Cardiology ECG Tips for the ER

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January 15th 2026 and February 18th 2026

Objectives

- Part 1
  - Arrhythmia review of ECG – common encounters
  - Sequelae of arrhythmia seen in ER

- Part 2
  - ACS
    - ECG interpretation
    - Post intervention ECG interpretation

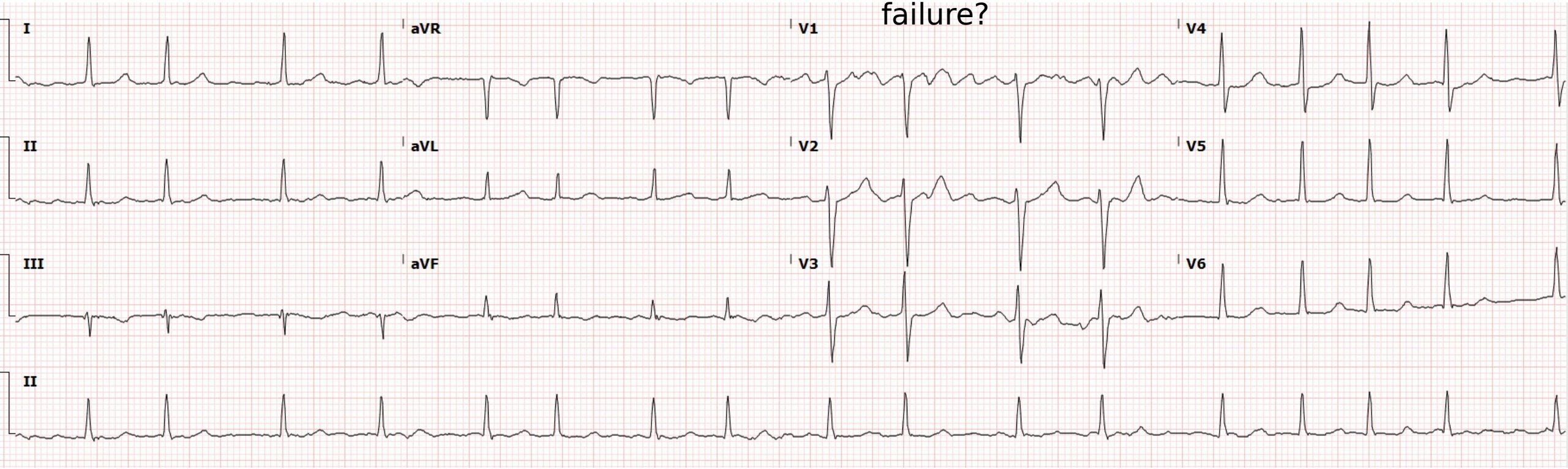
Arrhythmia

- Tachyarrhythmia
  - Narrow complex tachycardia
  - Wide complex tachycardia
- Bradyarrhythmia
  - AV conduction delay

- How does patient look
  - Stable/unstable
- Get a good history to know what symptoms are present
- Do they have known cardiac hx
- What medications are they on
- What associated medical conditions – Hb, TSH, systemic illness

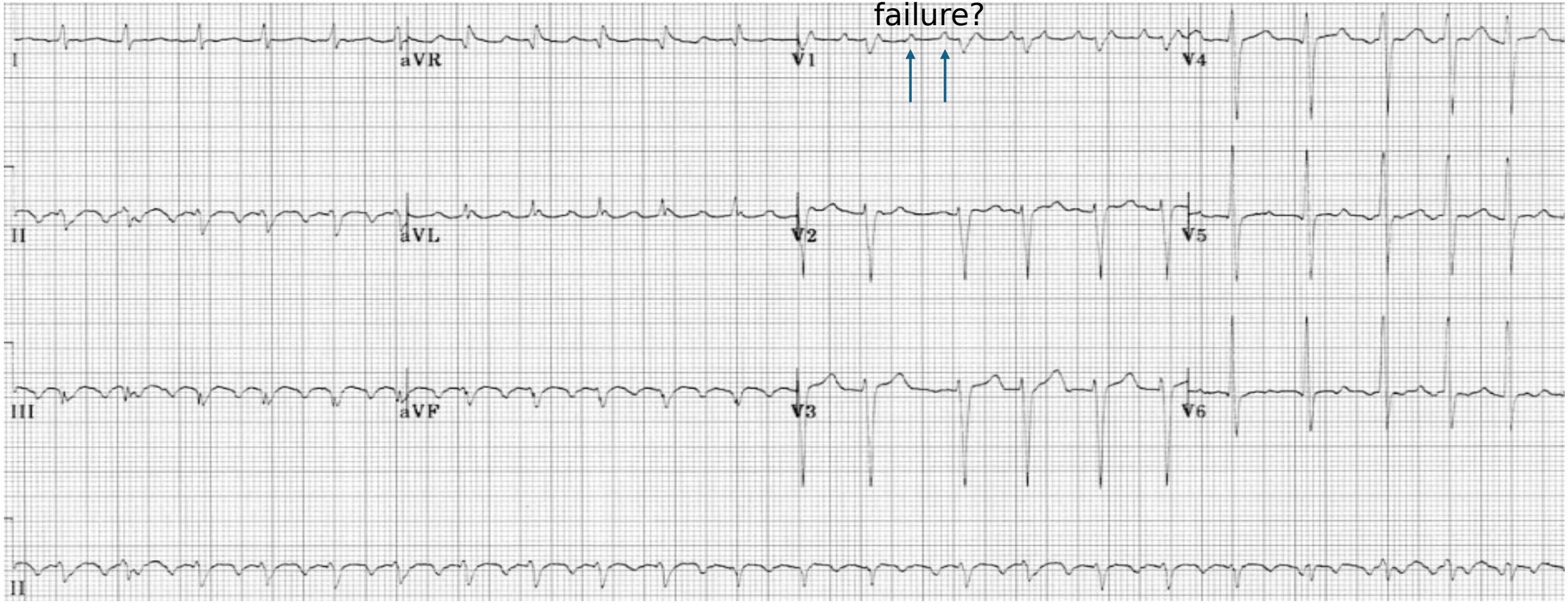
AF

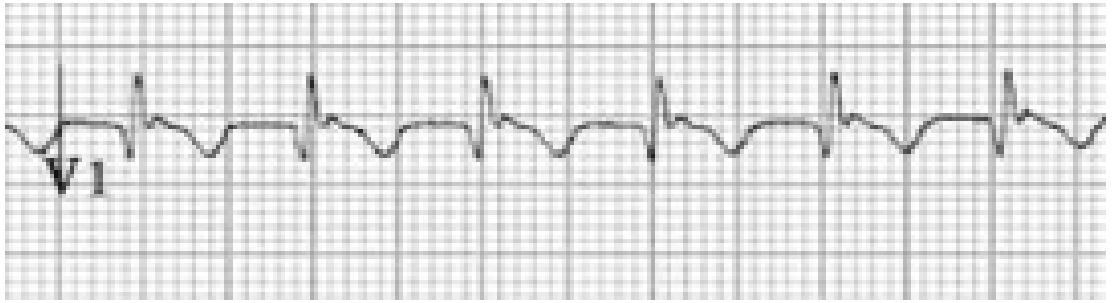
- CHA2DS2-VASc Score
- Rate control vs rhythm control
- Any triggers (Alcohol, OSA, TSH, CAD)
- What is the LVEF and are they in heart failure?



Atrial flutter

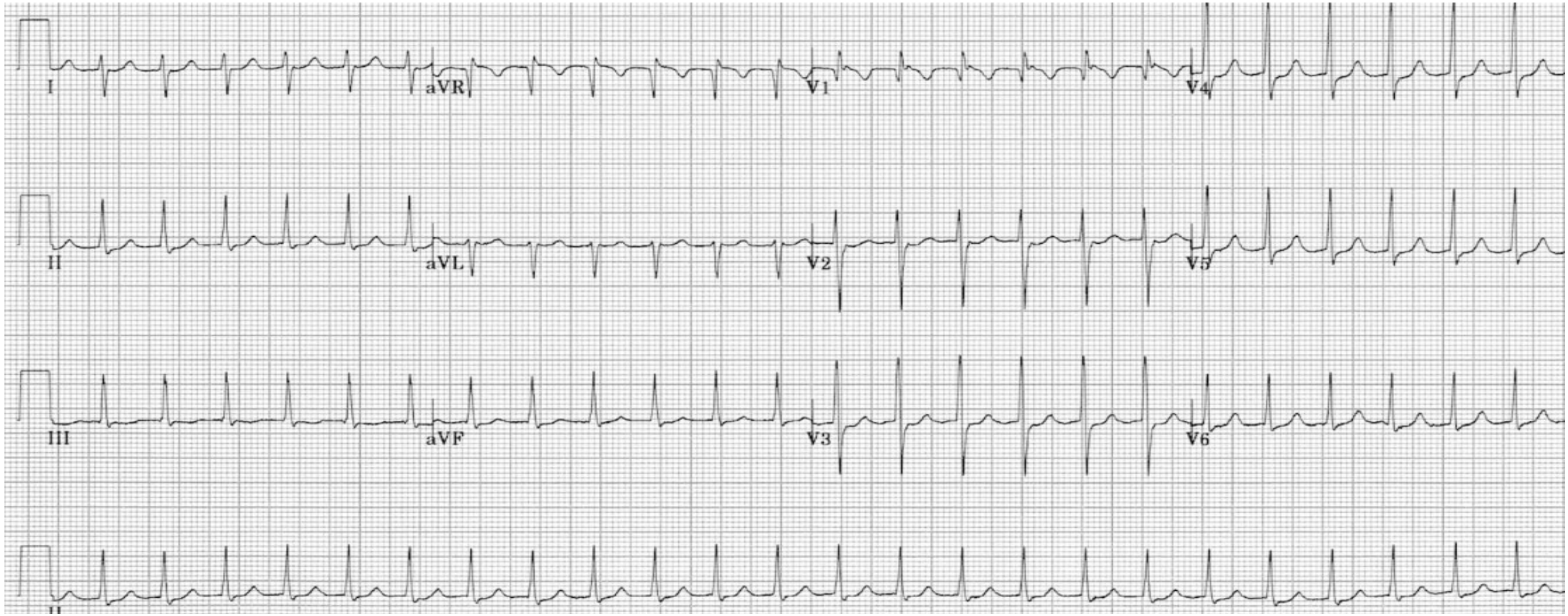
- CHA2DS2-VASc Score
- Rhythm control ***
- Any triggers (Alcohol, OSA, TSH, CAD)
- What is the LVEF and are they in heart failure?





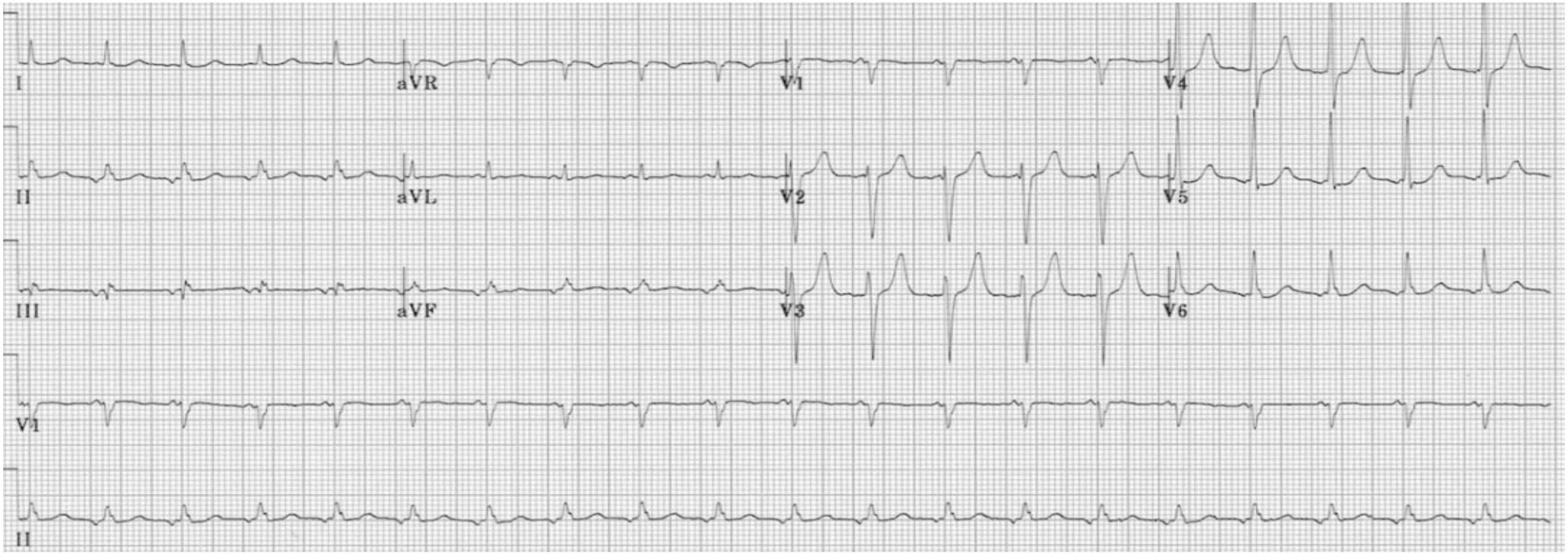
SVT (likely SVNRT)

- Rate control vs rhythm control
- Any triggers



Atrial Tachycardia

- No need for blood thinners
- Rate control vs rhythm control
- What is the LVEF and are they in heart failure?



Narrow Complex Tachycardia

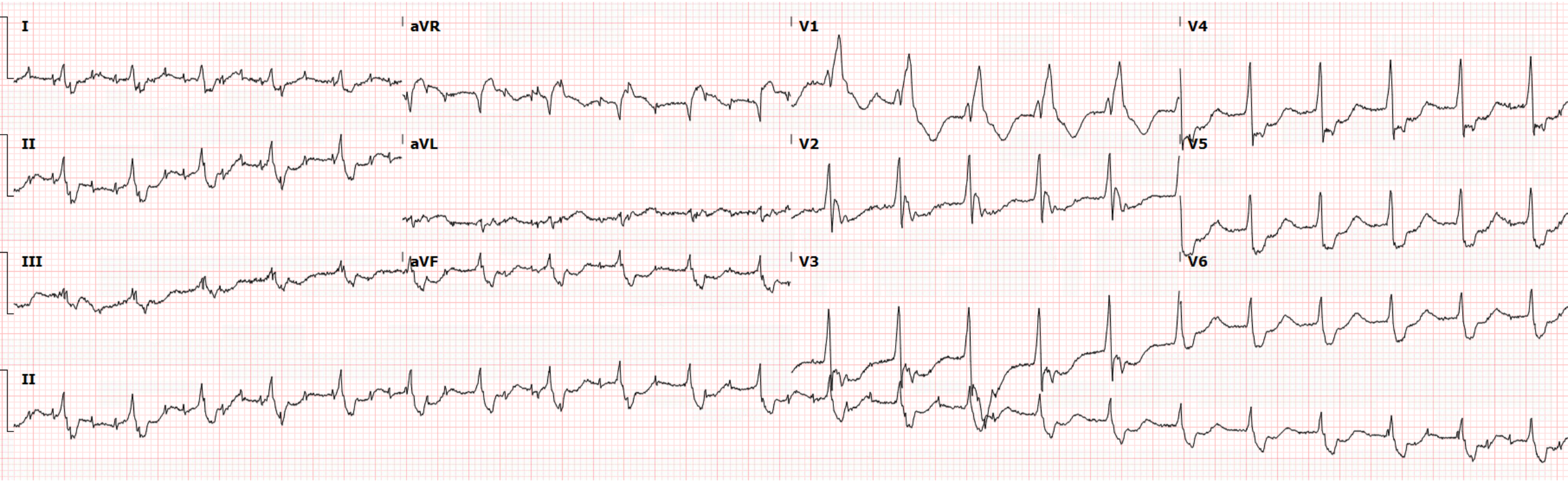
Regular

- Sinus tachycardia
- Atrial flutter
- AVNRT
- Atrial tachycardia

Irregular

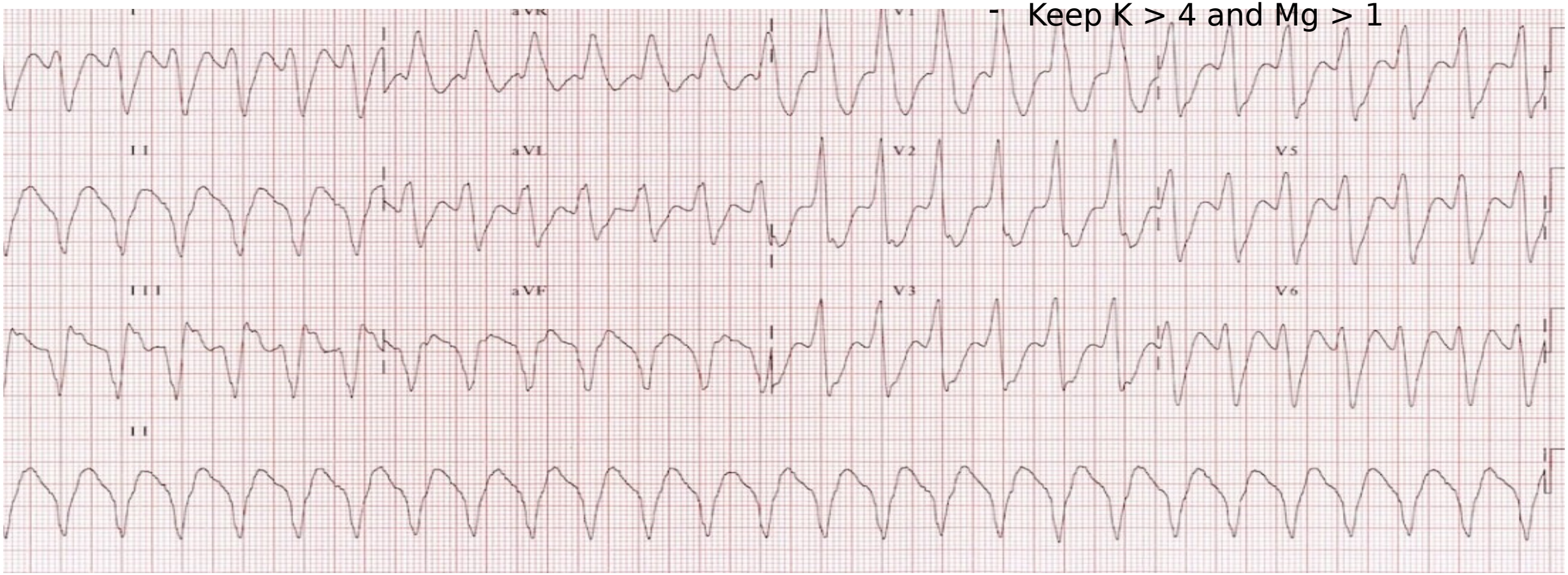
- Atrial fibrillation
- Atrial flutter with variable AV block
- Multifocal atrial tachycardia

SVT with aberrancy
- Patient has known RBBB at baseline



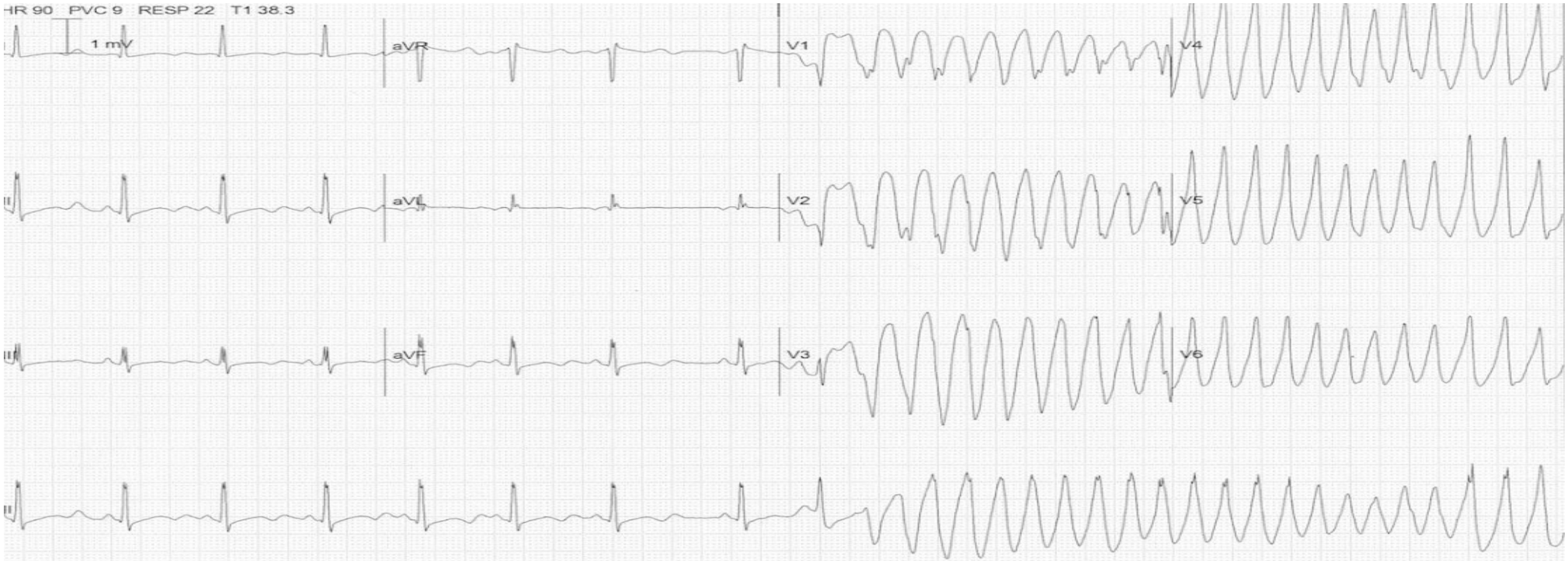
VT (monomorphic)

- Ischemia vs scar mediated
- Always call cardiology – should be admitted
- What is LVEF are they in heart failure
- Keep K > 4 and Mg > 1



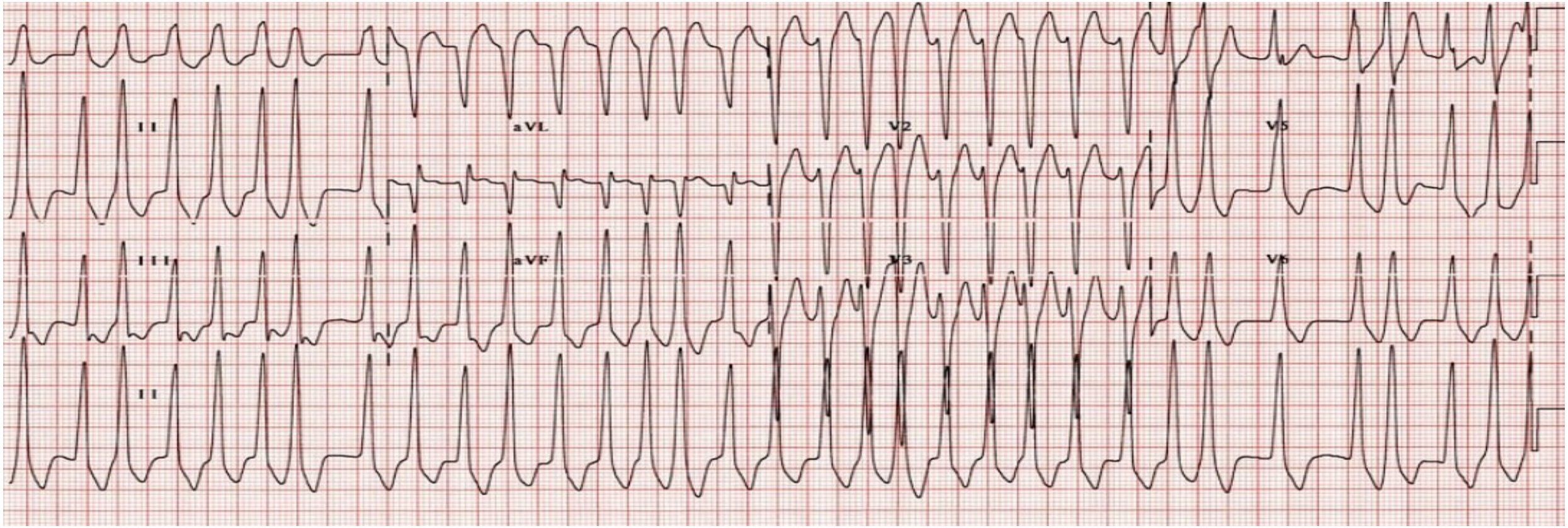
VT (polymorphic)

- What is the QT
- Check electrolytes



AF with WPW

- Best to cardiovert
- Always admit to cardiology
- Ablate accessory pathway



Wide Complex Tachycardia

- Ventricular tachycardia
- SVT with aberrancy
- AVRT
- WPW with AF

Sequelae of tachyarrhythmia

- Troponin elevation – anything < 1000 generally demand but based on history there may be underlying CAD that needs evaluation.
- Anytime cardioversion/defibrillation performed this will cause troponin elevation
- Look for signs of heart failure

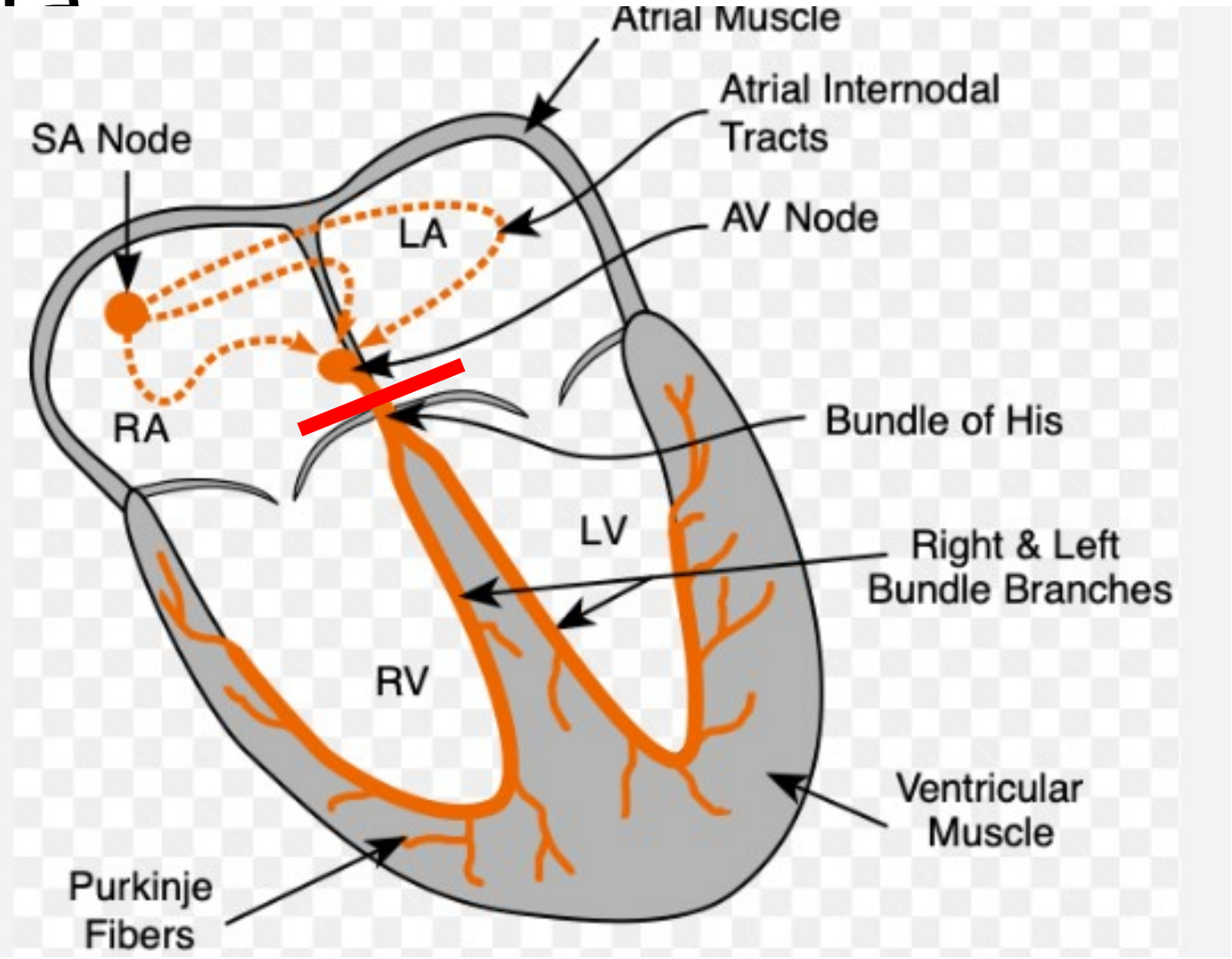
Key points for treatment of tachyarrhythmia

- Always compare to a previous
  - Does this patient have underlying aberrancy?
  - Is there known ischemia?
- Assess for decompensated heart failure as this will influence management.
  - Don’t give Diltiazem to slow down tachycardia (unless you know that patient has normal cardiac structure and is euvolemic)
  - If patient is euvolemic can give IV BB very fast acting should always give PO BB as well to have more effective rate lowering effect.
  - Digoxin and Amiodarone are best option when patient is in CHF
  - While patients are volume overloaded, cardioversion generally unsuccessful

Bradyarrhythmia

- Sinus bradycardia
- Mobitz type I

- Mobitz type II
- Complete Heart block

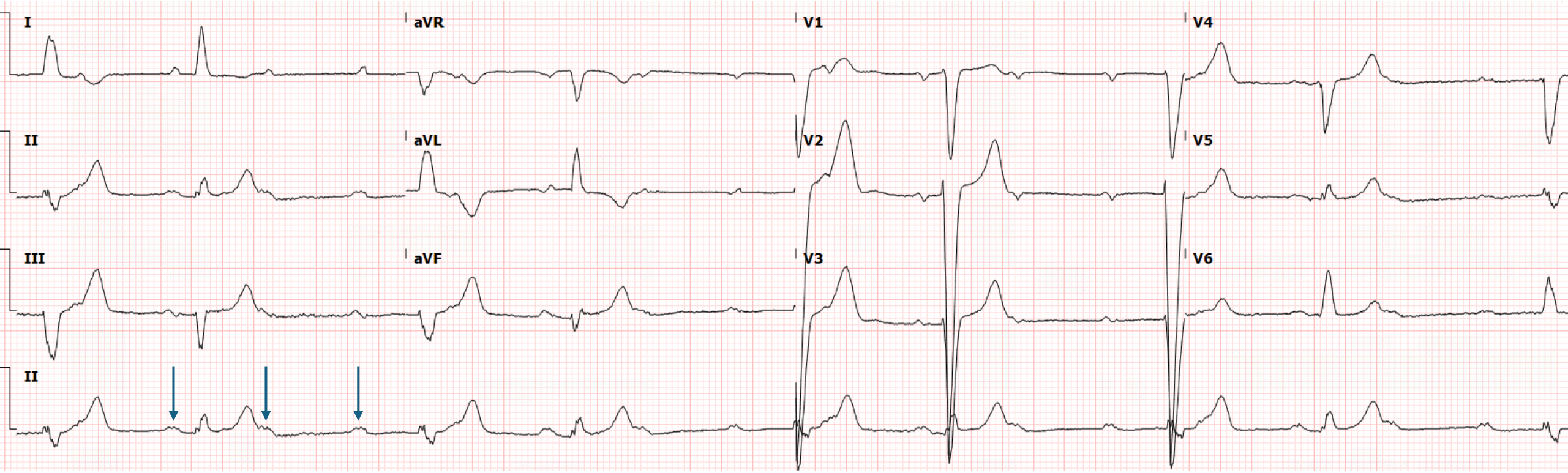


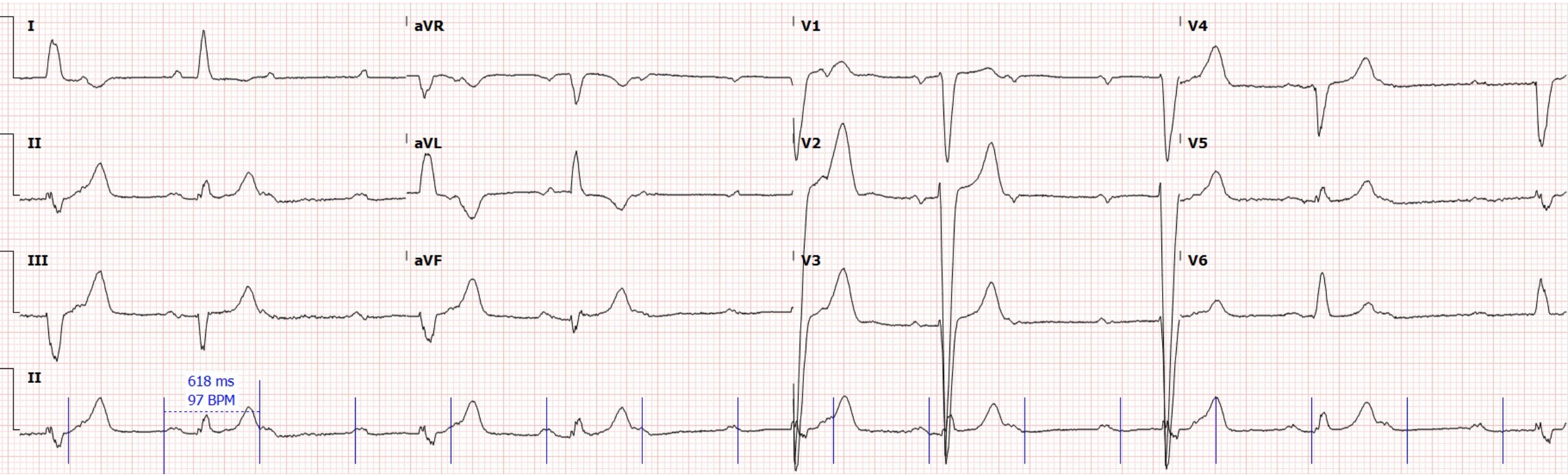
Don’t jump to pacing

- People tolerate bradycardia well. Only if HR is very slow and wide is pacing required.
- Is the patient actually symptomatic, can their HR elevate with activity?
- What medications are they on?

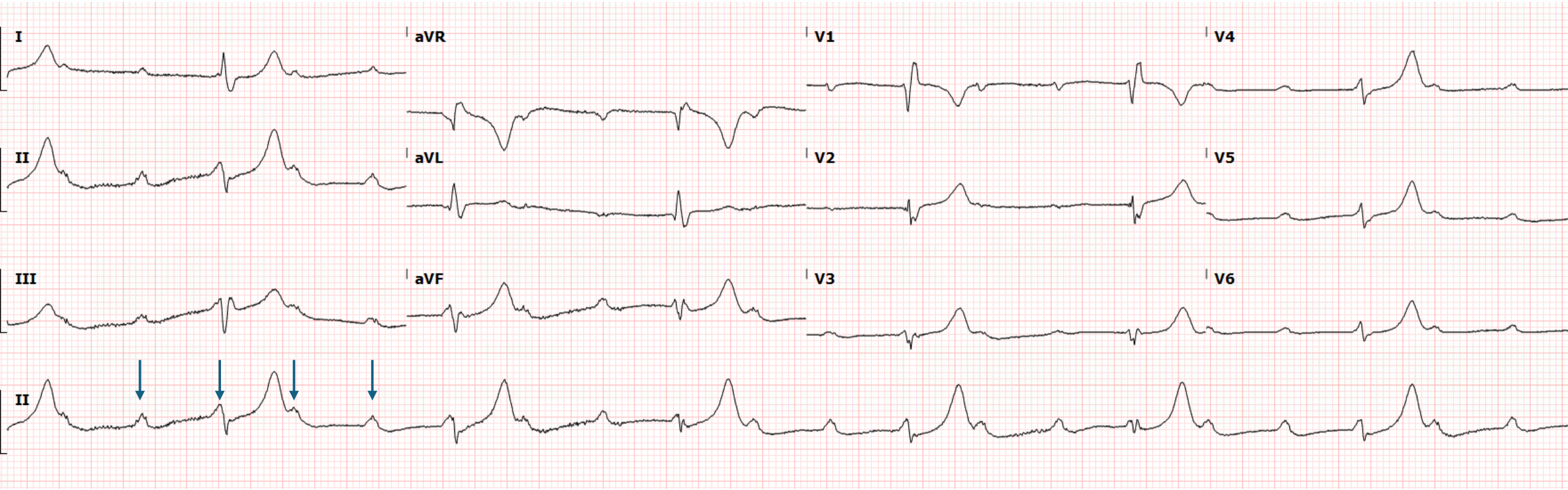
- Having slow HR can lead to HF, AKI and confusion

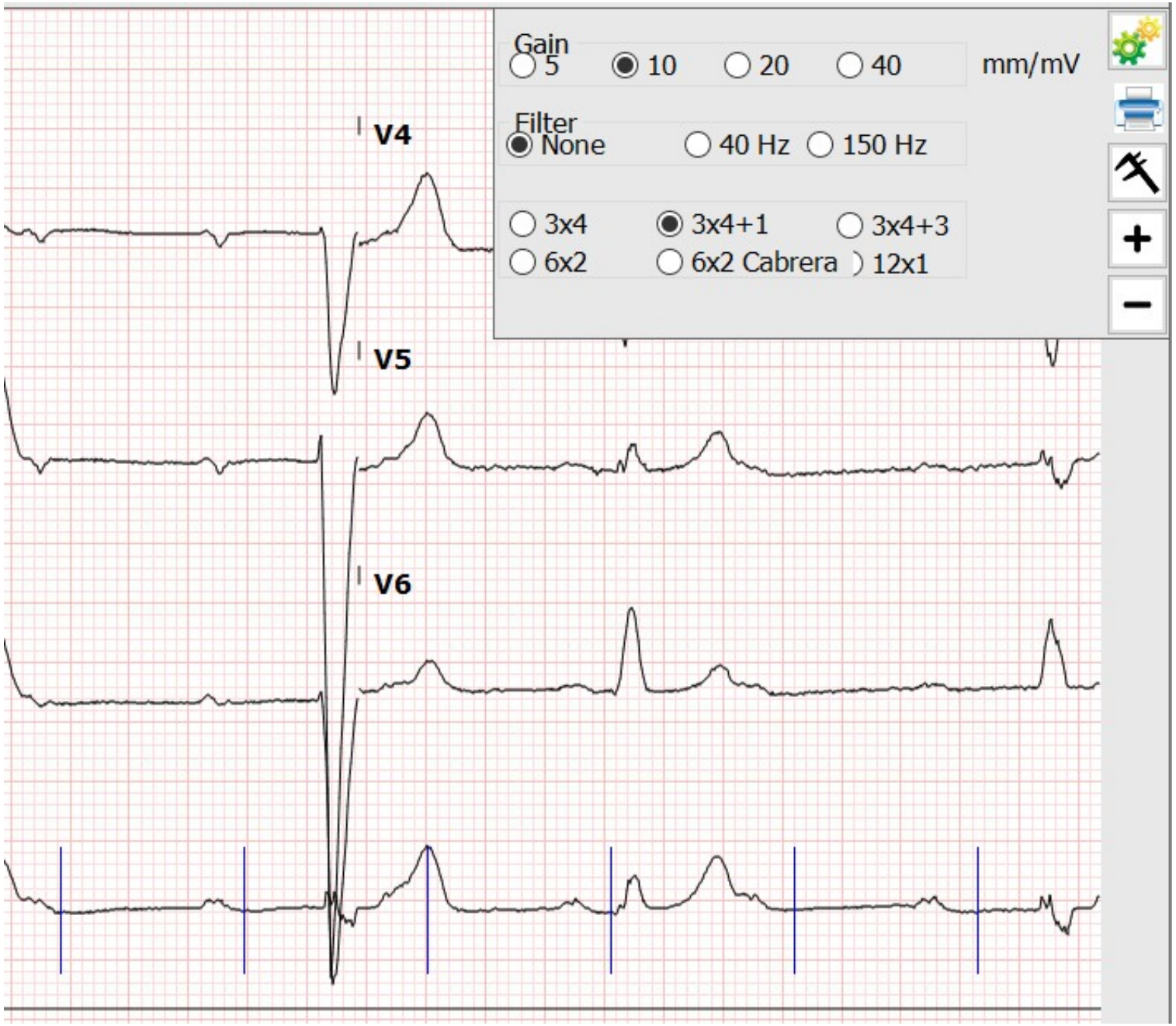
Case 1 - bradycardia




I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
618 ms
97 BPM

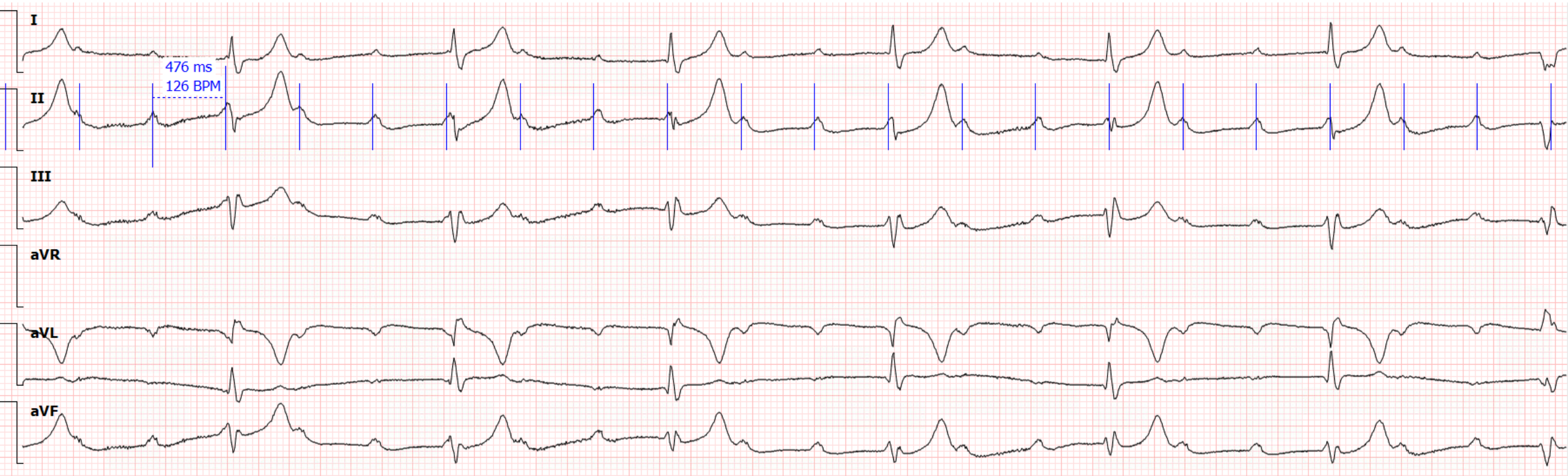
Case 2 – 80 F presenting with syncope

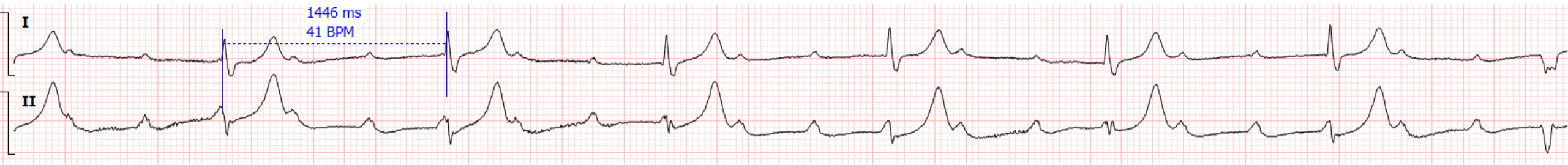


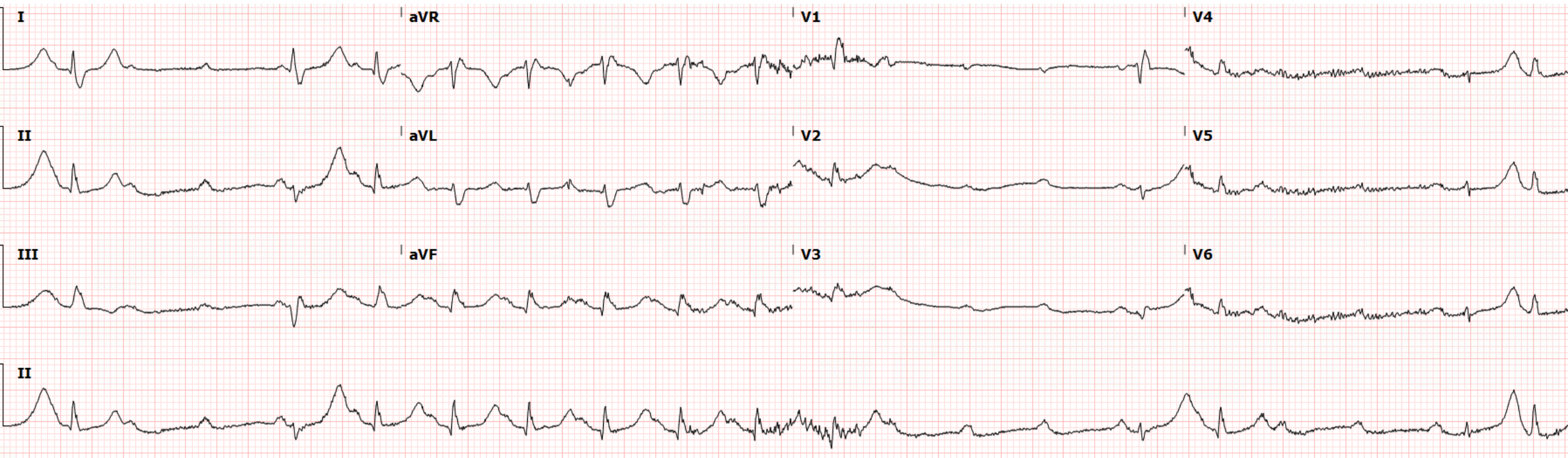


ECG Settings
change your format

Caliper Tool
'March out'


I
476 ms
126 BPM
II
III
aVR
aVL
aVF

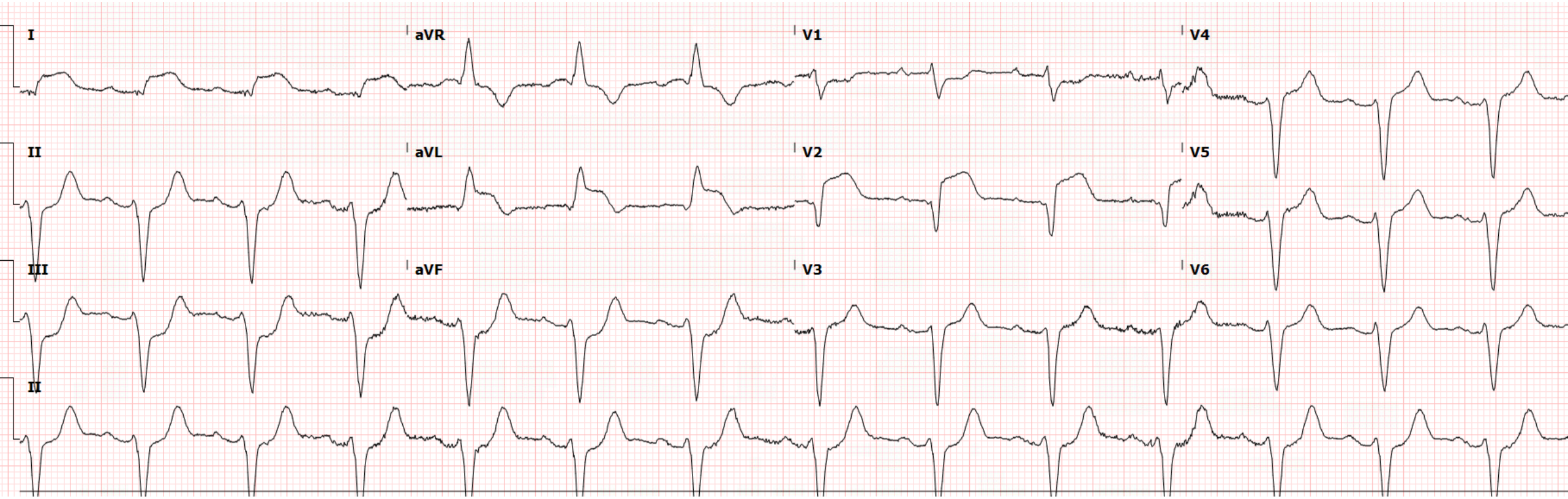

I
1446 ms
41 BPM
II


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

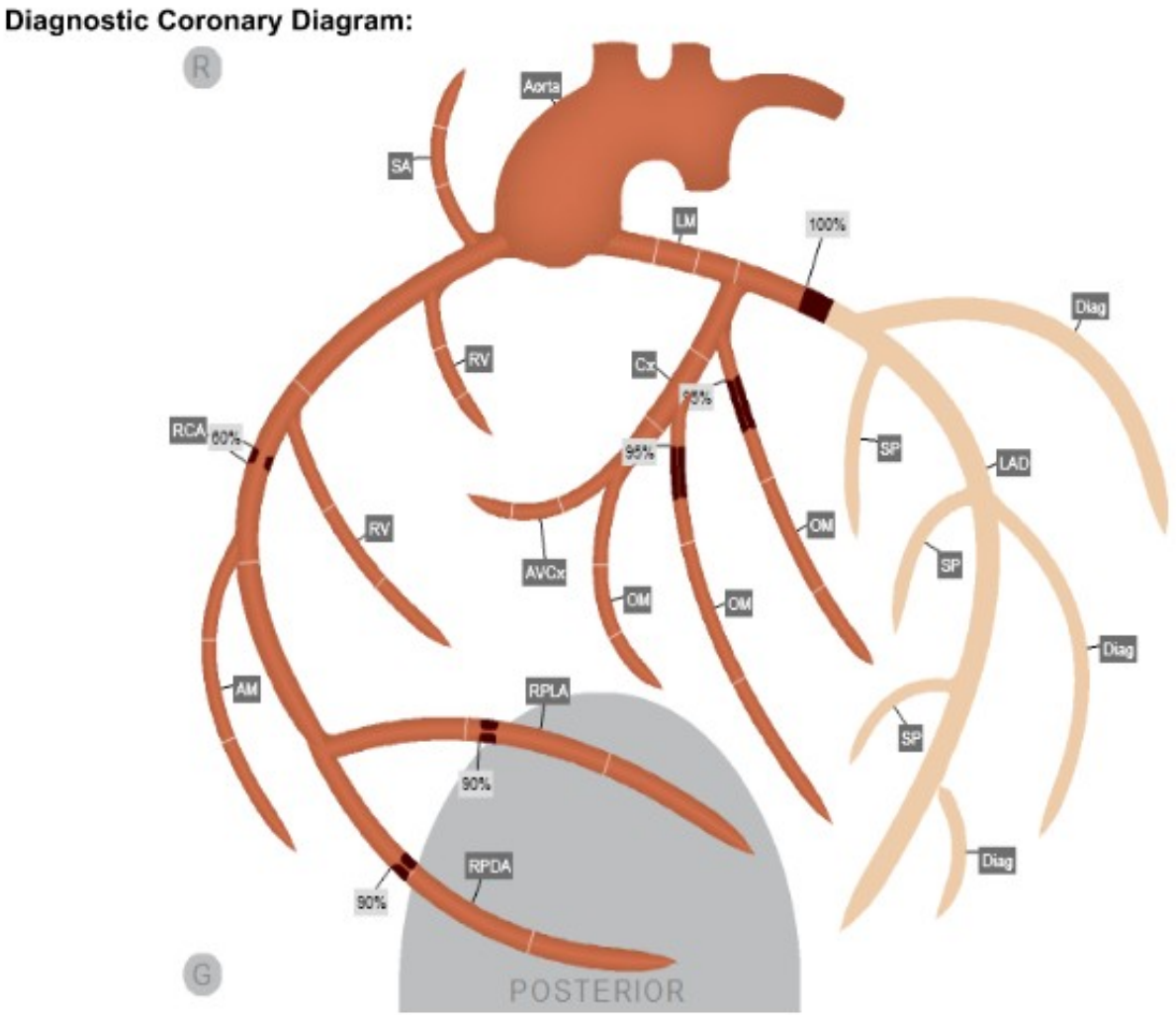
Key points with bradycardia

- What is the underlying rhythm
  - Sinus
  - AF/flutter
  - No atrial activity
- Determine following intervals
  - P-P
  - R-R
  - P-R
- How wide is the QRS
  - < 120 ms junctional escape rhythm, ventricular rate 40-60 bpm
  - > 120 ms in the absence of known BBB suggests infrahisian block with ventricular escape. These are unreliable and unstable, ventricular rate 15-40 bpm.

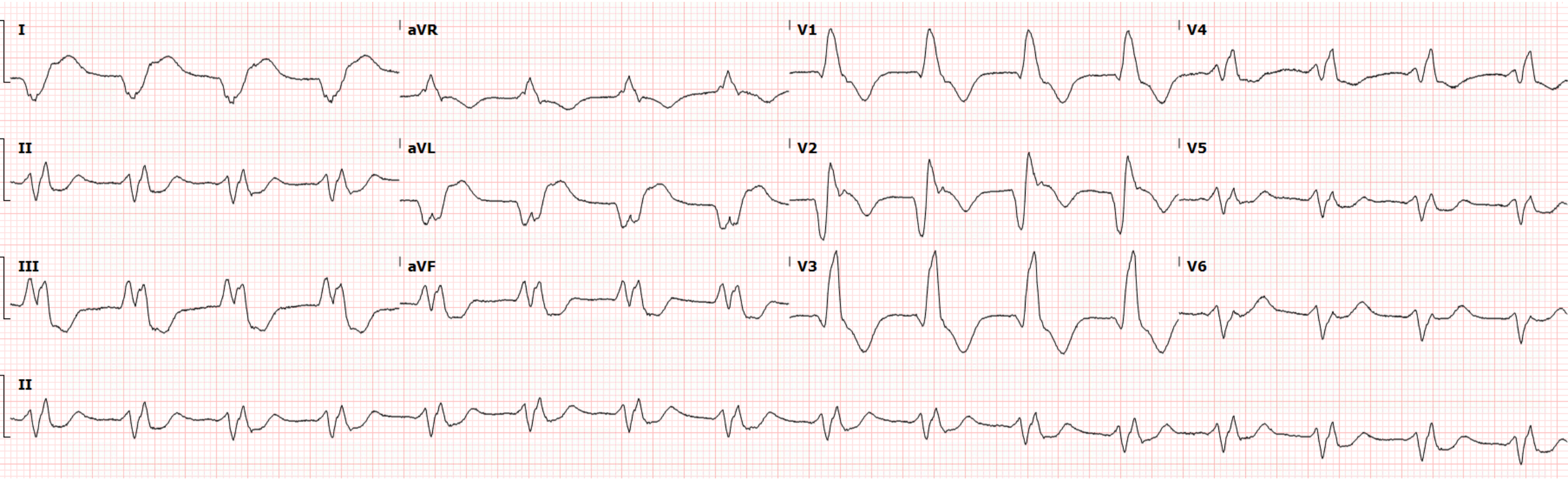
ACS interpreting the ECG



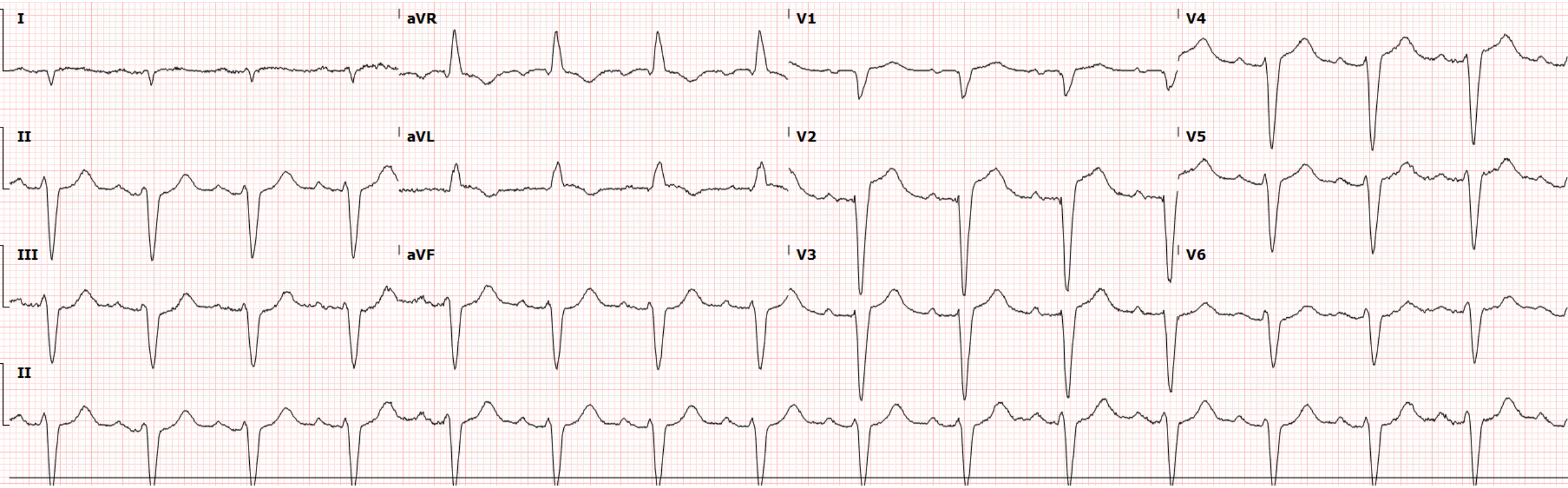
Translating ECG into cath findings



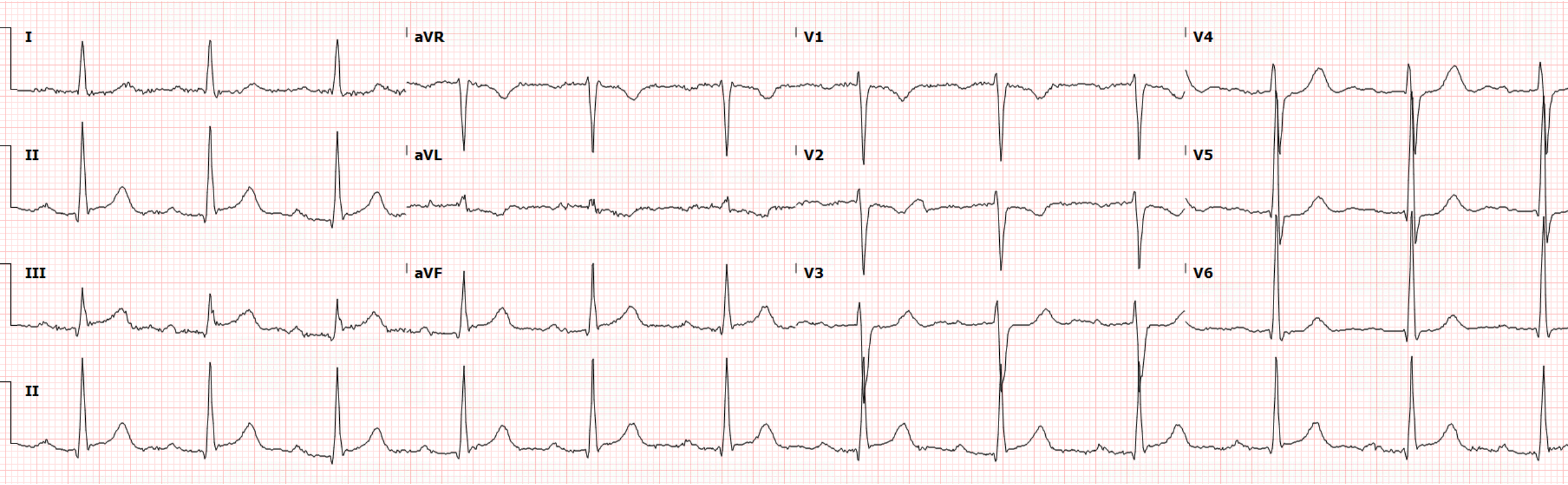
ACS post revascularization ECG – case 1



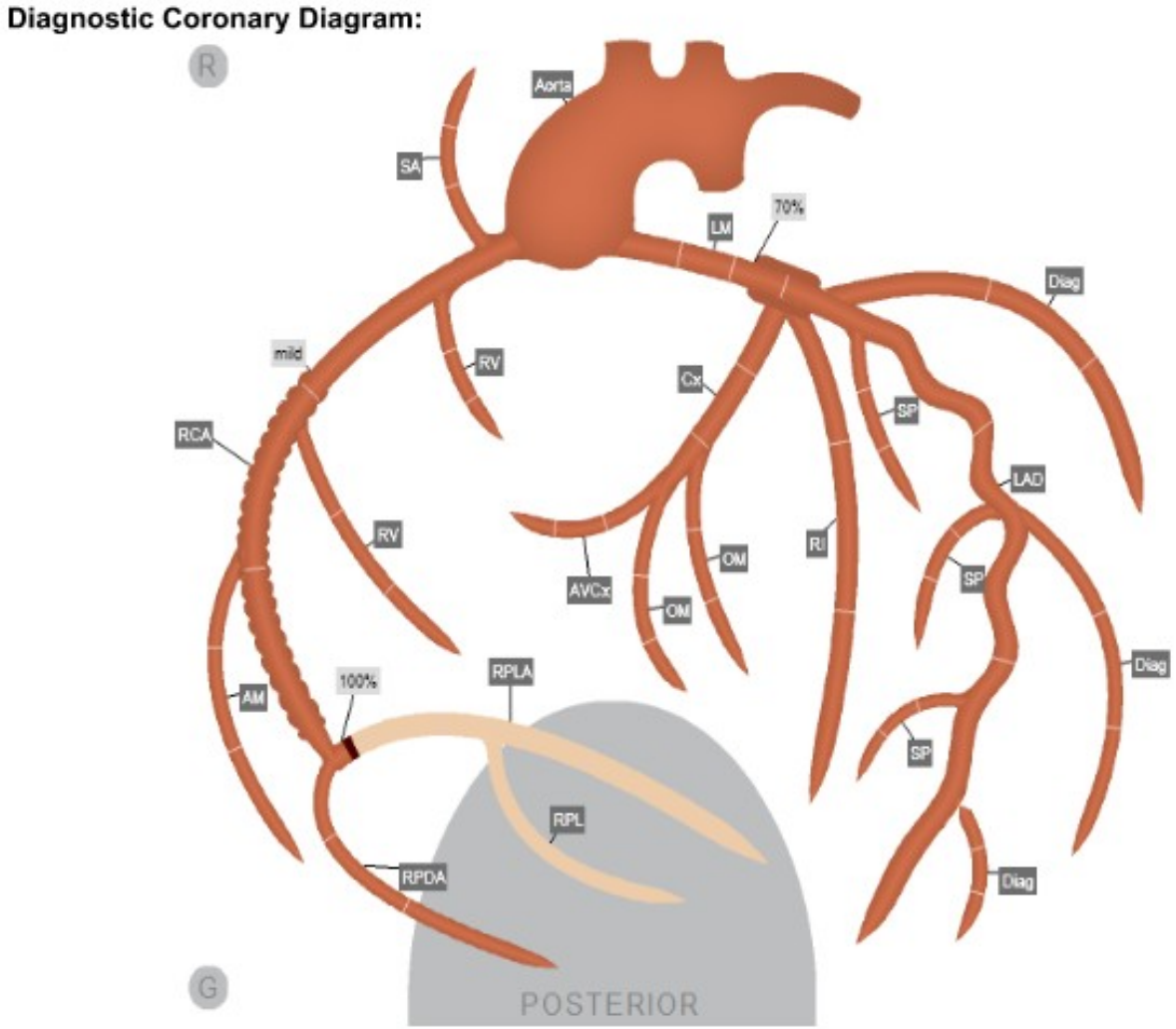
ACS post revascularization ECG -



ACS interpreting the ECG – case 2



Translating ECG with cath findings



ACS post revascularization ECG