

12 Lead EKG Mimics

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Objective

- At the end of this presentation the learner will be able to:
- Identify the common mimics and describe their prevalence.
- Describe process and interpretation techniques for managing mimics.

Pericarditis

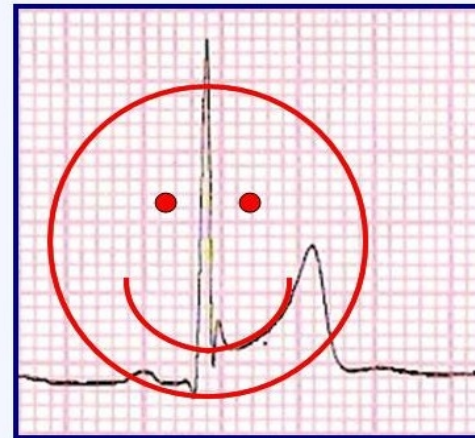
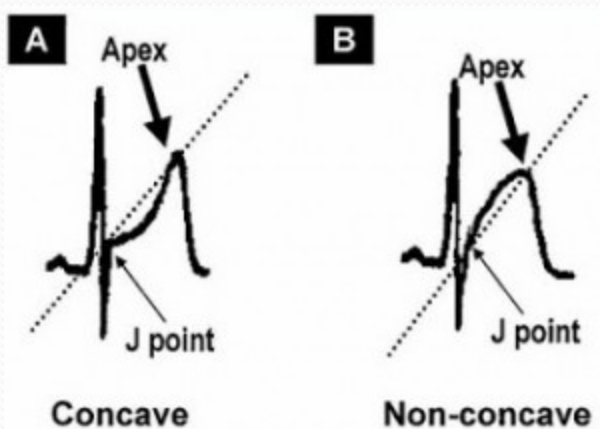
- Represents 5% of the patients that are seen in the hospital each year for chest pain.
- Causes include: Viral, bacterial, parasites, fungal, neoplastic, immune disorders, trauma, and idiopathic.
- Pericarditis should be identified by a sound assessment before it is noted on the 12-Lead.

Pericarditis Signs and Symptoms

- The classic sign of pericarditis is a pericardial friction rub that is heard over the left lower sternal border.
- Sharp, severe retrosternal chest pain that is worse in the supine position and with inspiration.
- Fever, chills, tachycardia.
- These patients will often present like an AMI patient.
- Pain is not relieved by NTG.

EKG changes in Pericarditis

- Diffuse ST Segment elevation in all leads except AVR.
- ST Segment will have a concave appearance.
- PR Depression will be present in the acute phase.

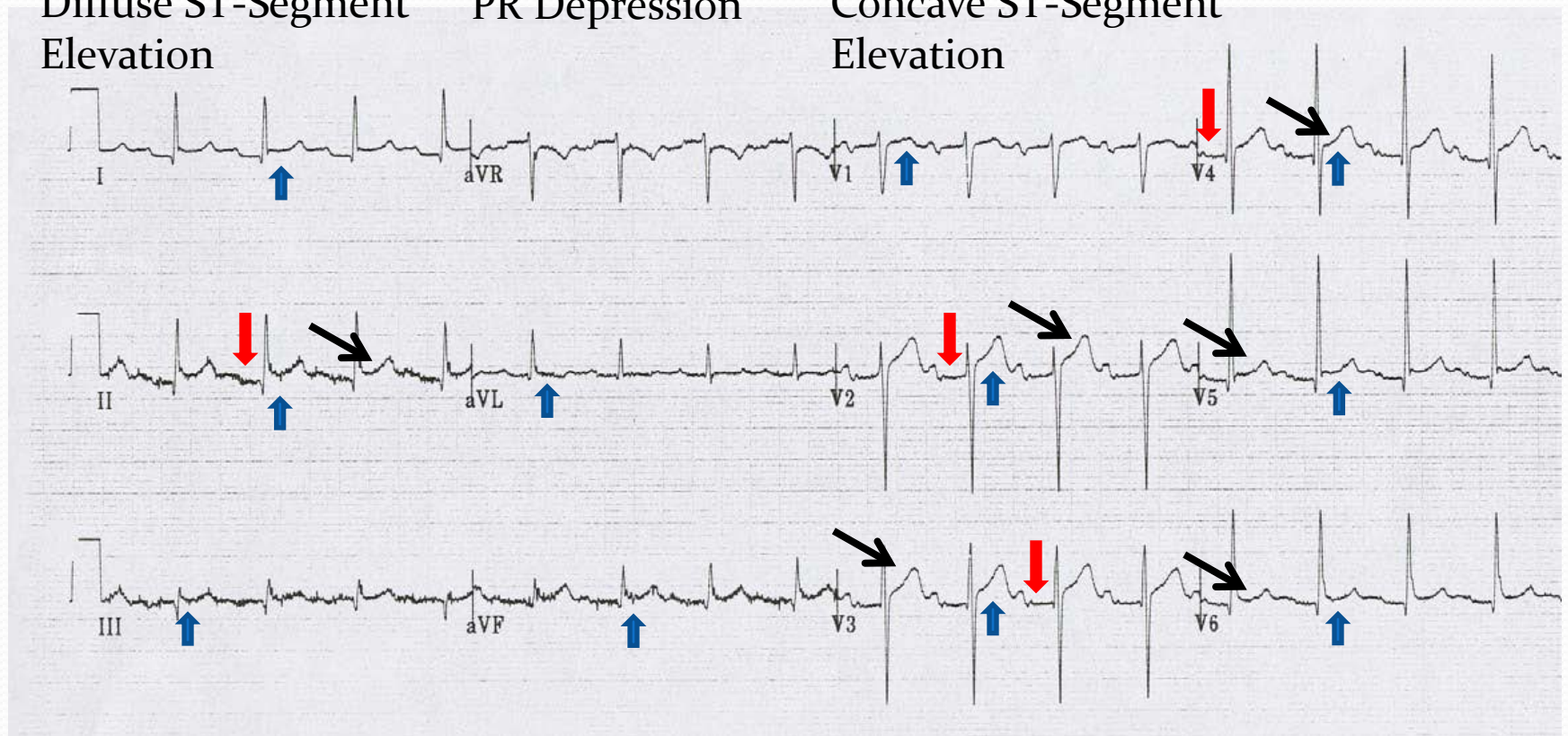


Pericarditis 12-Lead

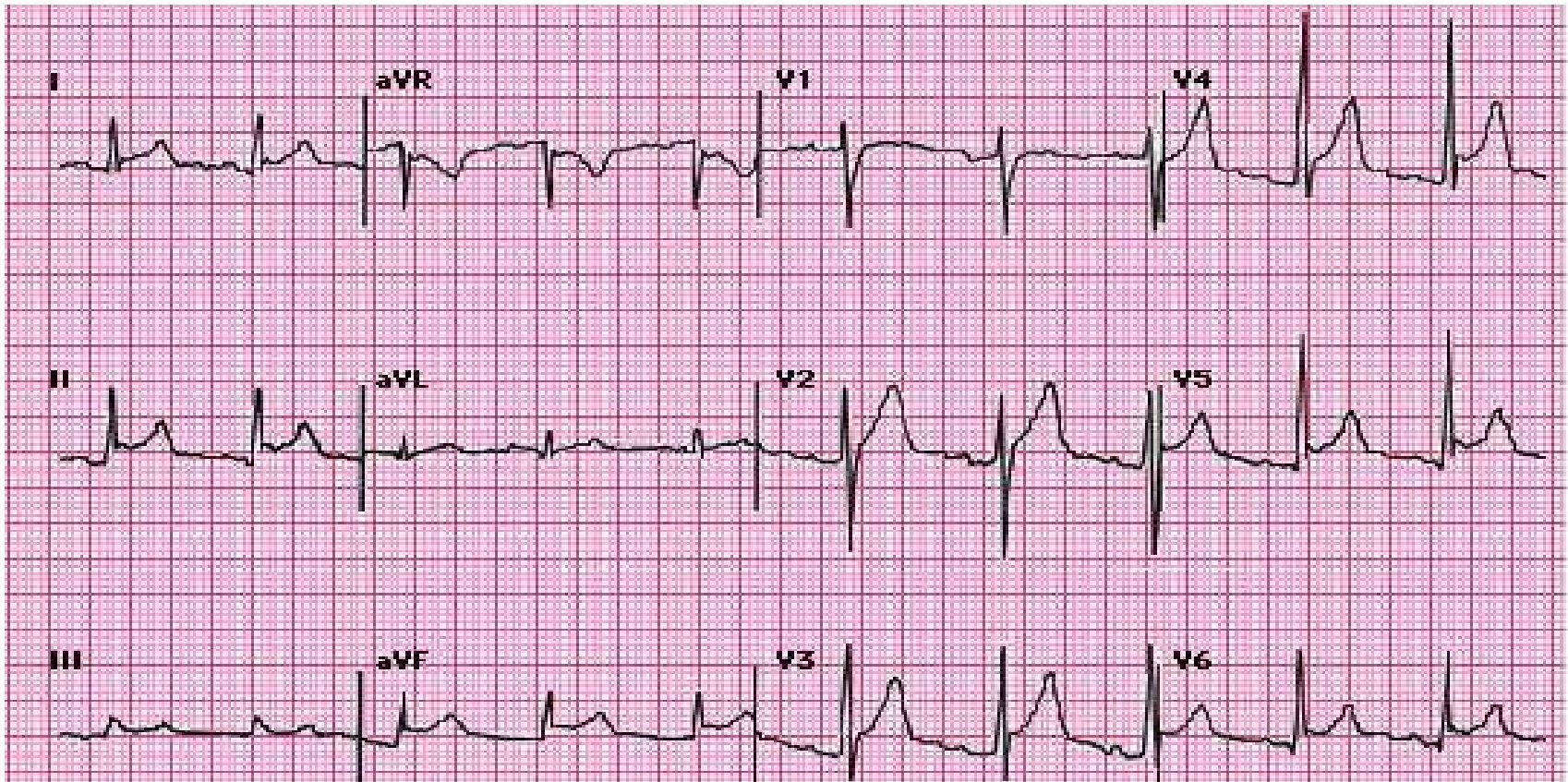
Diffuse ST-Segment
Elevation

PR Depression

Concave ST-Segment
Elevation



Pericarditis 12-Lead



Pericarditis Treatment

- In most patients treatment is supportive and with NSAIDS.
- If the underlying cause has been identified and is not viral, a specific treatment regimen can be ordered.

Left Ventricular hypertrophy (LVH)

- Increase in mass of the left ventricle.
- Can be a common finding in patients with hypertension.
- Diagnosed by 12-Lead EKG or echocardiography.
- Sensitivity of ECG to diagnose LVH is 7 to 35 percent in mild LVH and only 10 to 50 percent with moderate to severe disease.
- A patient with LVH has a 40% increased risk for a major myocardial event.

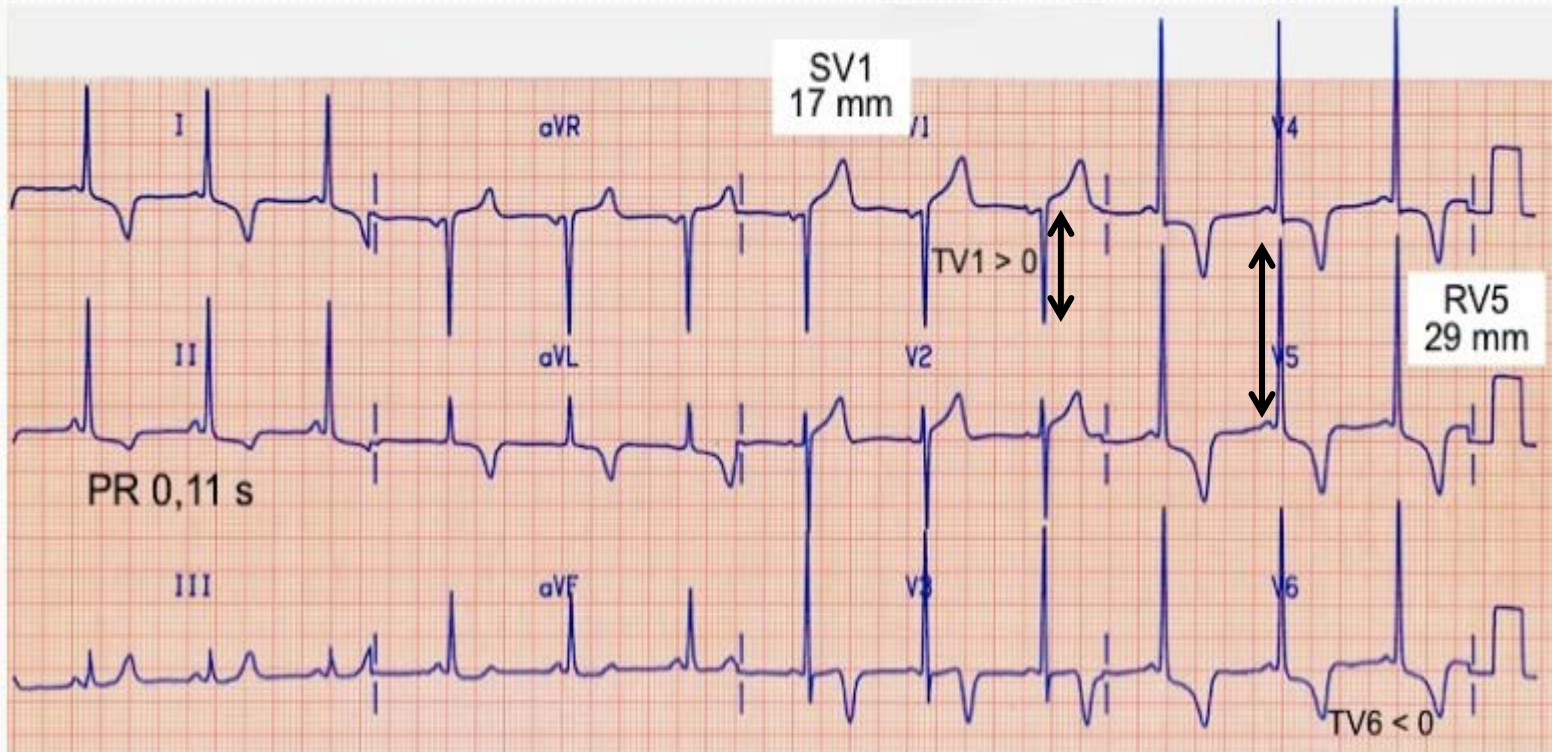
Sokolow-Lyon indices

- Sum of S wave in V₁ and R wave in V₅ or V₆ ≥ 3.5 mV (35 mm)

and/or

- R wave in aVL ≥ 1.1 mV (11 mm)

Sokolow-Lyon indices

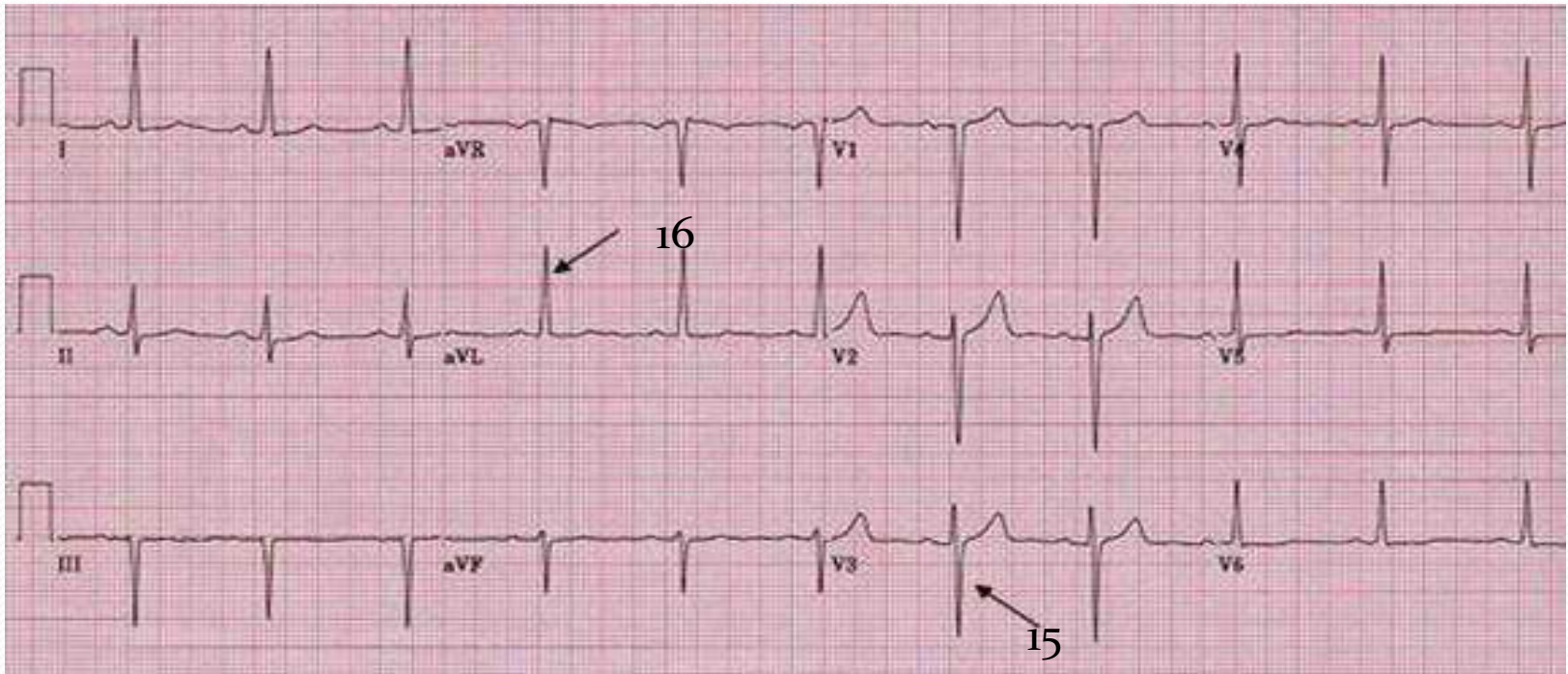


$$17 + 29 = 46$$

Cornell voltage criteria

- This criteria is based off of EKG studies that are designed to detect LVH in patients.
- The only gender specific criteria.
- For men: S in V_3 plus R in aVL >2.8 mV (28 mm)
- For women: S in V_3 + R in aVL >2.0 mV (20 mm)

Cornell Voltage Criteria for 56 yo male



$$16 + 15 = 31$$

Romhilt-Estes Point Score System

- This system is a points based system for specific EKG findings.
- A score of 5 or more is indicative of LVH.
- A score of 4 is a probable finding for LVH.

Romhilt-Estes Point Score System

Romhilt-Estes point score system for ECG diagnosis of LVH

Criterion	Points
Any limb R wave or S wave ≥ 2.0 mV (20 mm)	3
OR S in V1 or S in V2 ≥ 3.0 mV (30 mm)	
OR R in V5 or R in V6 ≥ 3.0 mV (30 mm)	
ST-T wave changes typical of LVH	
Taking digitalis	1
Not taking digitalis	3
Left atrial abnormality	
P terminal force in V1 is 1 mm or more in depth with a duration 40 ms (0.04 sec)	3
Left axis deviation $\geq -30^\circ$	2
QRS duration ≥ 90 ms	1
Intrinsicoid deflection in V5 or V6 ≥ 50 ms (0.05 sec)*	1

A score of 5 or more indicates "definite" LVH; a score of 4 indicates "probable" LVH.

* Intrinsicoid deflection is defined as interval between beginning of QRS interval and the peak of the R wave.

Left Ventricular hypertrophy (LVH)

Treatment

- Treating the patients hypertension will decrease the cardiac mass through:
 - Antihypertensive agents
 - Weight loss
 - Sodium restrictions

Hyperkalemia

- High potassium levels in the body can be caused by inadequate excretion (urinary), or excessive release of potassium from the cells.
- Clinical manifestations of hyperkalemia occur when serum potassium levels reach ≥ 7.0 meq/L in chronic patients or possibly at lower levels with an acute rise in serum potassium.

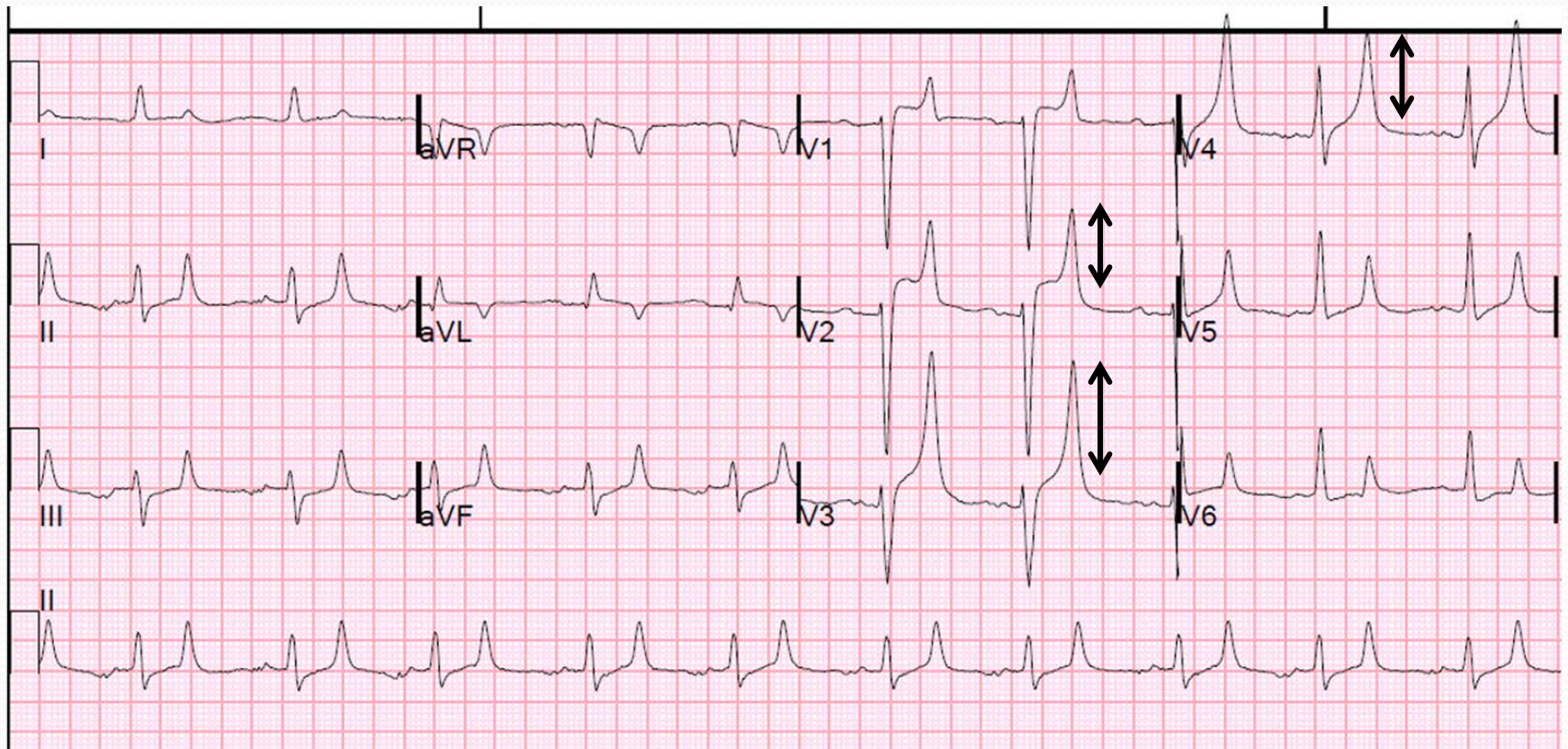
Hyperkalemia Clinical Manifestations

- Muscle weakness and paralysis: Ascending in nature usually starting at the feet and progressing to the trunk and arms. Respiratory weakness is rare.
- Cardiac Abnormalities/Arrhythmias: RBB, LBB, Sinus Bradycardia, Sinus Arrest, Ventricular Tachycardia, Ventricular Fibrillation, and Asystole.

Hyperkalemia Clinical Manifestations

- 12-lead EKG Changes Include:
- Tall peaked T waves.
- Shortened QT interval.
- As serum potassium levels rise to dangerous levels the PR interval will lengthen, QRS will widen, and the P wave may disappear.

Hyperkalemia on a 12-lead



Thank You