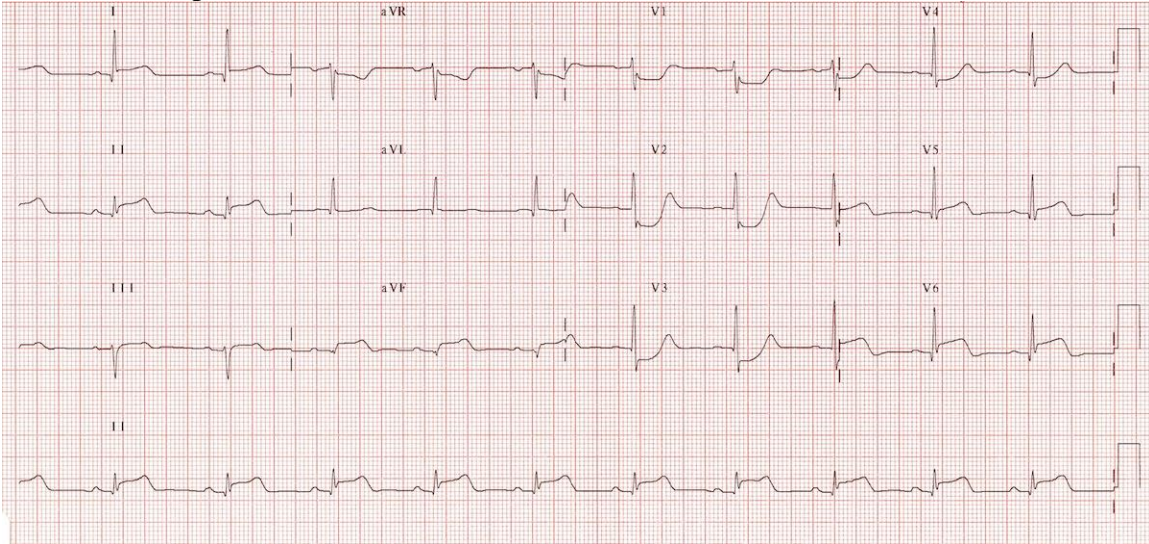**Acute Posterior MI**
Justin Yuan, MD

You are presented with an EKG from triage.

It shows ST depression in V1-V4 and elevation in II, III, aVF

The patient is moved to a resuscitation booth and upper level resident you are working with intelligently decides to obtain a posterior EKG looking for an acute posterior wall MI.

Acute posterior wall myocardial infarction can be a difficult diagnosis to make and one you cannot miss. One study showed that only 38% of physicians made the diagnosis based on EKG in the setting of chest pain. It is difficult to recognize, as a normal 12 lead-EKG does not directly look at this anatomical location of the heart. Posterior MI refers to the part of the left ventricle inferior to the AV sulcus. Anteroseptal leads face the internal surface of the posterior myocardium resulting in an **inverted injury pattern**. The **circumflex artery or right coronary artery** is typically occluded during a PMI and in 10% of the population the circumflex is the dominant vessel. Isolated posterior MI is not common and **usually occurs with an inferior or lateral infarct** resulting in larger sized infarct leading to increased risk of complications.

Diagnosis of posterior MI on EKG includes:
- **Horizontal ST depression of V1-V3**
- **Tall, R waves >30ms of V1-V3**
- **Upright T waves**
- **Dominant R wave in V2**

When obtaining a posterior EKG, leads V4-V6 can be placed inferior to the left scapula all at the level of V6 (5ᵗʰ intercostal space) to obtain V7-V9
- V7- posterior axillary line

- V8- just below tip of the scapula
- V9- at paravertebral border
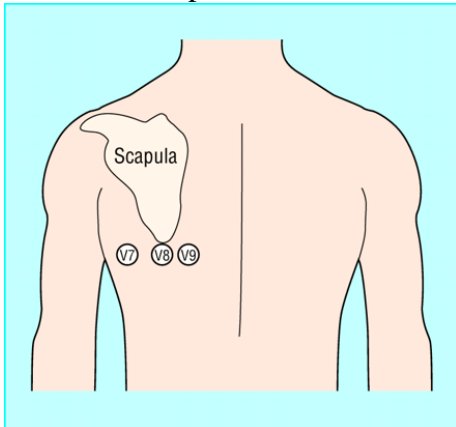
ST elevation >0.5mm in one posterior lead (V7-V9) most sensitive and specific criteria to diagnose posterior infarction based on study by Maetsky.

Using a 15 lead EKG significantly improved the sensitivity and PPV for diagnosis of PMI with the sensitivity increasing from 57.7 to 66.1% and PPV increasing from 88.4-96.8%.

A posterior EKG was obtained for this patient:
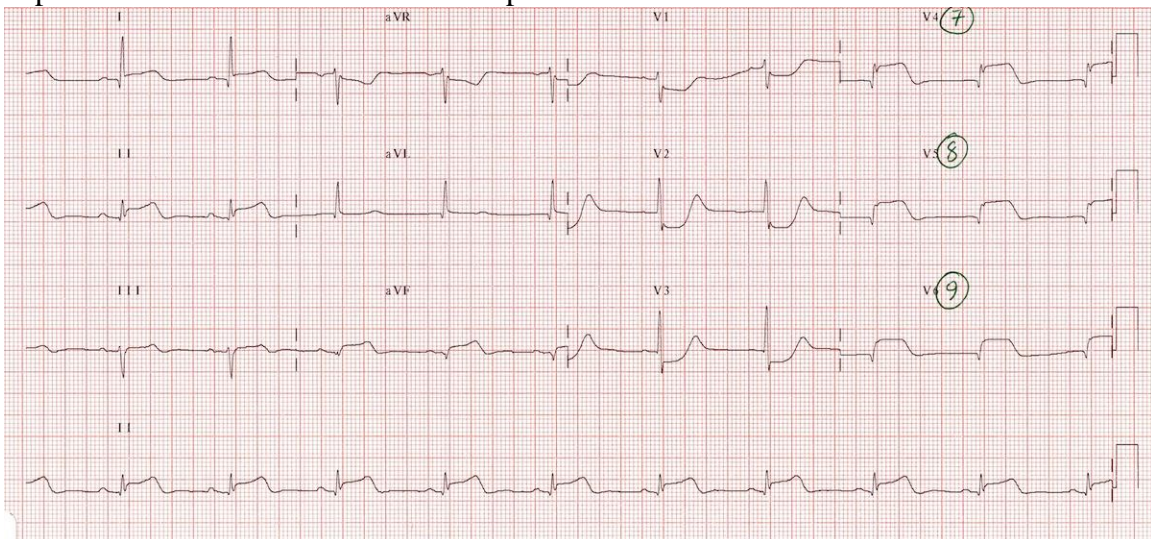
It showed additional elevations in V7-V9. The cath lab was activated and patient was found to have 100% occlusion of the circumflex artery.

Whenever I see ST depression in V1-V3 I will now reflexively obtain a posterior EKG to look for posterior myocardial infarction.

References:
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1847720/

http://lifeinthefastlane.com/ecg-library/pmi/
http://www.ncbi.nlm.nih.gov/pubmed/20961938
http://hqmeded-ecg.blogspot.com/2009/04/pure-isolated-posterior-stemi-not-so.html