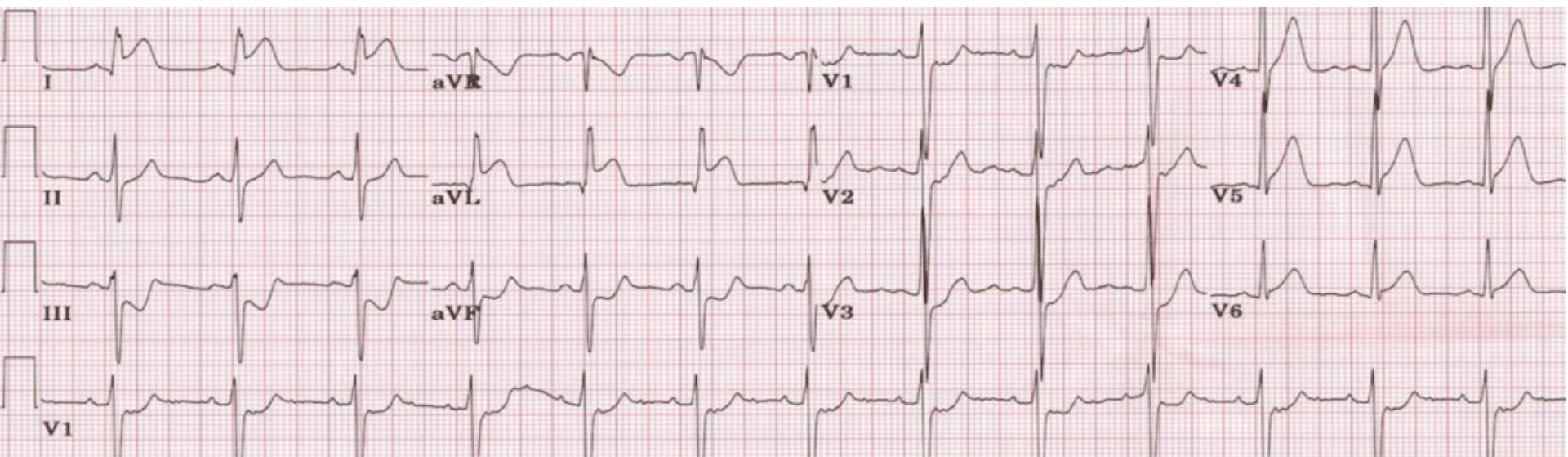
# ST depression

- significant ST depression (measured in J point):
  - leads V2, V3 — men and women  $\geq 0,05$  mV (0,5 mm);
  - remaining leads — men and women  $\geq 0,1$  mV (1 mm)
- in  $\geq 2$  contiguous leads
- persistent

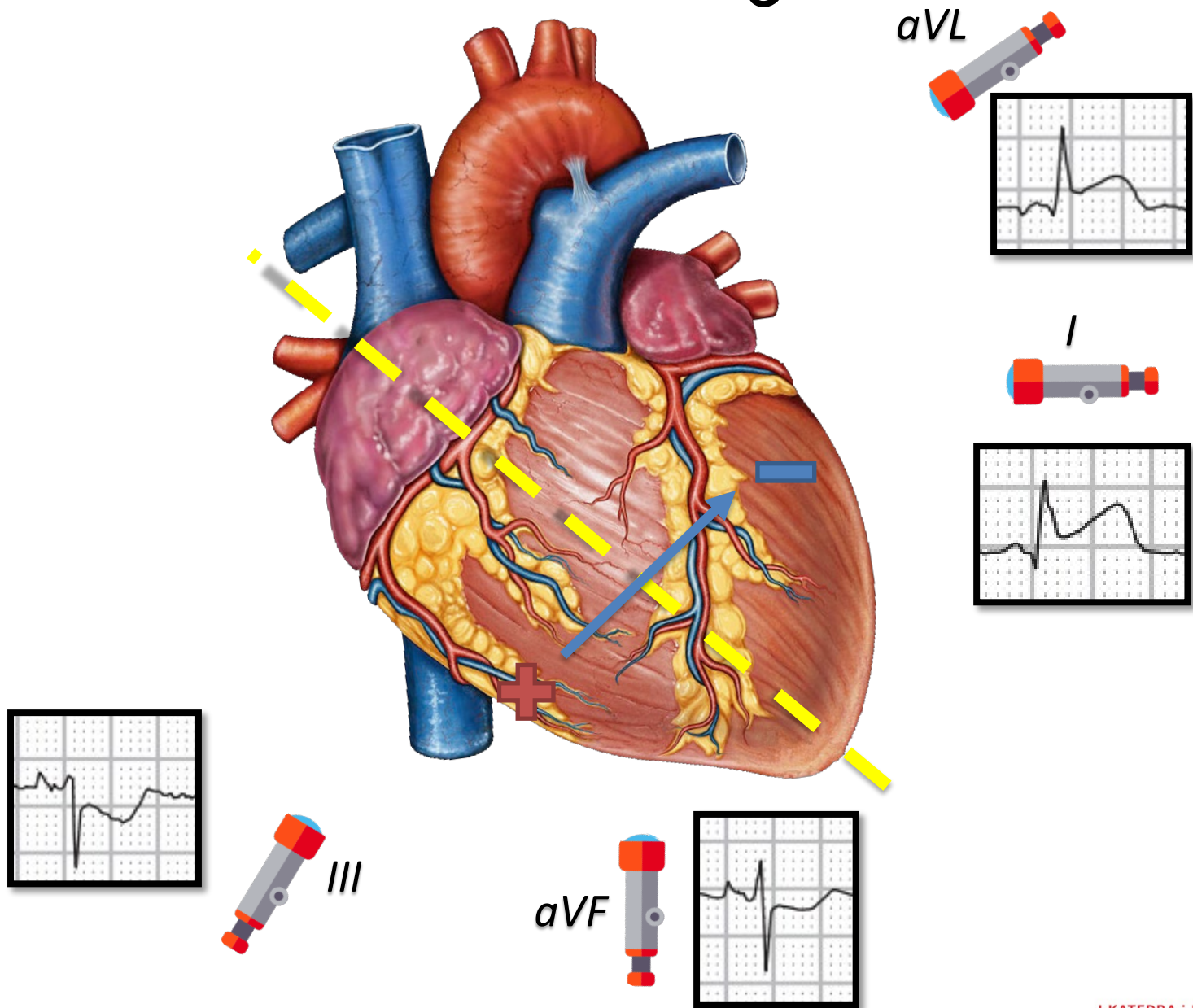


# ST elevation shape

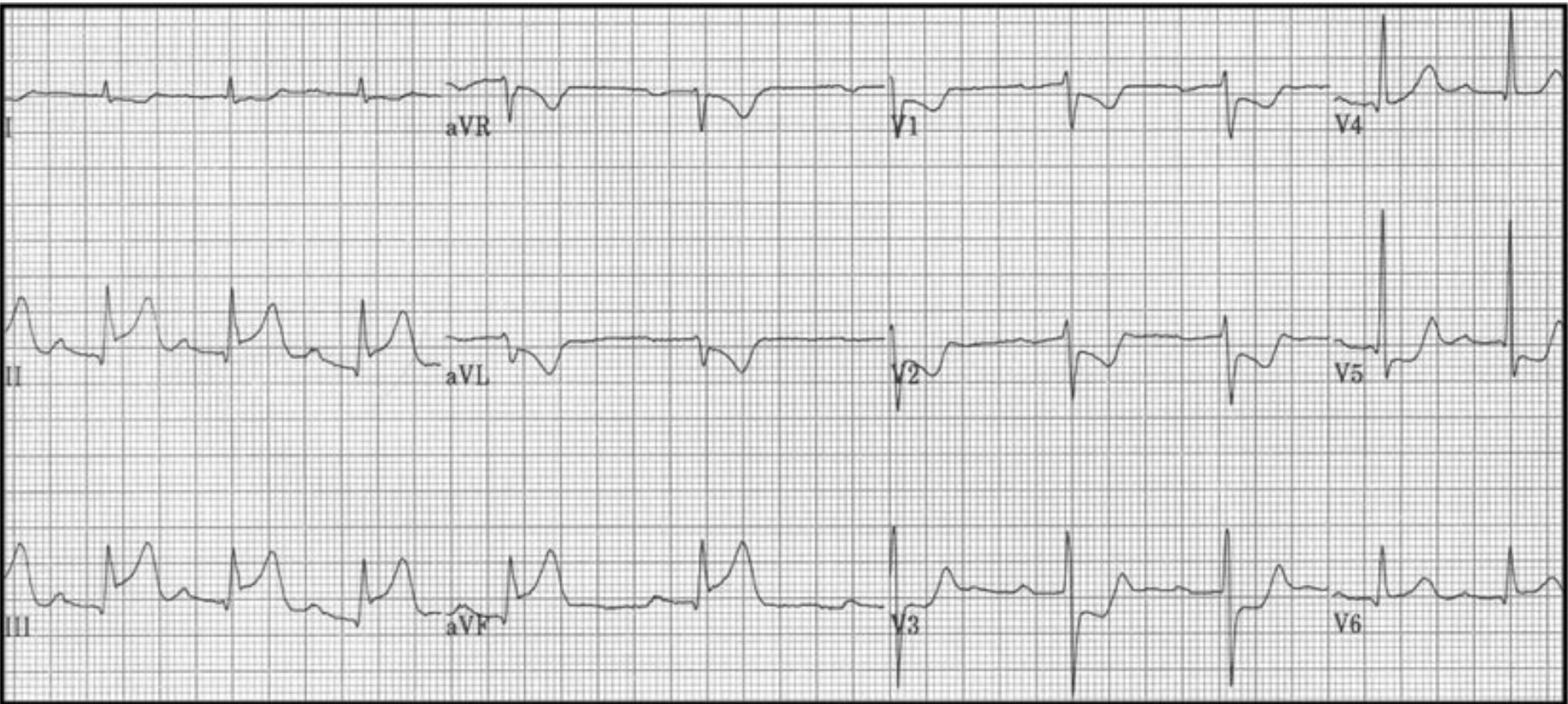


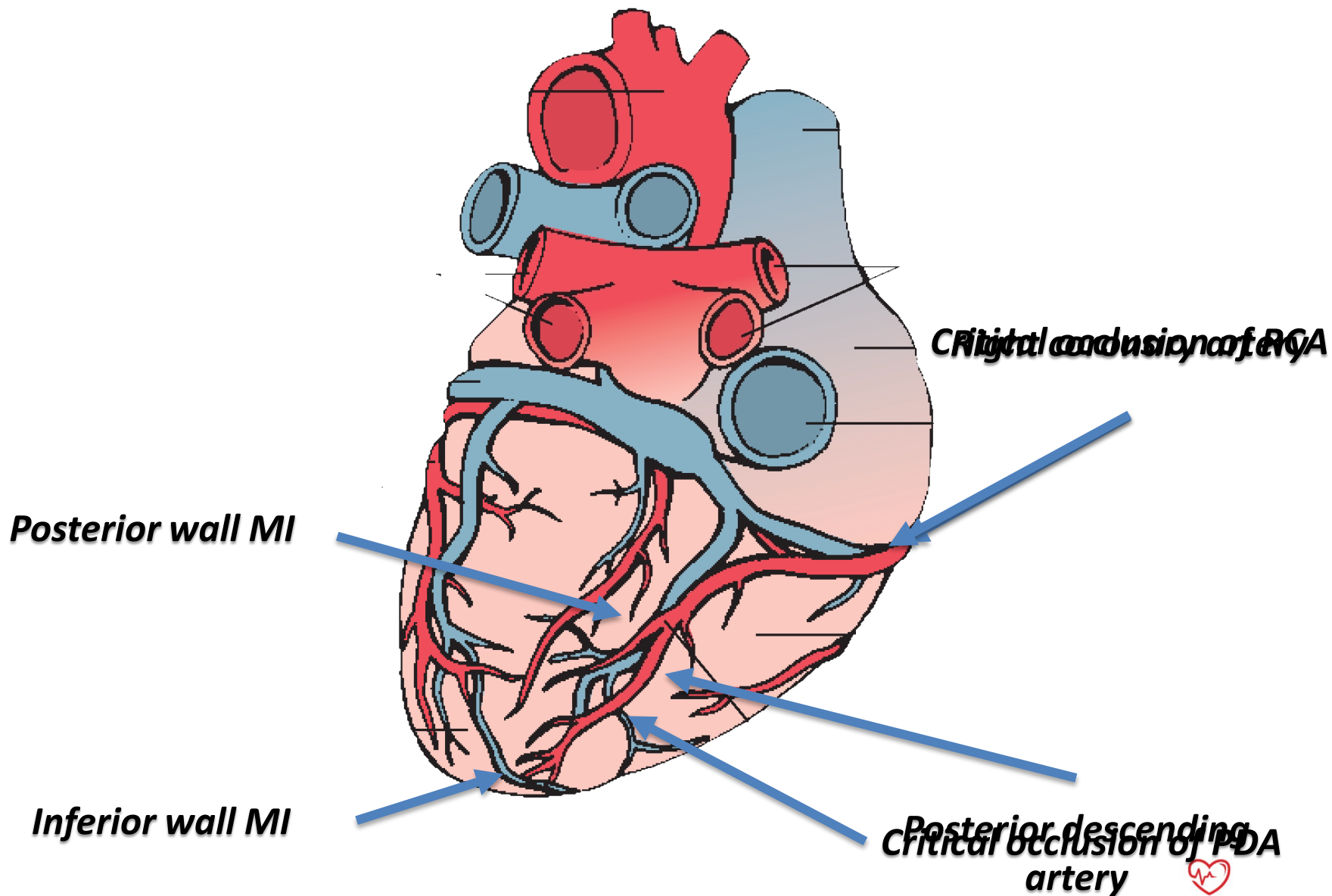


# Mirror image

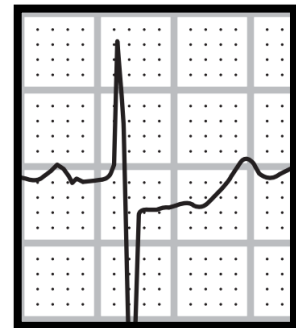
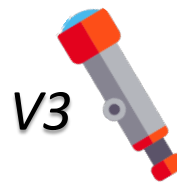
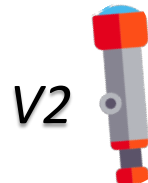
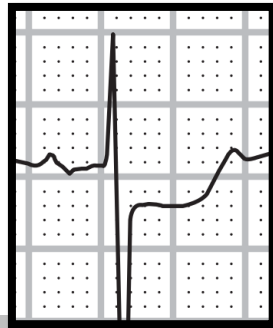
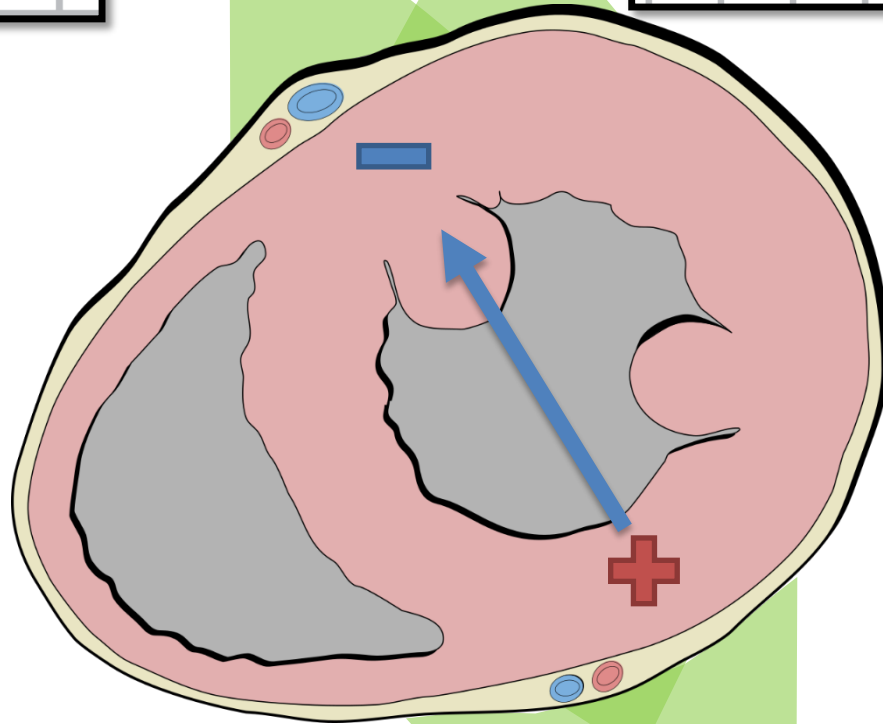
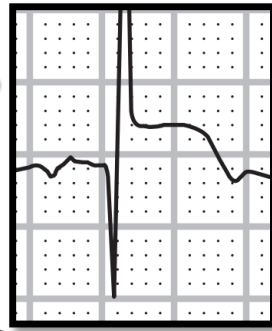
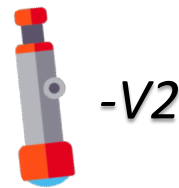
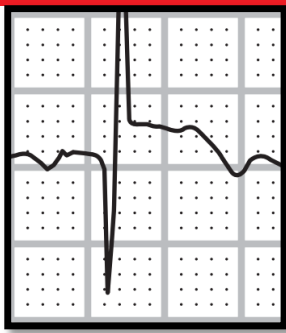


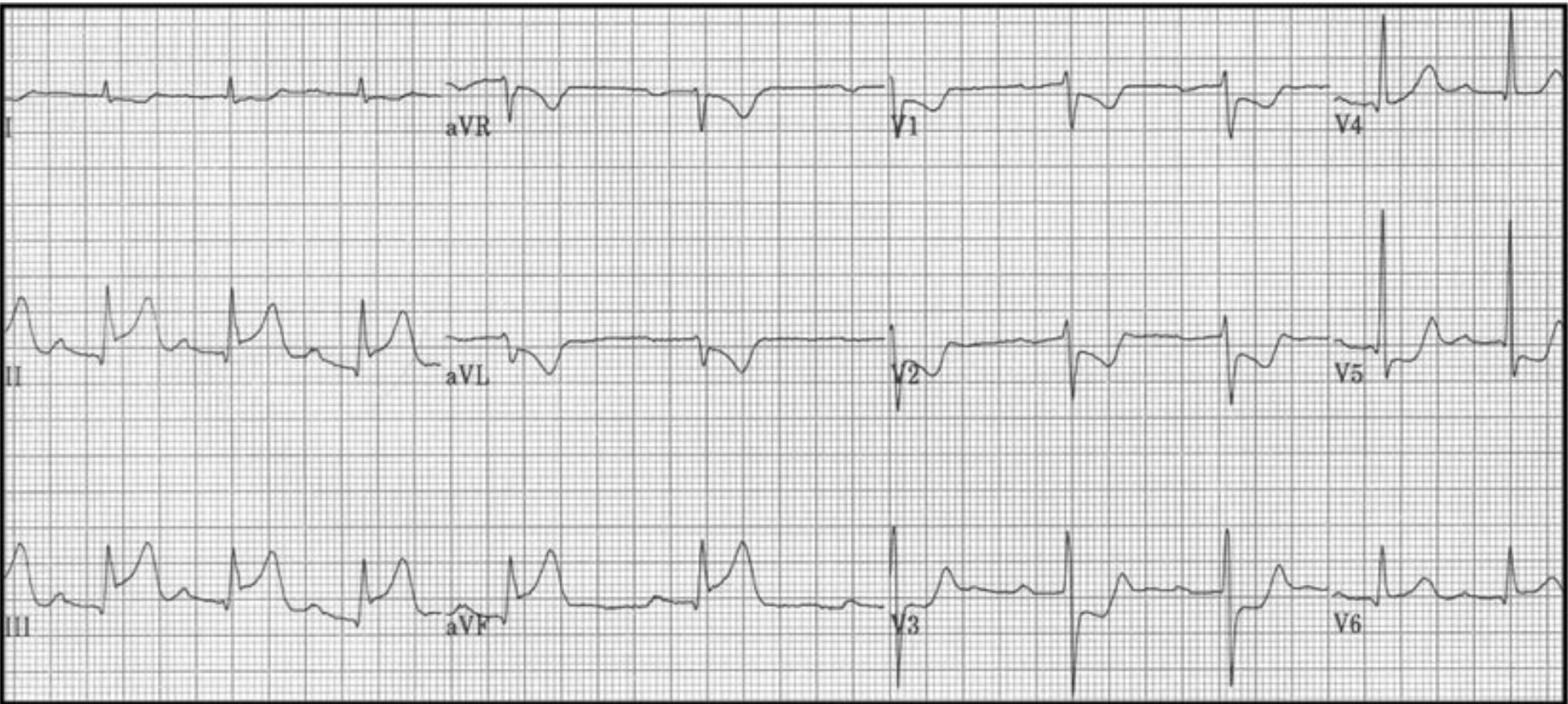


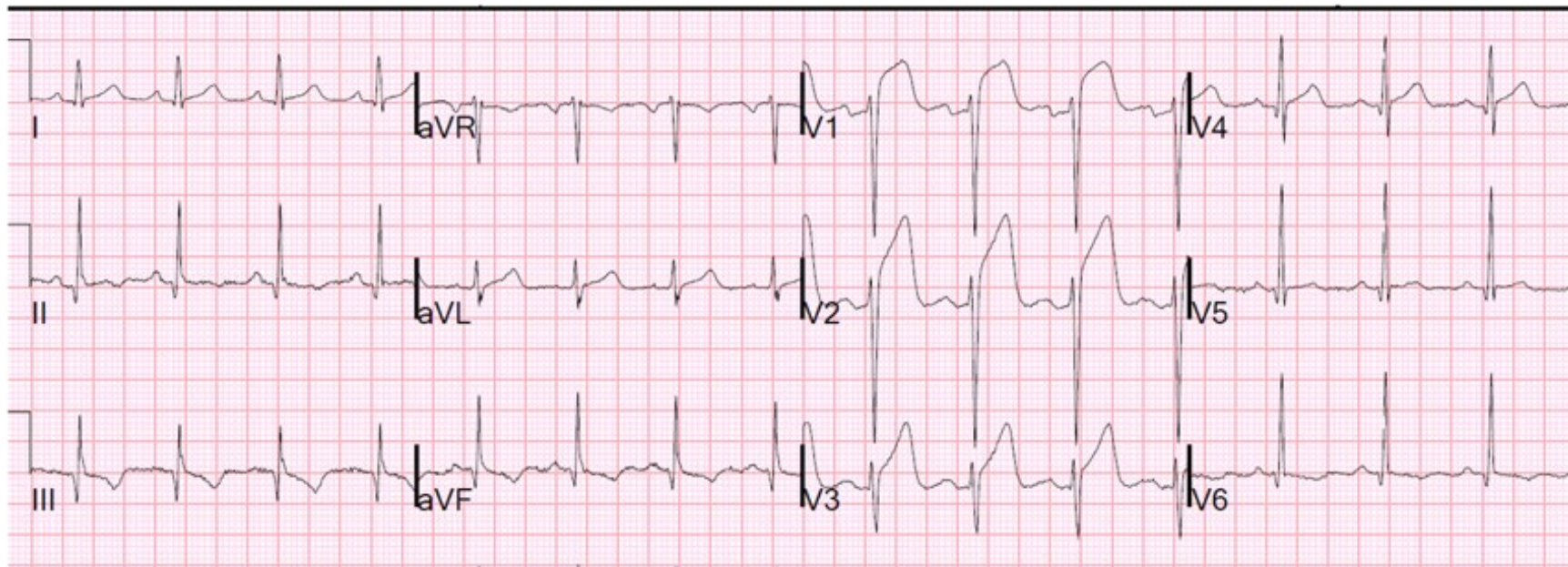




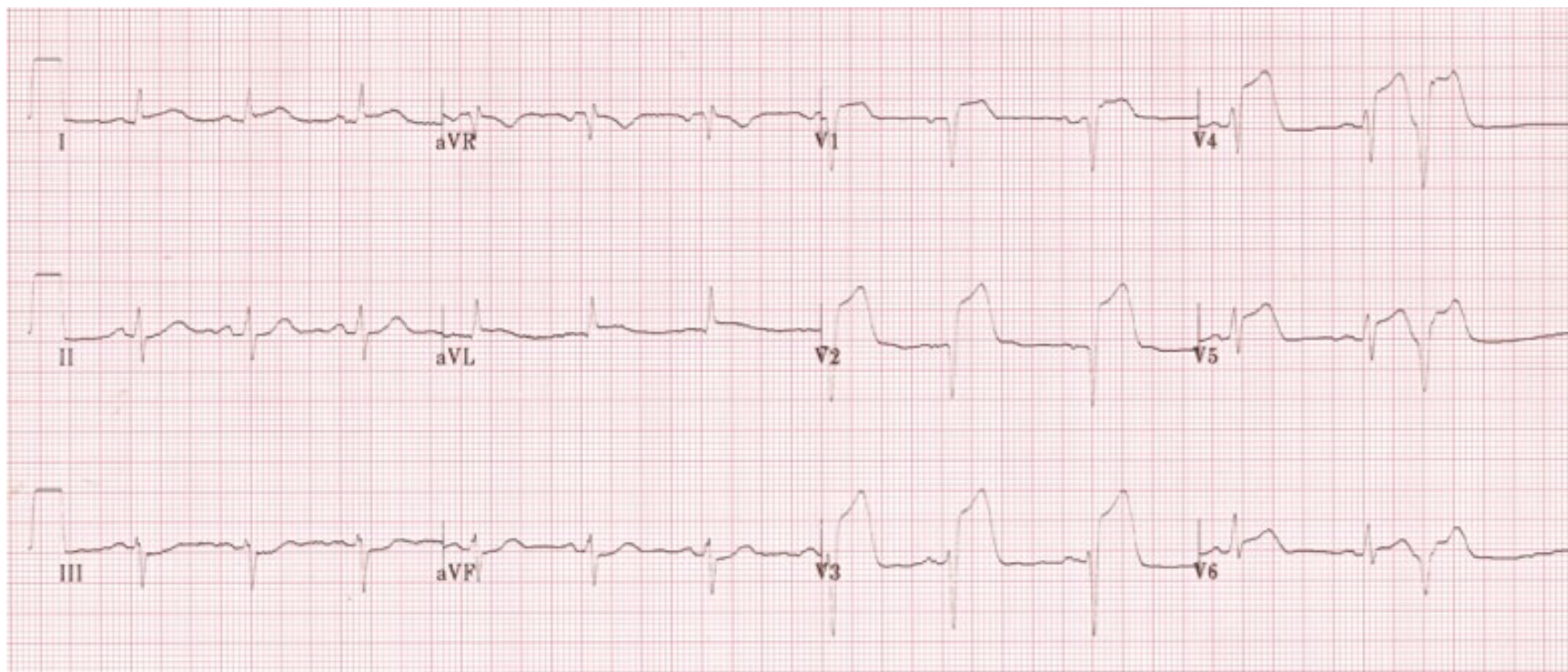


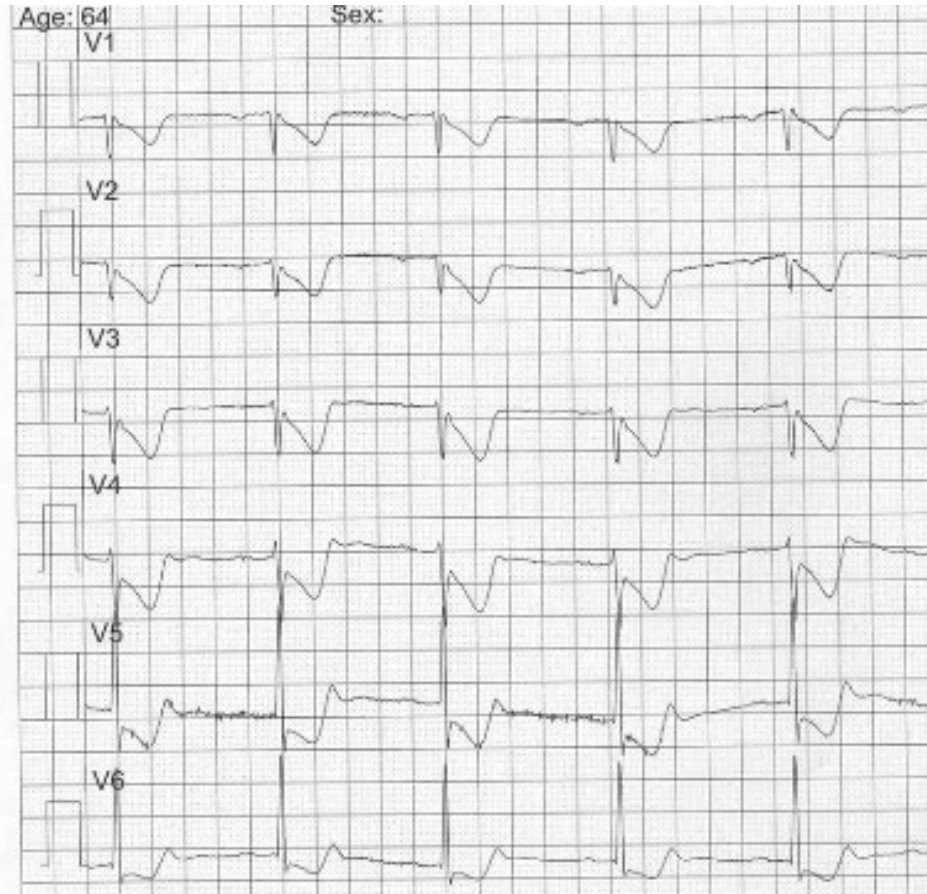
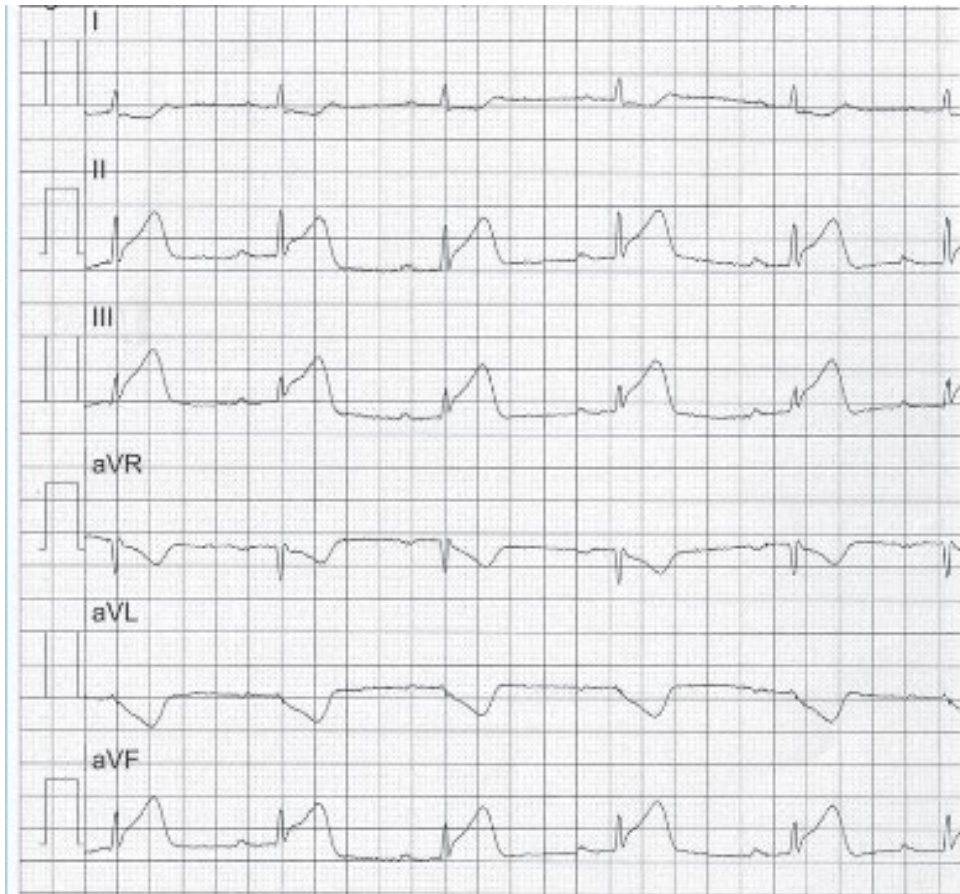


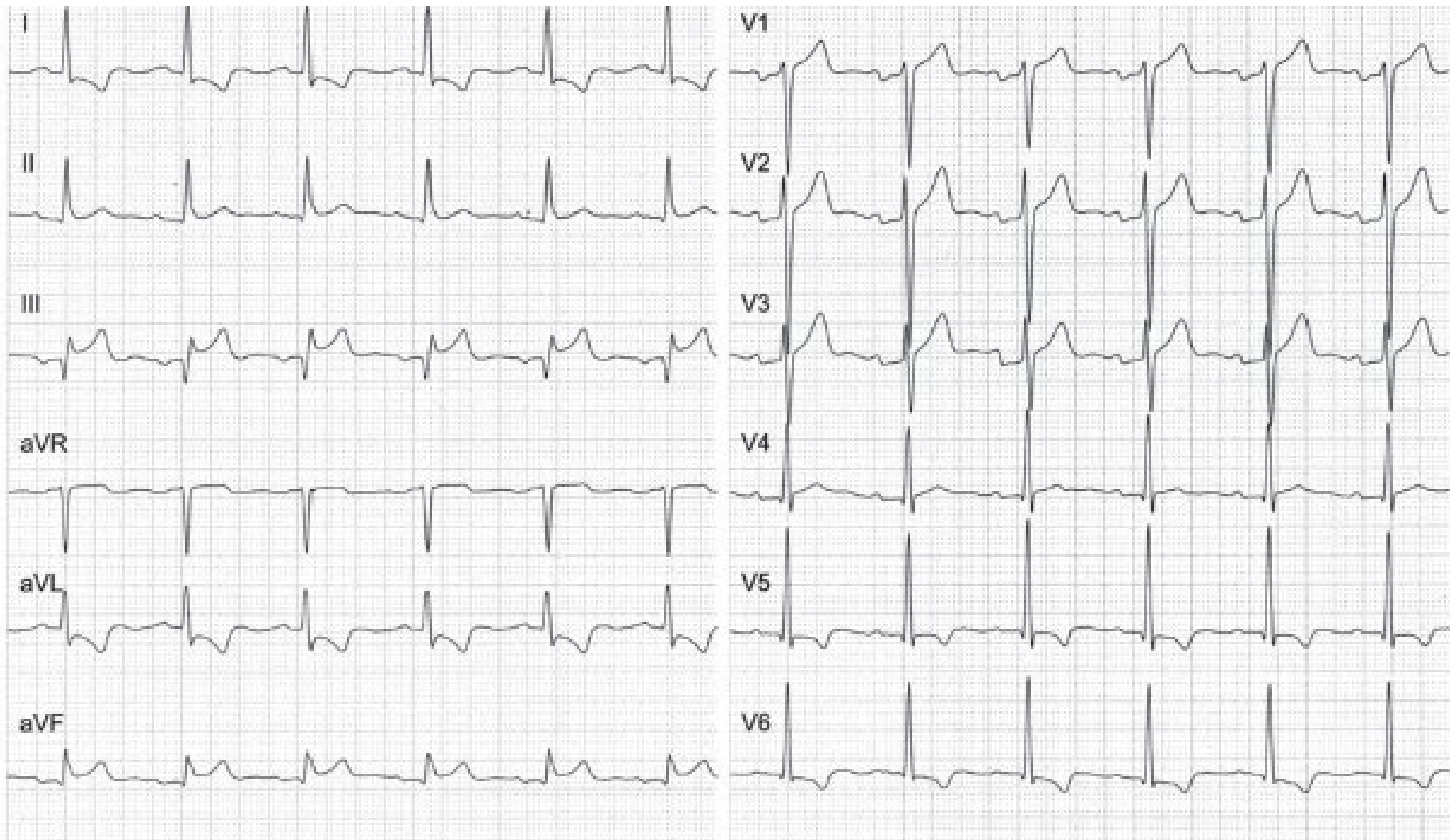




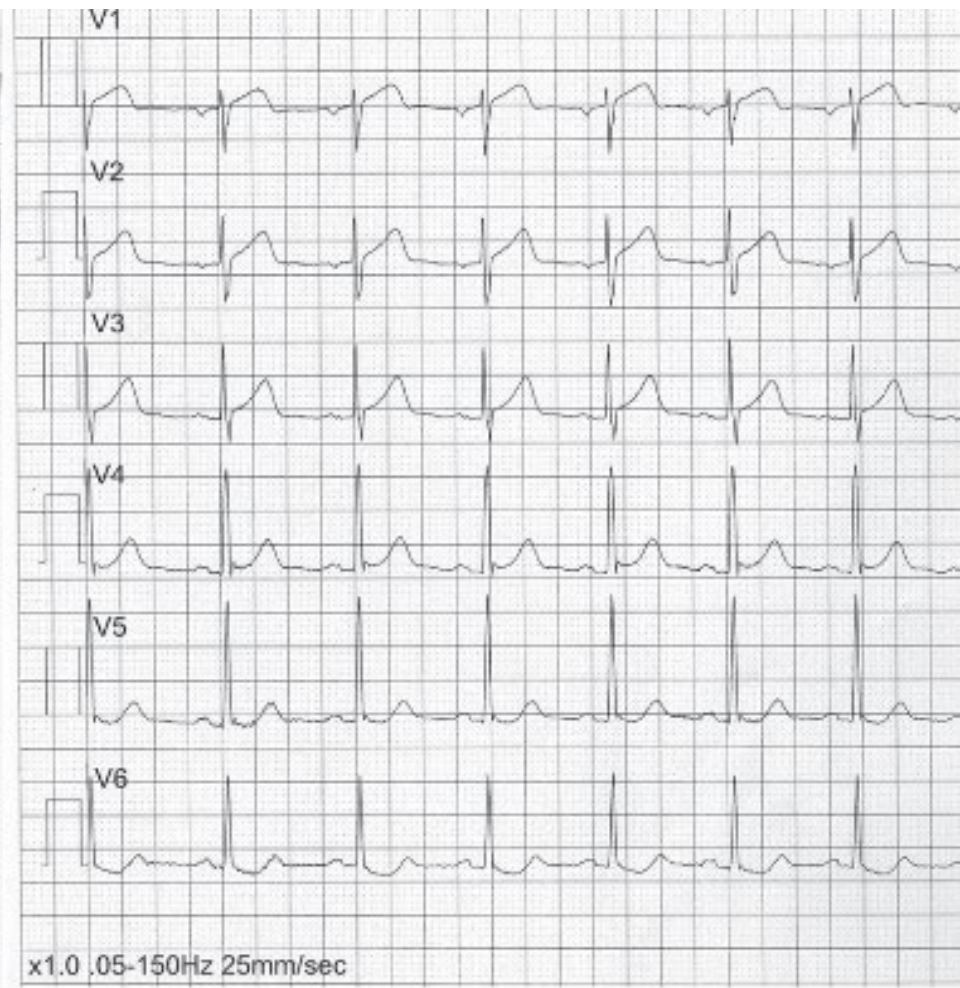
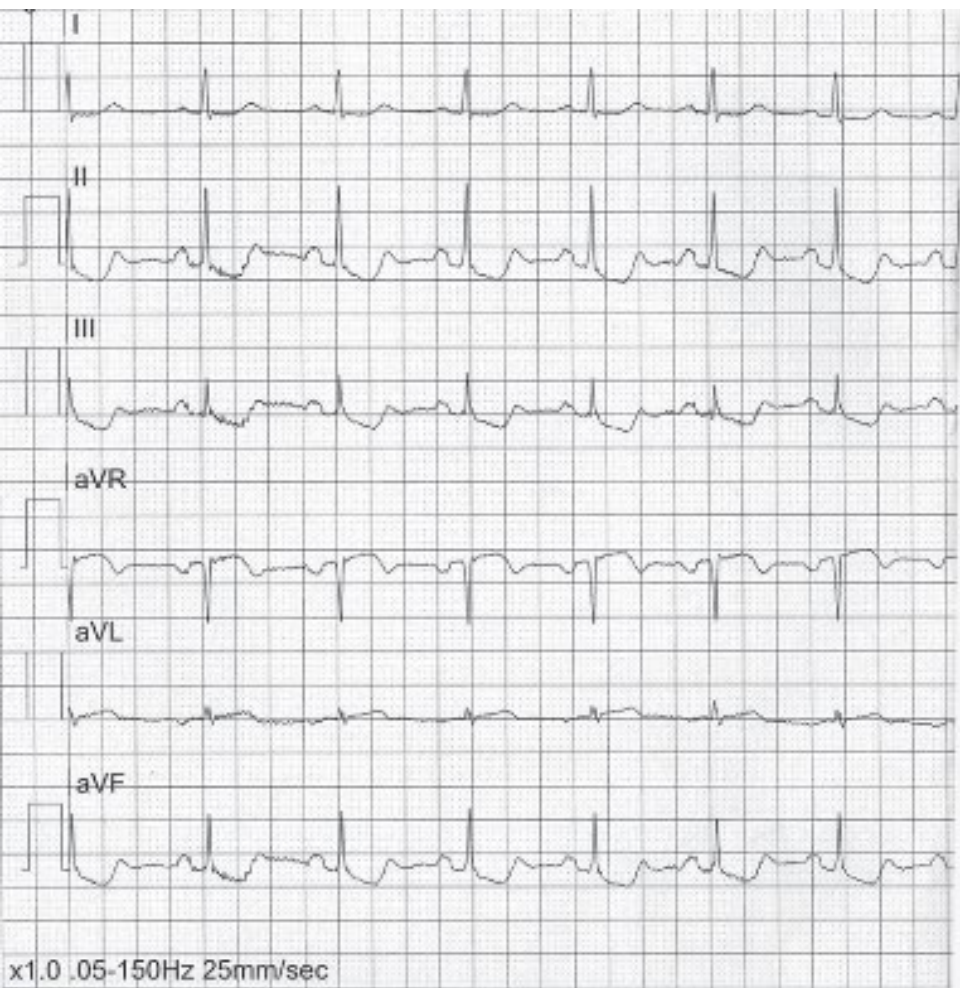


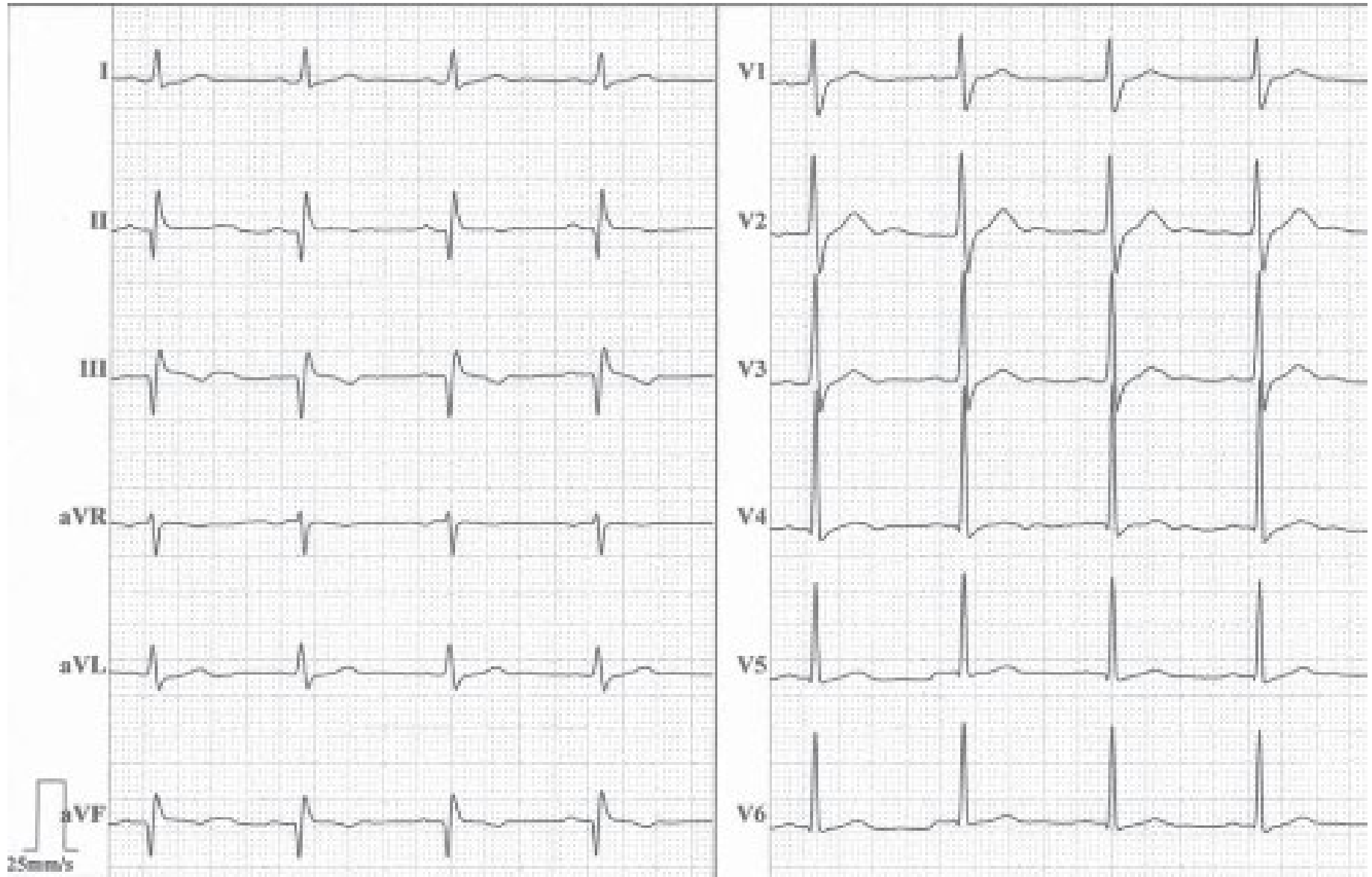












# Pathological Q Waves

*Pathological Q waves usually indicate current or **prior myocardial infarction**.*

Q waves are considered pathological if:

- > 30 ms wide
- > 1 mm deep



