

# ECG Rhythm Interpretation

## Module V

### Acute Myocardial Infarction

# Course Objectives

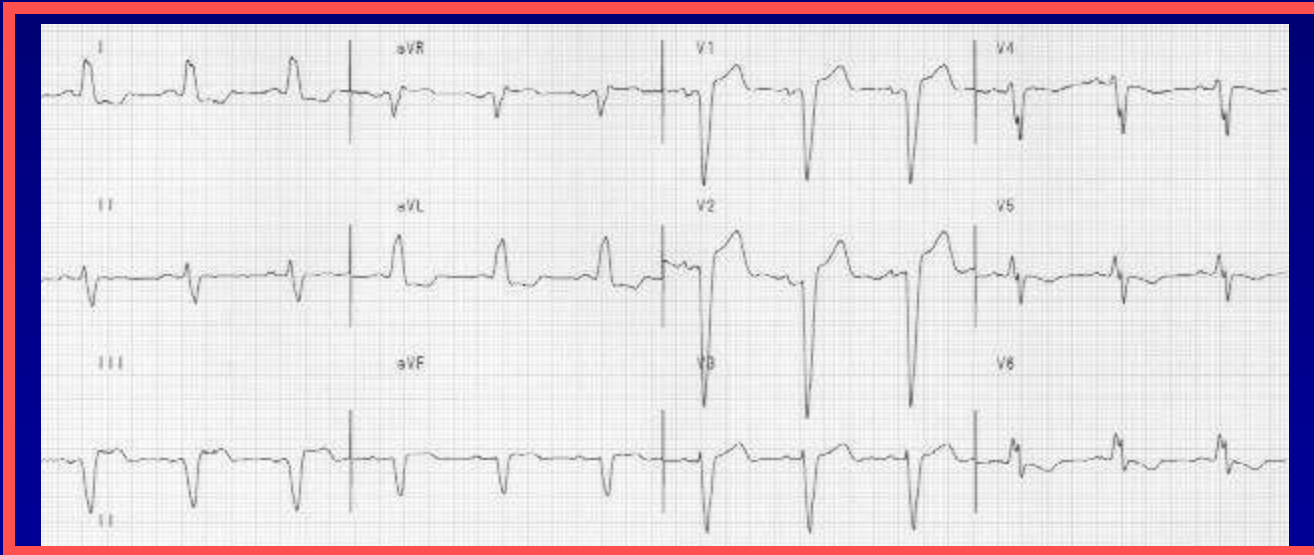
- To recognize the normal rhythm of the heart - “Normal Sinus Rhythm.”
- To recognize the 13 most common heart arrhythmias.
- To recognize an acute myocardial infarction on a 12-lead ECG.

# Learning Modules

- ECG Basics
- How to Analyze a Rhythm
- Normal Sinus Rhythm
- Heart Arrhythmias
- Diagnosing a Myocardial Infarction
- Advanced 12-Lead Interpretation

# Diagnosing a MI

To diagnose a myocardial infarction you need to go beyond looking at a rhythm strip and obtain a 12-Lead ECG.



12-Lead ECG

Rhythm Strip



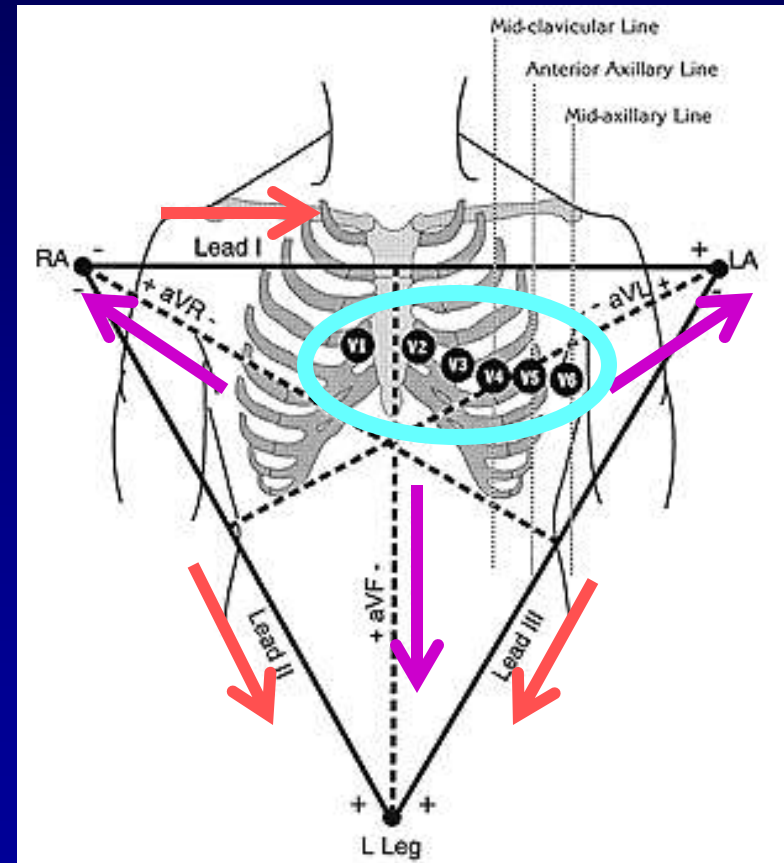
# The 12-Lead ECG

- The 12-Lead ECG sees the heart from 12 different views.
- Therefore, the 12-Lead ECG helps you see what is happening in different portions of the heart.
- The rhythm strip is only 1 of these 12 views.

# The 12-Leads

The 12-leads include:

- 3 Limb leads (I, II, III)
- 3 Augmented leads (aVR, aVL, aVF)
- 6 Precordial leads (V<sub>1</sub>- V<sub>6</sub>)



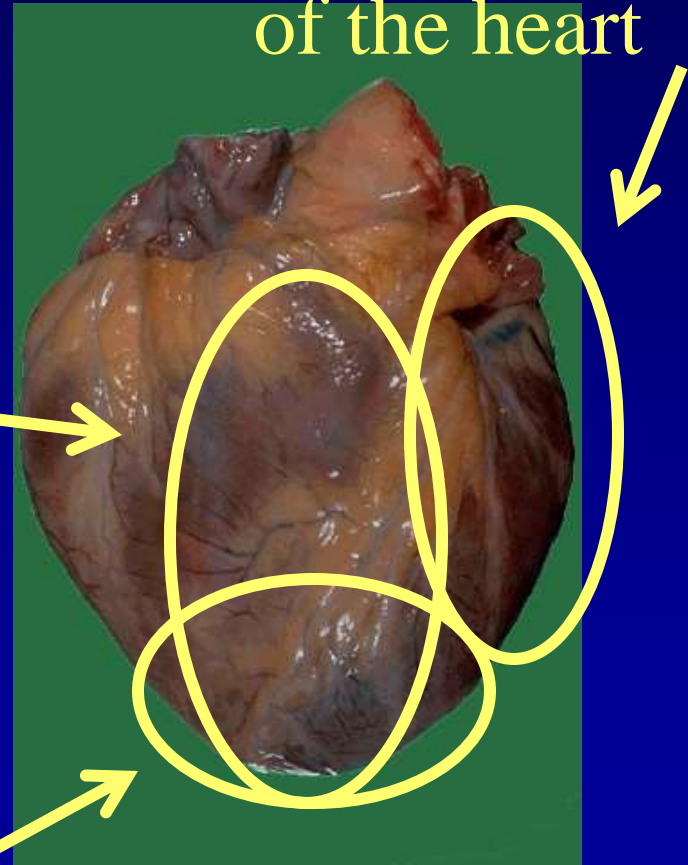
# Views of the Heart

Some leads get a good view of the:

Anterior portion  
of the heart

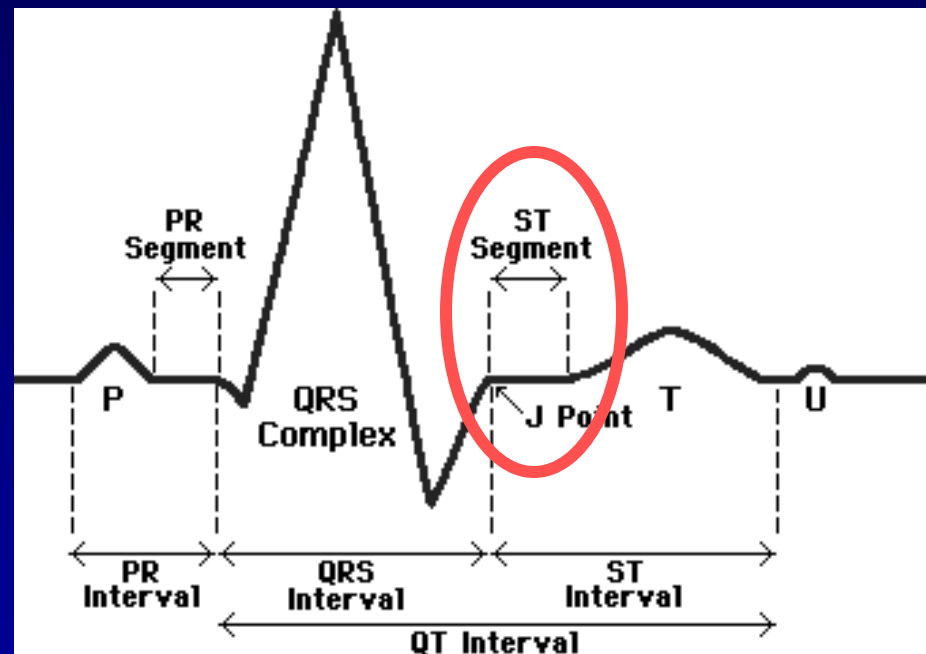
Inferior portion  
of the heart

Lateral portion  
of the heart



# ST Elevation

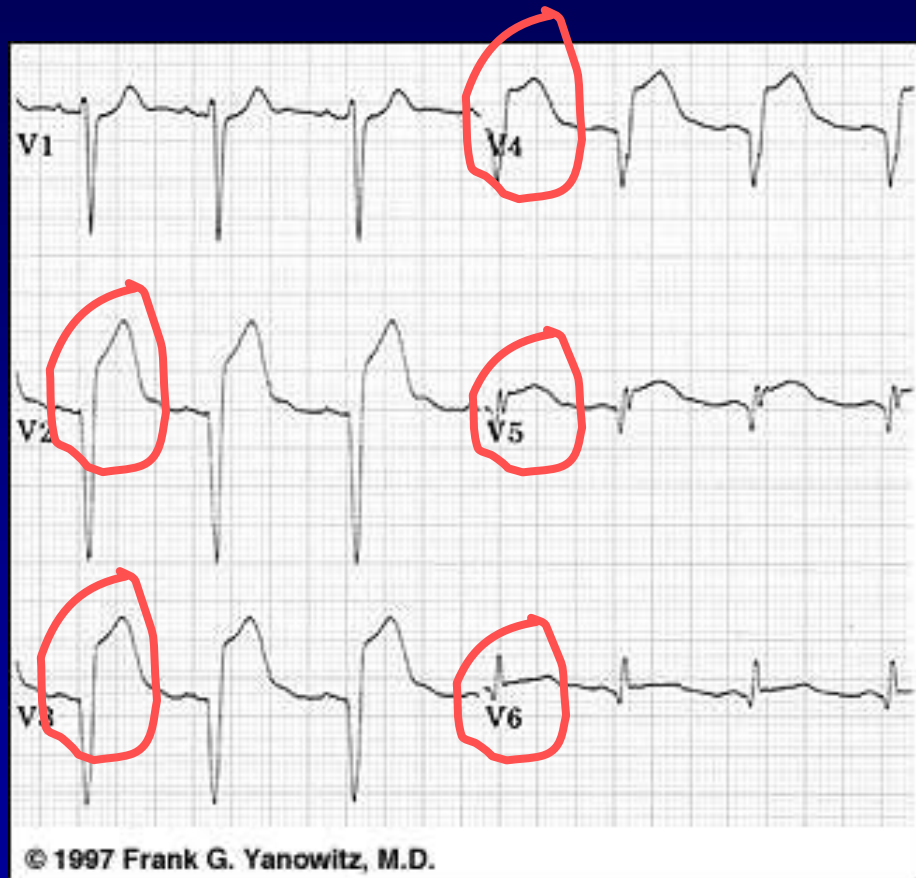
One way to diagnose an acute MI is to look for elevation of the ST segment.





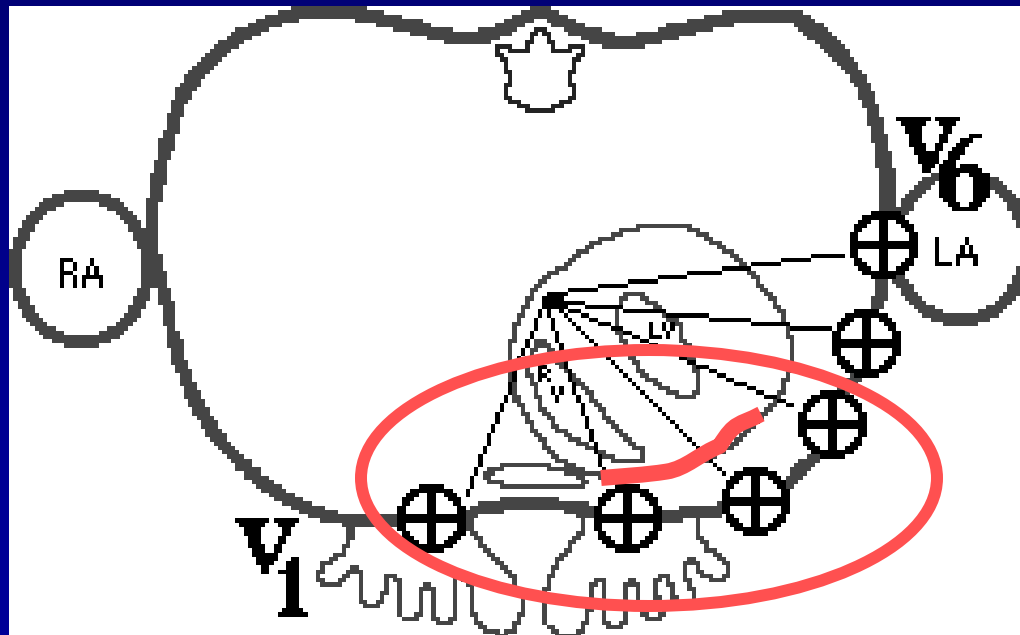
# ST Elevation (cont)

Elevation of the ST segment (greater than 1 small box) in 2 leads is consistent with a myocardial infarction.



# Anterior View of the Heart

The anterior portion of the heart is best viewed using leads  $V_1 - V_4$ .

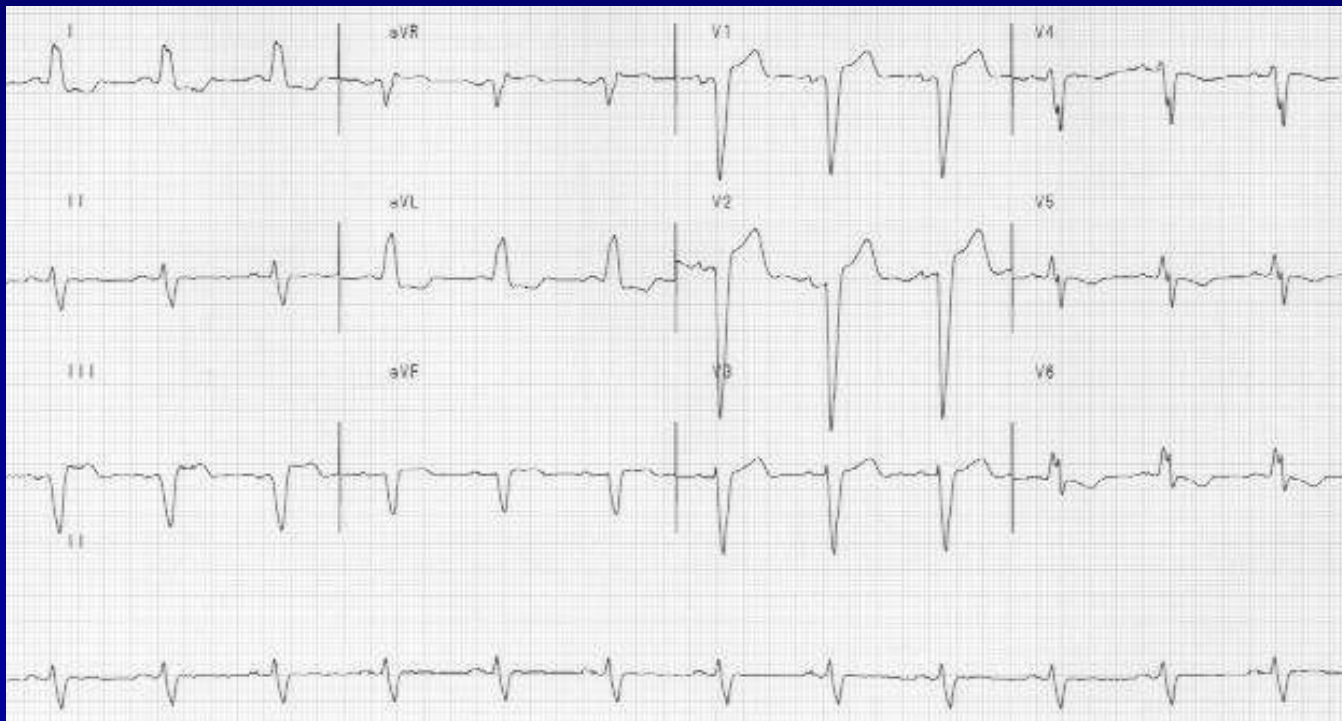


# Anterior Myocardial Infarction

If you see changes in leads  $V_1 - V_4$  that are consistent with a myocardial infarction, you can conclude that it is an anterior wall myocardial infarction.

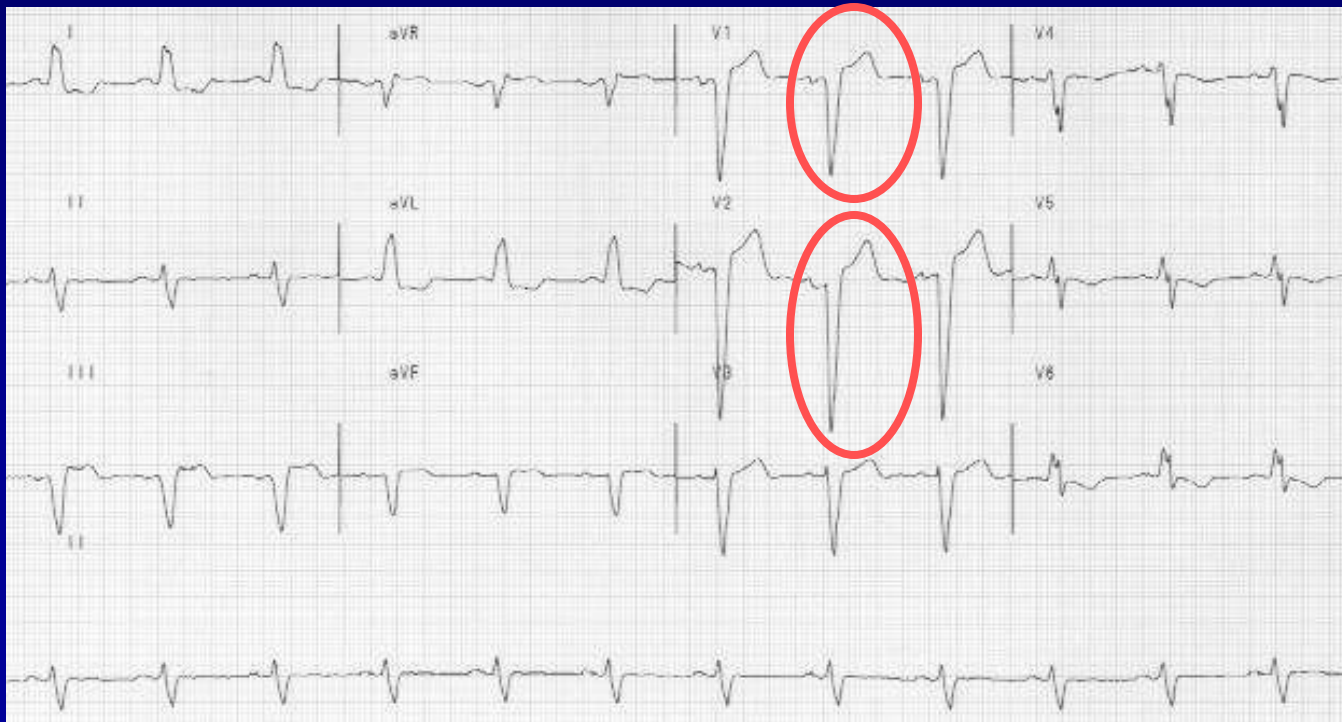
# Putting it all Together

Do you think this person is having a myocardial infarction. If so, where?



# Interpretation

**Yes**, this person is having an acute anterior wall myocardial infarction.



# Other MI Locations

Now that you know where to look for an anterior wall myocardial infarction let's look at how you would determine if the MI involves the lateral wall or the inferior wall of the heart.

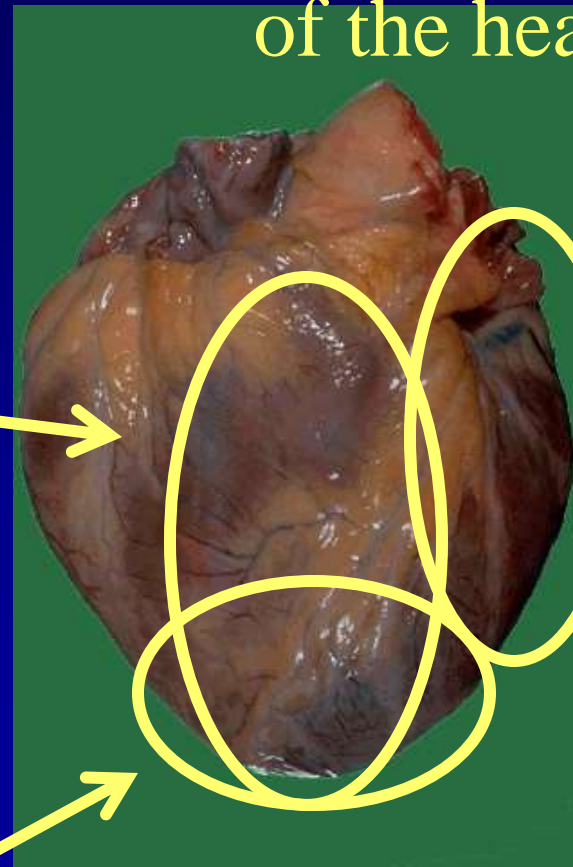
# Other MI Locations

First, take a look again at this picture of the heart.

Lateral portion of the heart

Anterior portion of the heart

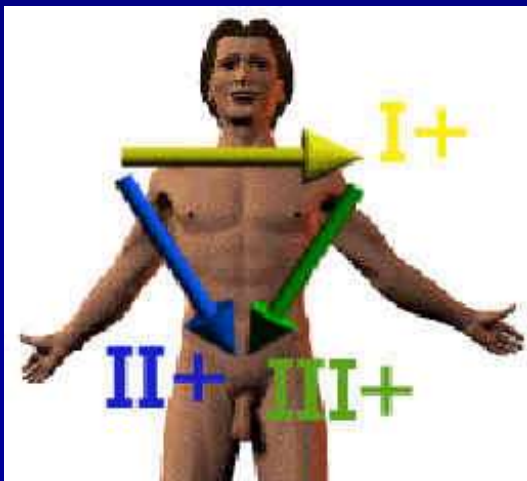
Inferior portion of the heart



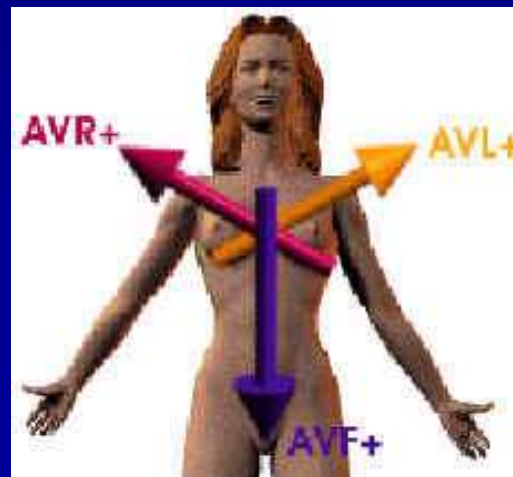
# Other MI Locations

Second, remember that the 12-leads of the ECG look at different portions of the heart. The limb and augmented leads “see” electrical activity moving inferiorly (II, III and aVF), to the left (I, aVL) and to the right (aVR). Whereas, the precordial leads “see” electrical activity in the posterior to anterior direction.

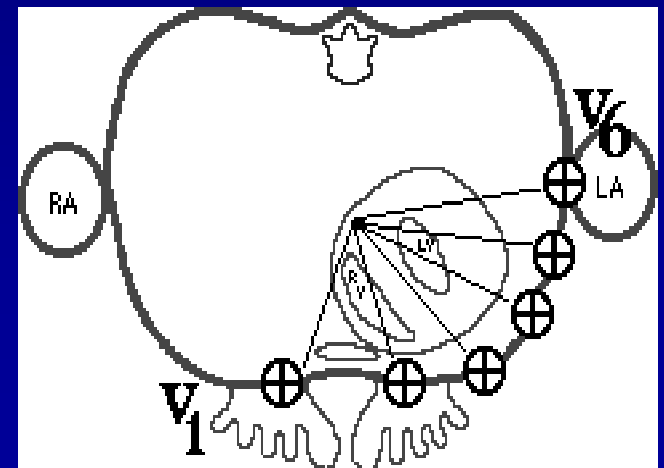
## Limb Leads



## Augmented Leads



## Precordial Leads

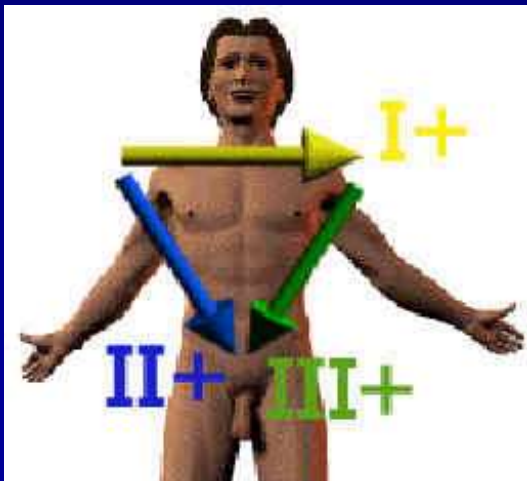




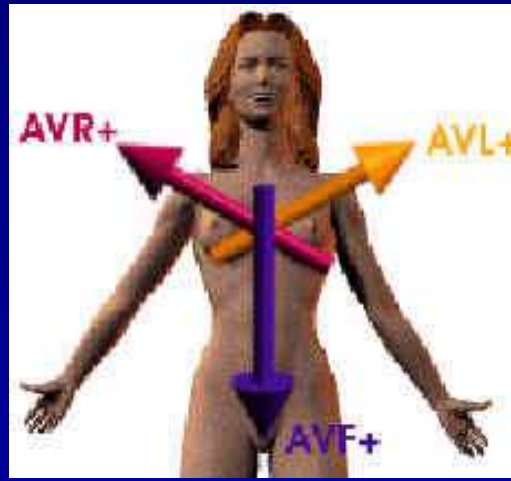
# Other MI Locations

Now, using these 3 diagrams let's figure where to look for a lateral wall and inferior wall MI.

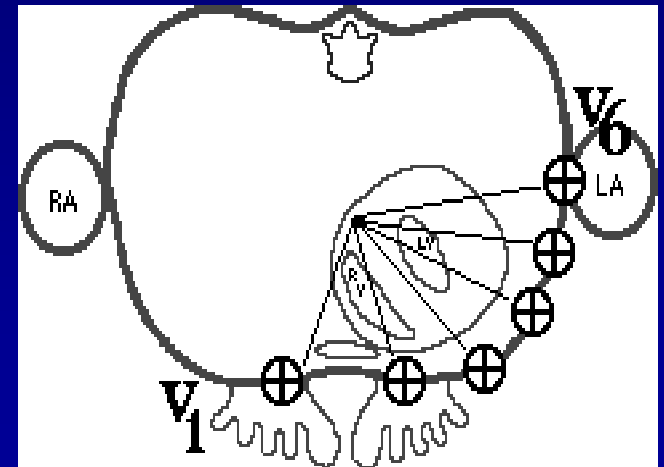
**Limb Leads**



**Augmented Leads**



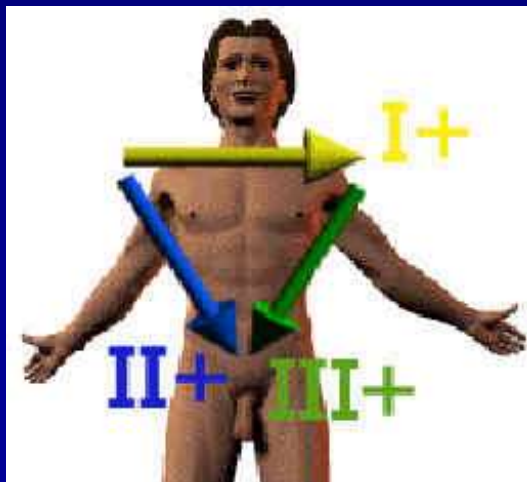
**Precordial Leads**



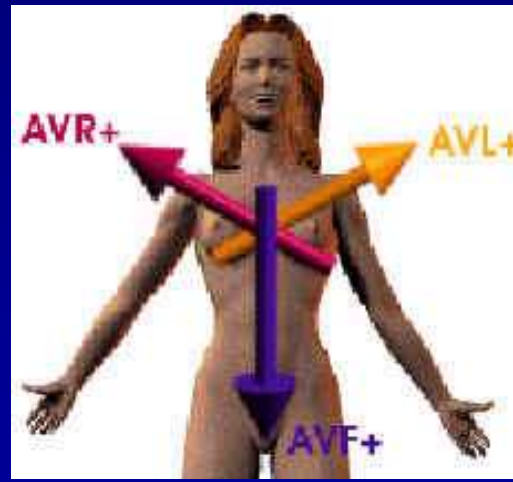
# Anterior MI

Remember the anterior portion of the heart is best viewed using leads  $V_1$ - $V_4$ .

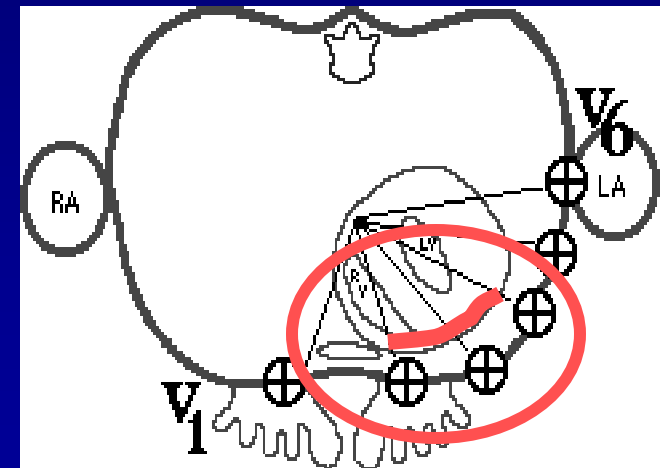
Limb Leads



Augmented Leads



Precordial Leads

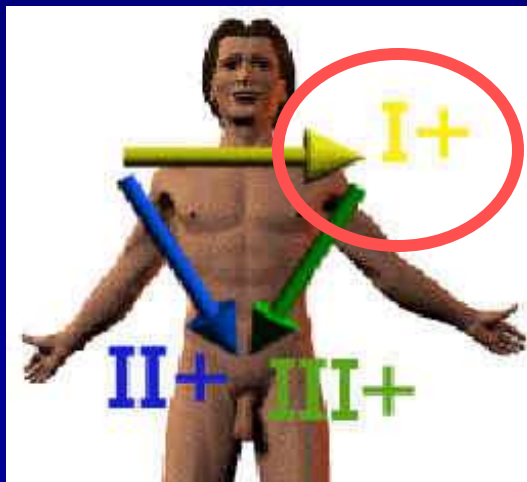


# Lateral MI

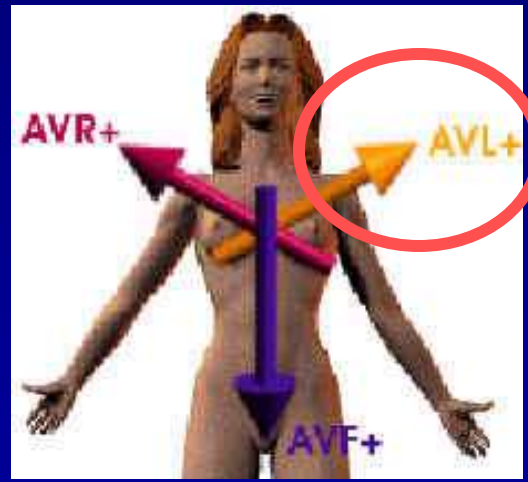
So what leads do you think the lateral portion of the heart is best viewed?

Leads I, aVL, and V<sub>5</sub>-V<sub>6</sub>

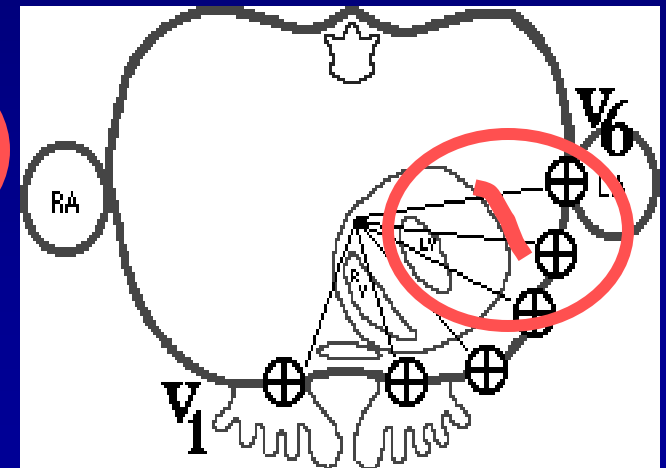
Limb Leads



Augmented Leads



Precordial Leads



# Inferior MI

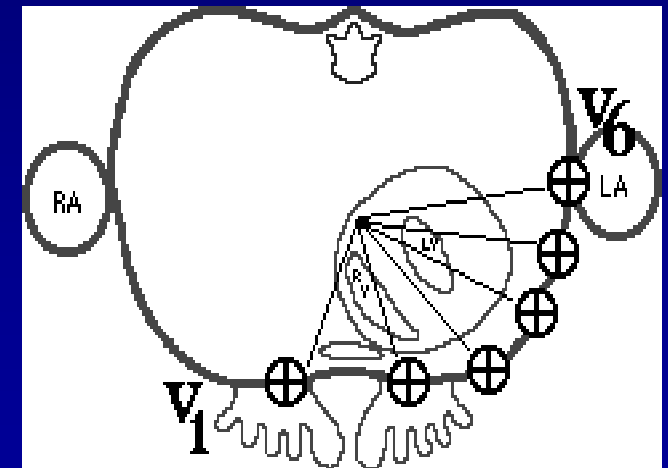
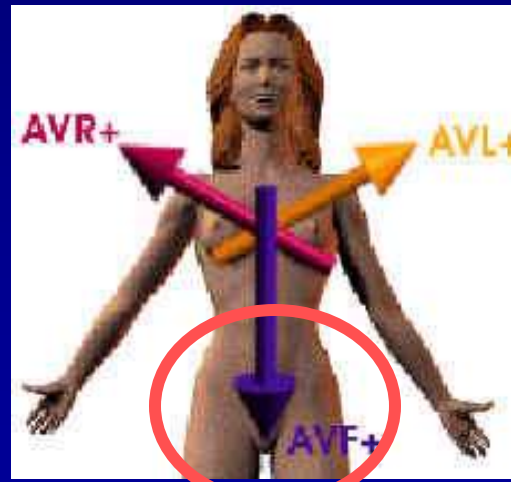
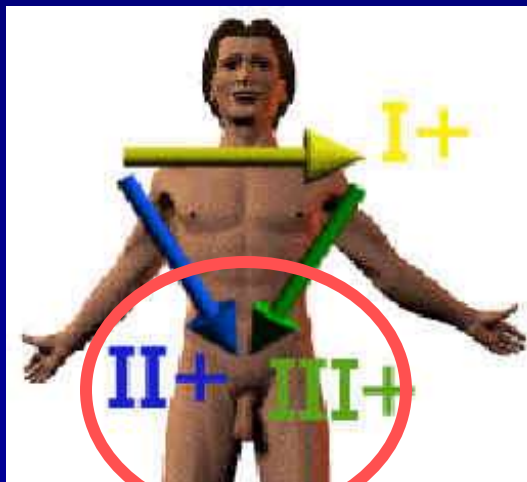
Now how about the inferior portion of the heart?

Leads II, III and aVF

Limb Leads

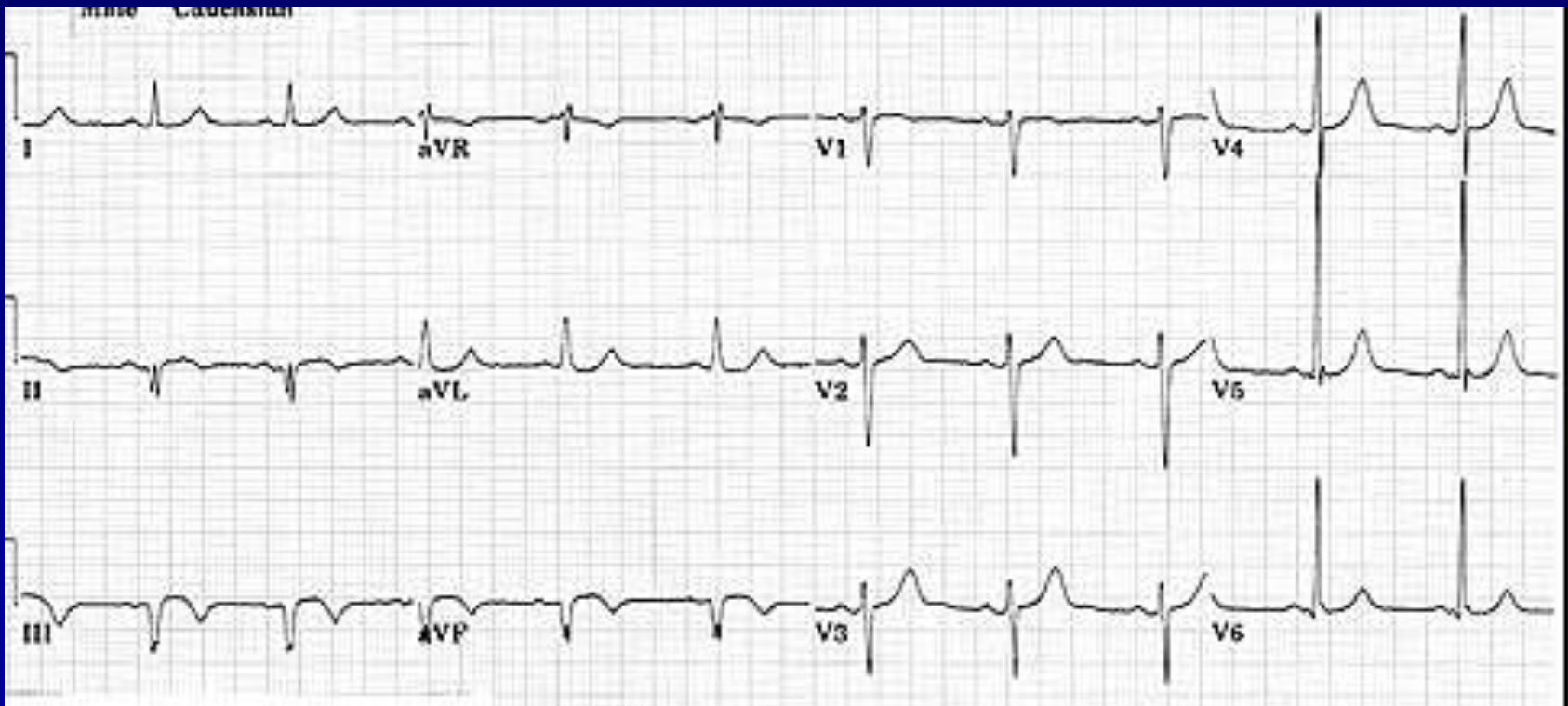
Augmented Leads

Precordial Leads



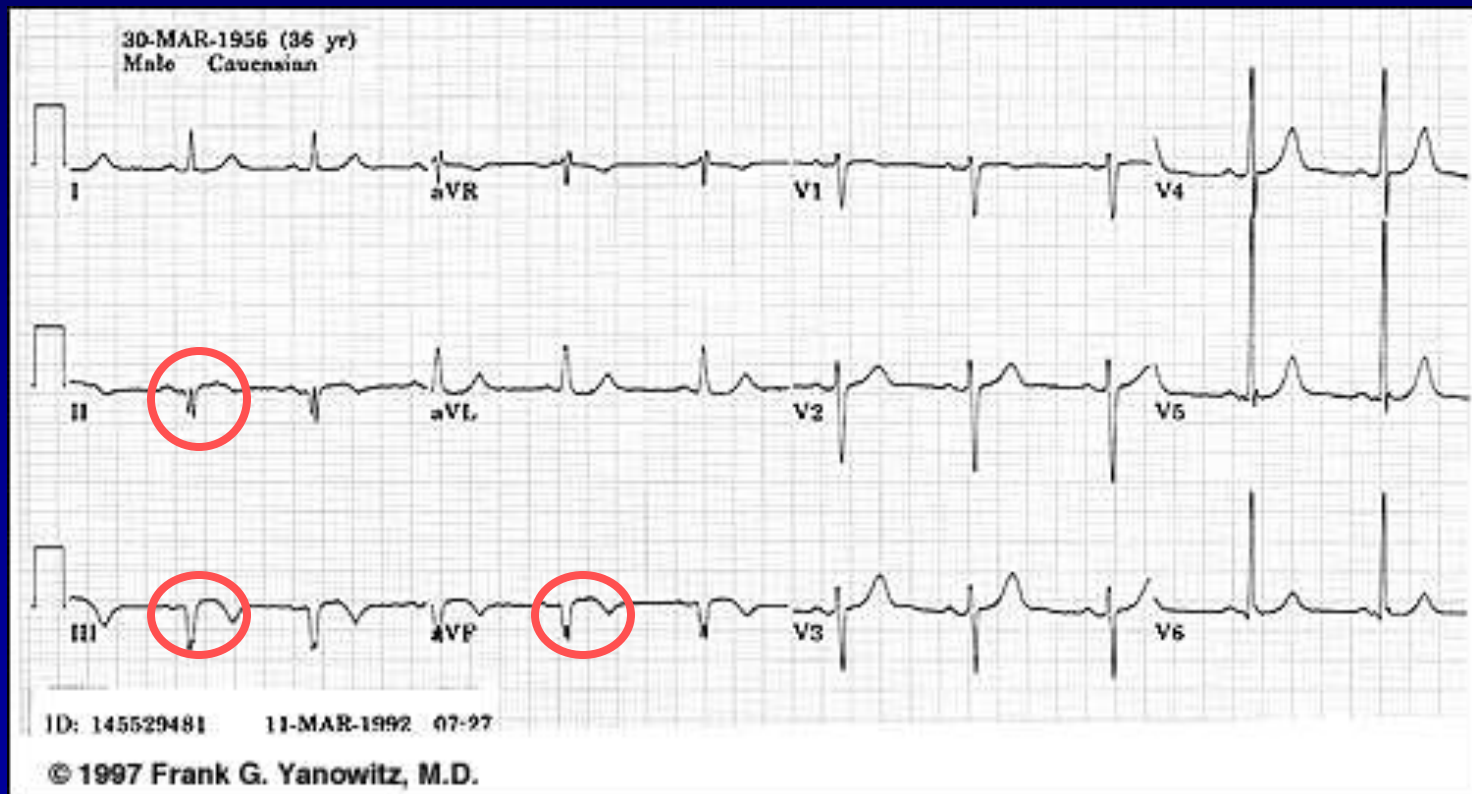
# Putting it all Together

Now, where do you think this person is having a myocardial infarction?



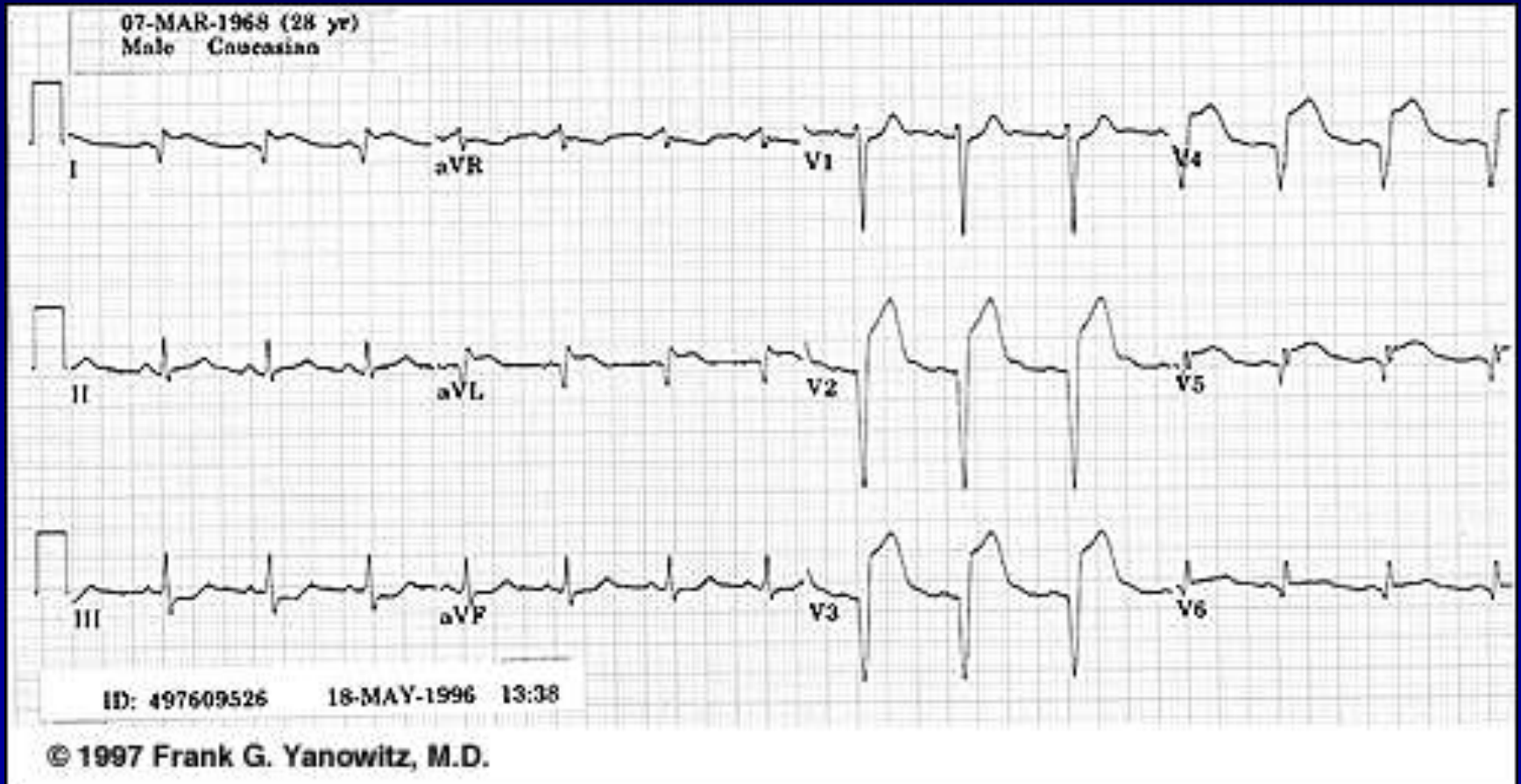
# Inferior Wall MI

This is an inferior MI. Note the ST elevation in leads II, III and aVF.



# Putting it all Together

How about now?



# Anterolateral MI

This person's MI involves **both** the anterior wall (V<sub>2</sub>-V<sub>4</sub>) and the lateral wall (V<sub>5</sub>-V<sub>6</sub>, I, and aVL)!

