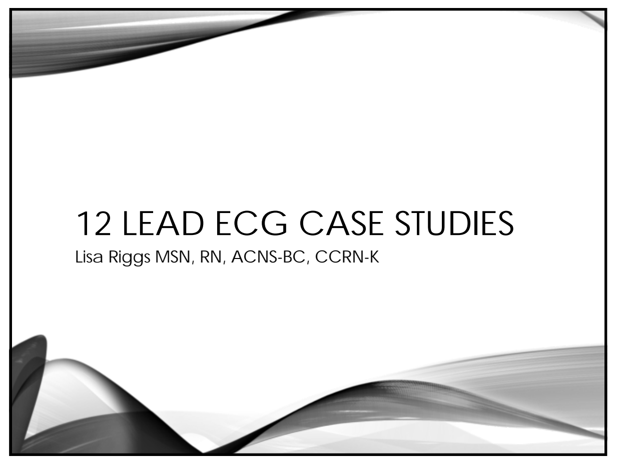
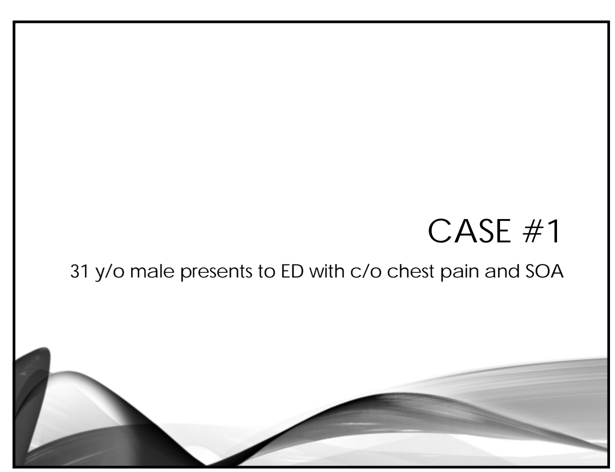
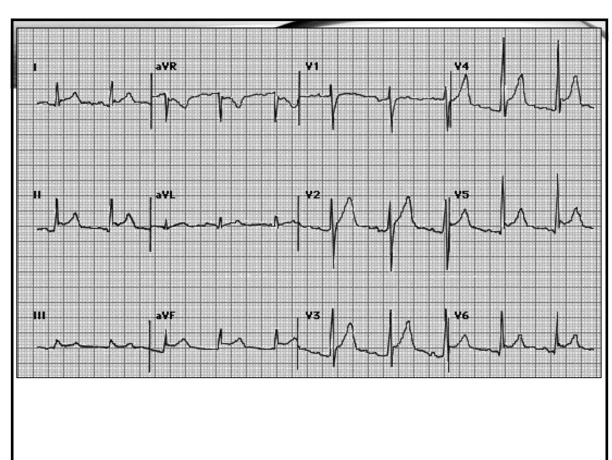
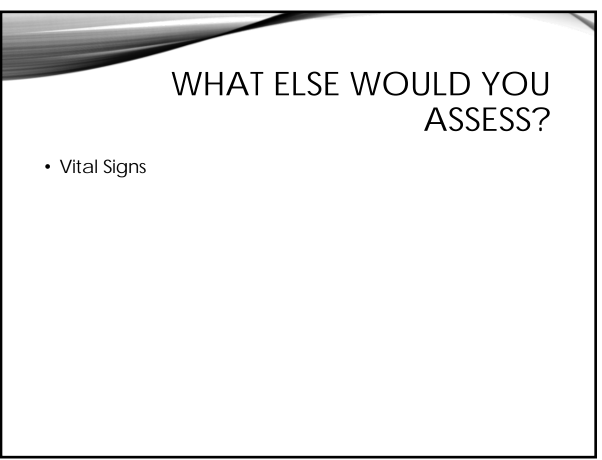




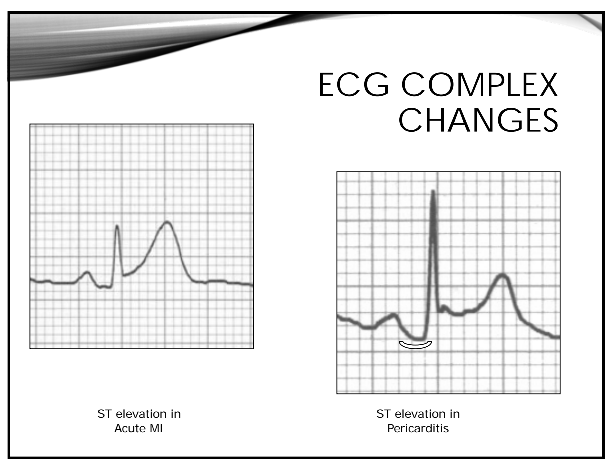




WHAT'S YOUR DIAGNOSIS?

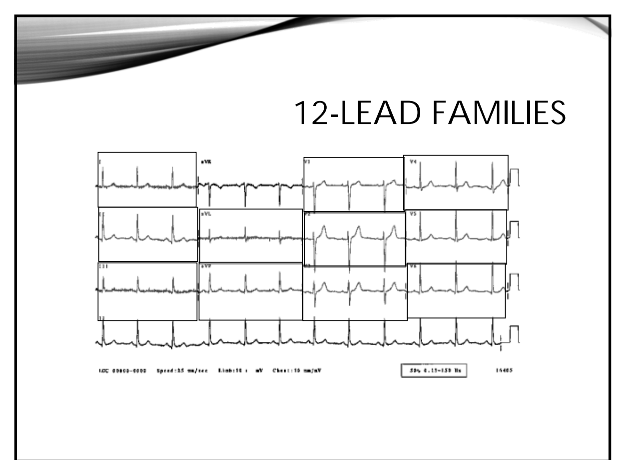
PERICARDITIS

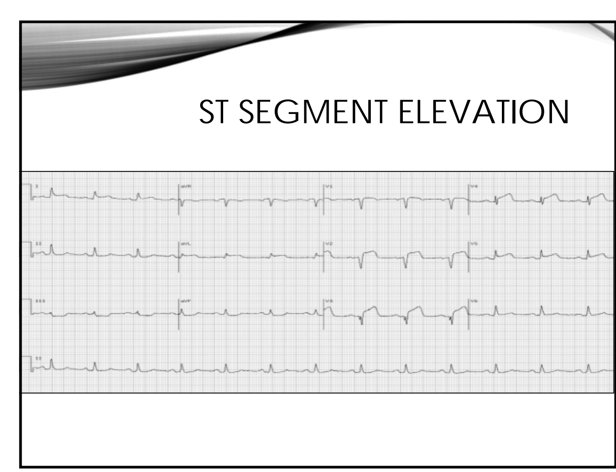
- Distinguishing features
  - ST segment elevation appears concave
  - Ventricular surface involved is greater (more leads involved)
  - PR depression may be present in all leads except aVR and V1

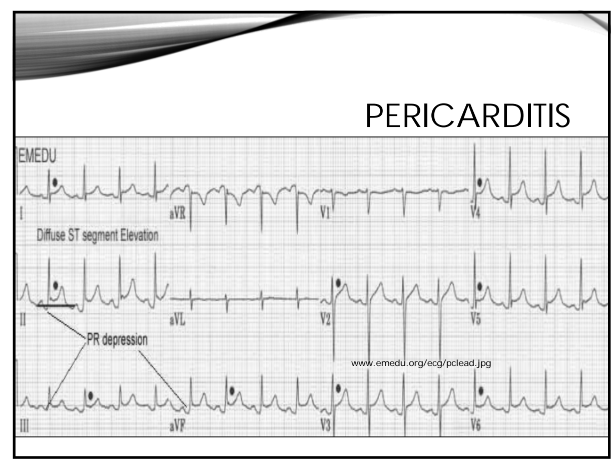


ST SEGMENT ELEVATION

- STEMI features
  - ST elevation in a few leads – grouped by "families" according to walls of heart
    - II, III, aVF – Inferior wall
    - I, aVL, V5, V6 – Lateral wall
    - V1, V2 – Septum
    - V3, V4 – Anterior wall
  - Q waves may be present
  - Reciprocal ST depression may be evident in other leads

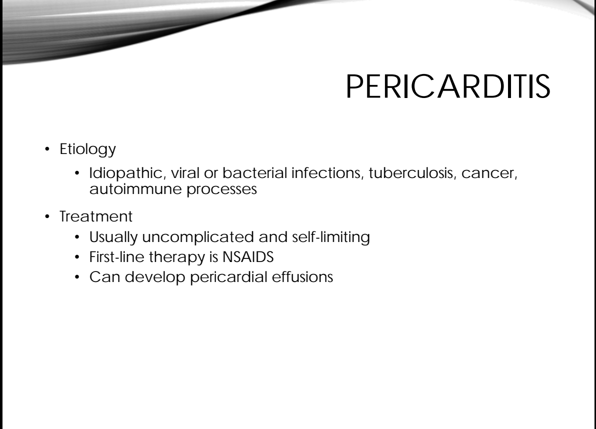


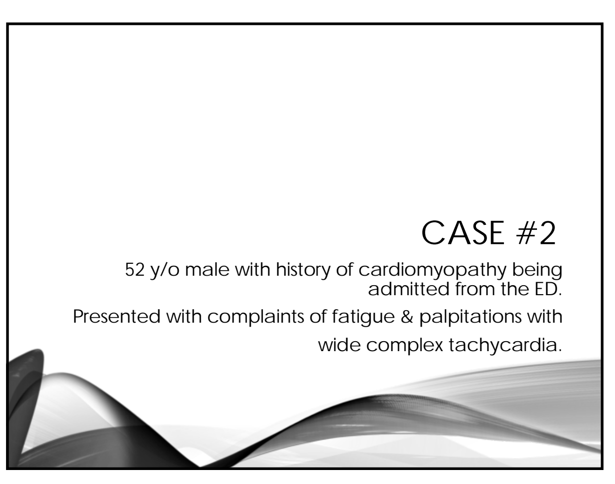


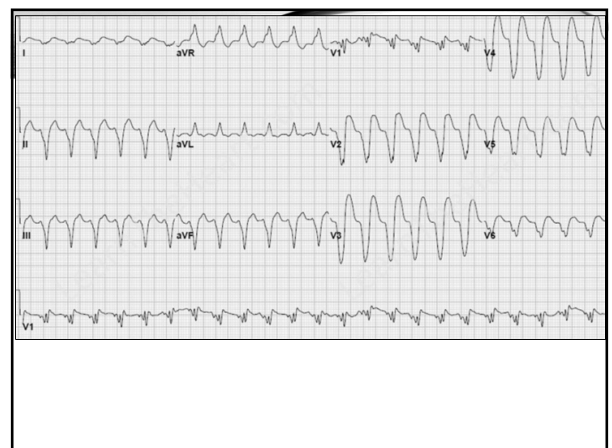


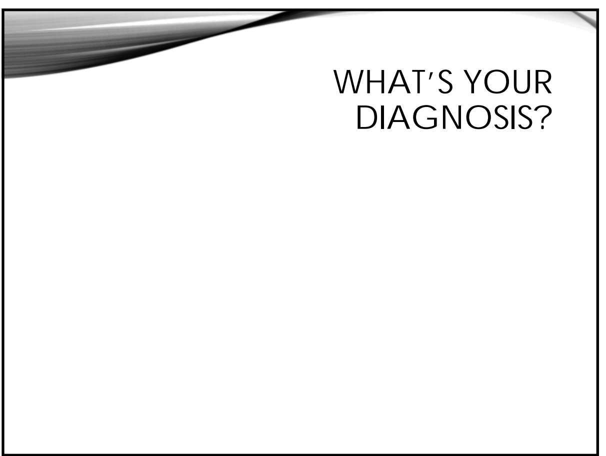
PERICARDITIS

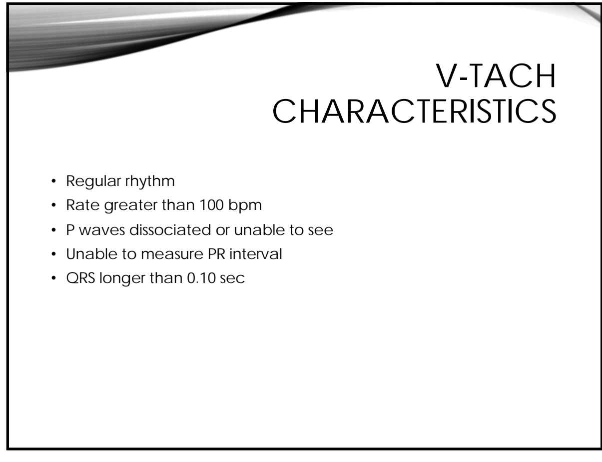
- Patient presentation:
  - Chest pain – sharp, severe, may radiate to the back, neck, shoulders.
  - Pain worse lying down and when taking a deep breath or coughing
  - Pericardial Friction Rub – scratchy, high-pitched sound. Changes in intensity with respiration. Heard best with the diaphragm of stethoscope at the lower left sternal border with the patient sitting forward

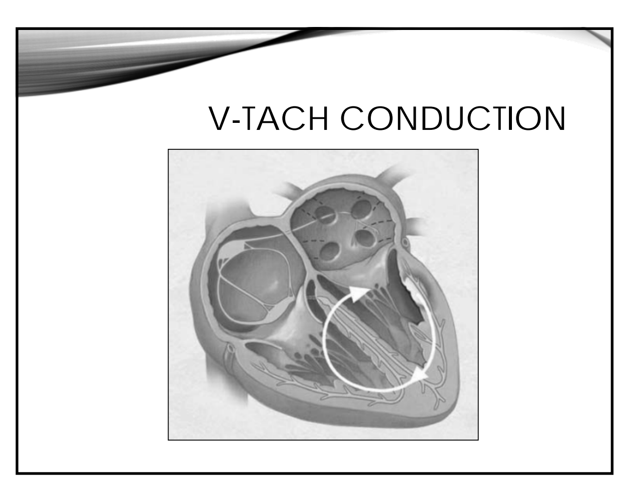

PERICARDITIS
• Etiology
• Idiopathic, viral or bacterial infections, tuberculosis, cancer, autoimmune processes
• Treatment
• Usually uncomplicated and self-limiting
• First-line therapy is NSAIDS
• Can develop pericardial effusions


CASE #2
52 y/o male with history of cardiomyopathy being admitted from the ED.
Presented with complaints of fatigue & palpitations with wide complex tachycardia.


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


WHAT'S YOUR DIAGNOSIS?


V-TACH CHARACTERISTICS
• Regular rhythm
• Rate greater than 100 bpm
• P waves dissociated or unable to see
• Unable to measure PR interval
• QRS longer than 0.10 sec

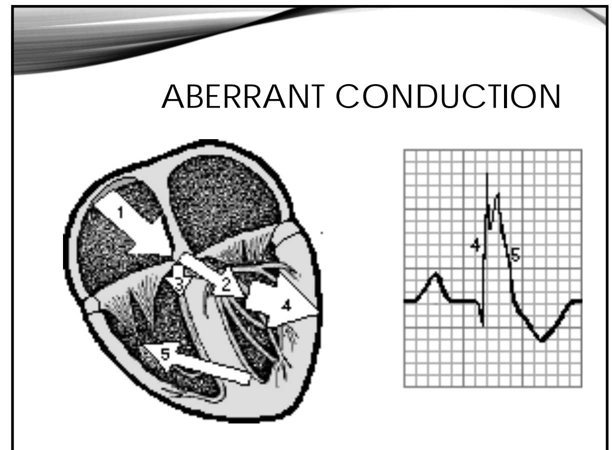

V-TACH CONDUCTION

SVT CHARACTERISTICS

- Regular rhythm
- Rate greater than 150 bpm
- Unable to distinguish P waves
- Unable to measure PR interval
- QRS 0.10 sec or less

- A-flutter, Junc Tach, Atrial Tach

ABERRANT CONDUCTION



DIFFERENTIAL CRITERIA

- History
- AV Dissociation
- QRS Width
- QRS Morphology
- QRS Axis

FACTS ABOUT V-TACH

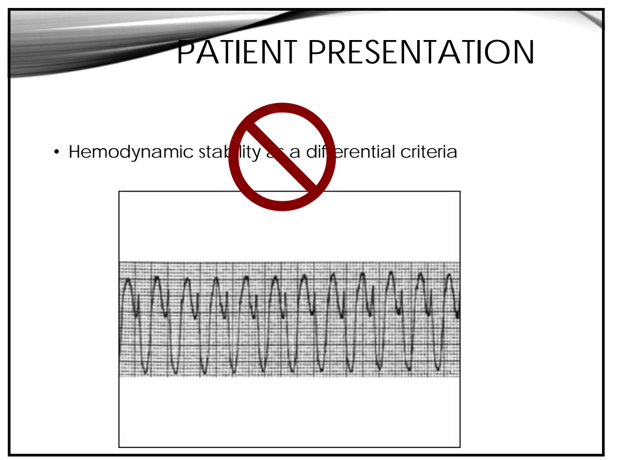
If you see a wide complex tachycardia…it's more likely to be V-tach. SVT aberrantly conducted is much less common than V-tach. One study of 150 patients with wide complex tachycardia found that 122 of those were in V-tach.

MEDICAL HISTORY

- Structural Heart Disease (95%)
  - Cardiomyopathy
  - Valve Disease
  - Congenital Heart Disease
- Myocardial Infarction (98%)

PATIENT PRESENTATION

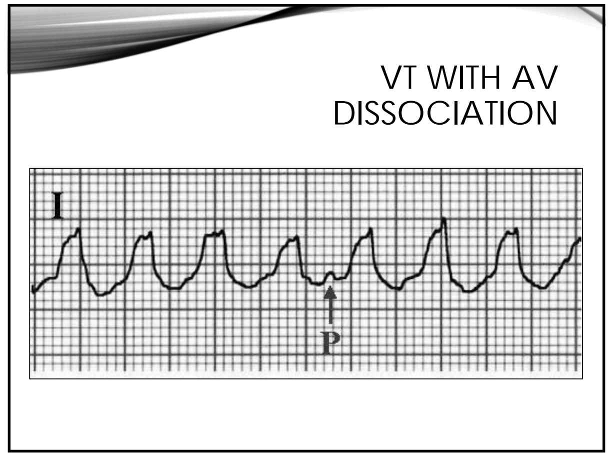
- Hemodynamic stability as a differential criteria

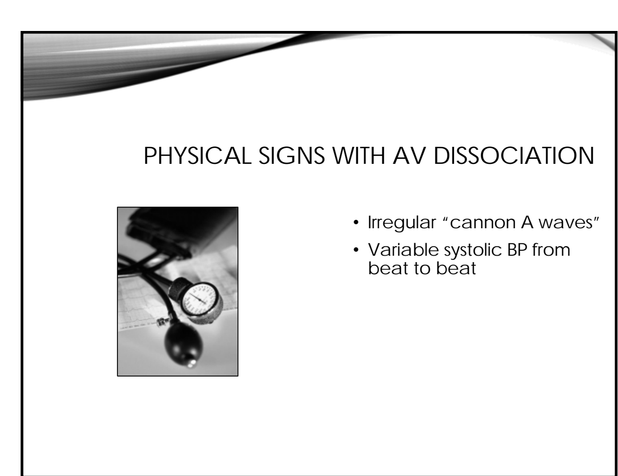


AV DISSOCIATION

- Best indicator that patient in V-tach
- Greater than 50% of patients with VT have evidence of AV Dissociation
- What to look for…
  - Check in all leads
  - Check for distortion within single cycles
  - Check for inverted P waves in II, III, aVF

VT WITH AV DISSOCIATION





PHYSICAL SIGNS WITH AV DISSOCIATION

- Irregular "cannon A waves"
- Variable systolic BP from beat to beat

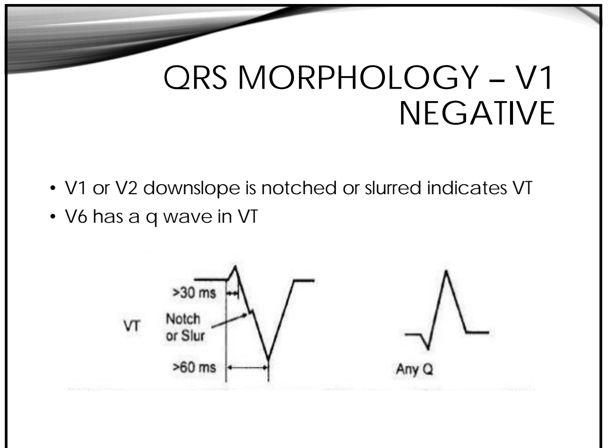
QRS WIDTH

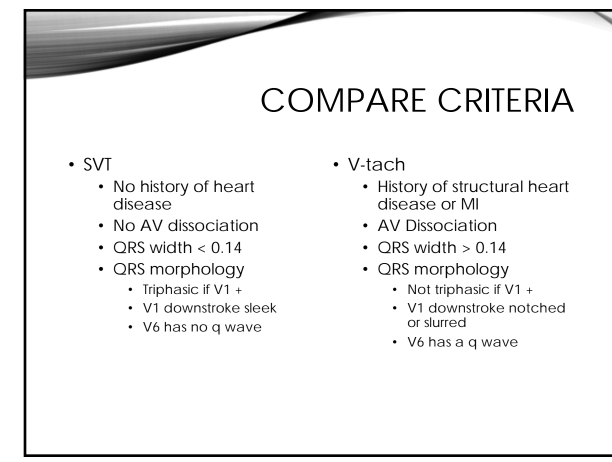
- QRS is wider than 0.10 seconds for both VT and aberrant SVT
- Usually aberrant SVT QRS width is less than 0.14 seconds
- Usually VT QRS width is greater than 0.14 seconds

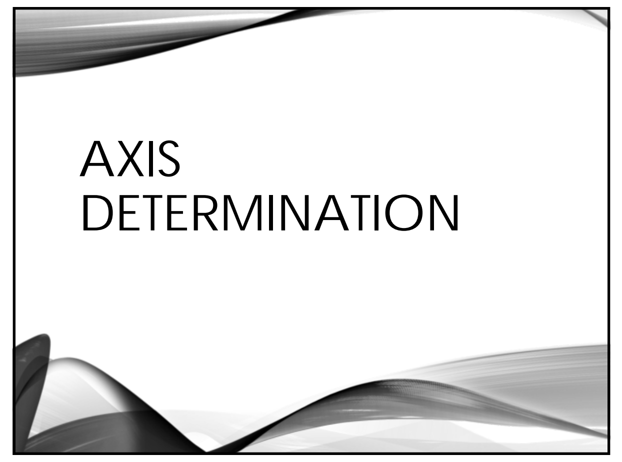
QRS MORPHOLOGY – V1 POSITIVE

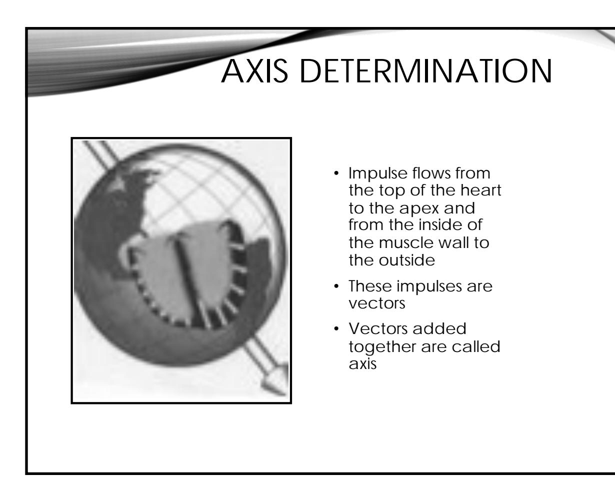
- If V1 is positive deflection…then
  - Monophasic or biphasic in VT
  - Triphasic in SVT
- V6 is qRS in SVT

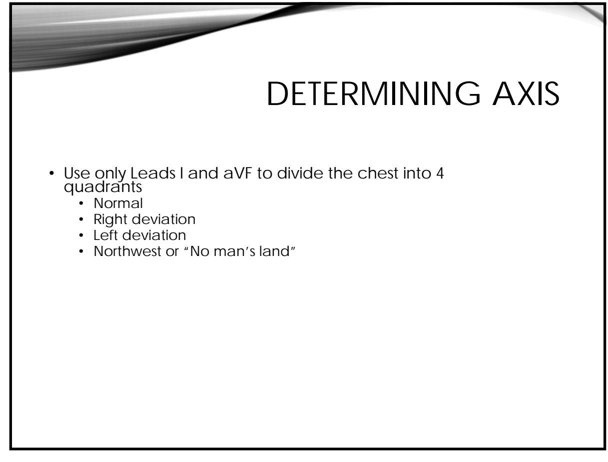
V_1 V_6
SVT
VT

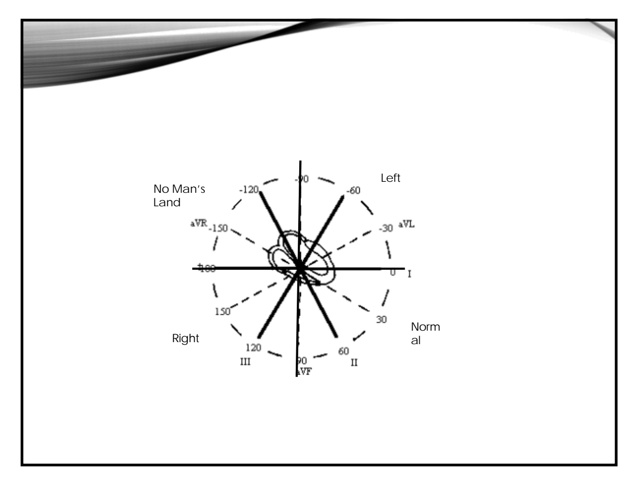

QRS MORPHOLOGY – V1 NEGATIVE
• V1 or V2 downslope is notched or slurred indicates VT
• V6 has a q wave in VT
>30 ms
VT
Notch or Slur
>60 ms
Any Q

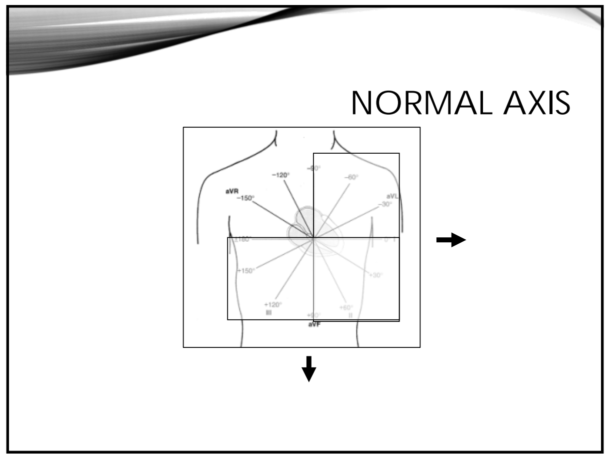

COMPARE CRITERIA
• SVT
• No history of heart disease
• No AV dissociation
• QRS width < 0.14
• QRS morphology
• Triphasic if V1 +
• V1 downstroke sleek
• V6 has no q wave
• V-tach
• History of structural heart disease or MI
• AV Dissociation
• QRS width > 0.14
• QRS morphology
• Not triphasic if V1 +
• V1 downstroke notched or slurred
• V6 has a q wave

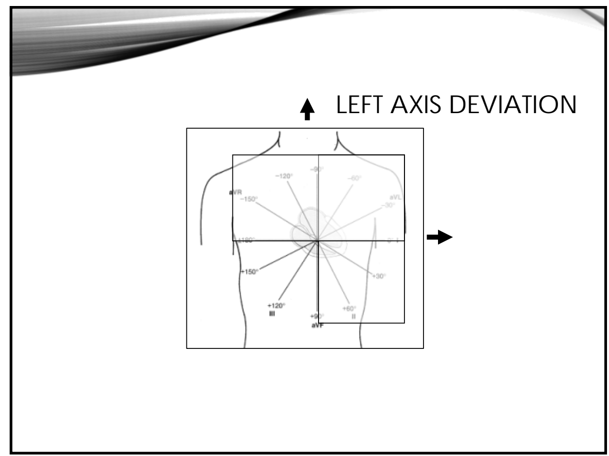

AXIS DETERMINATION

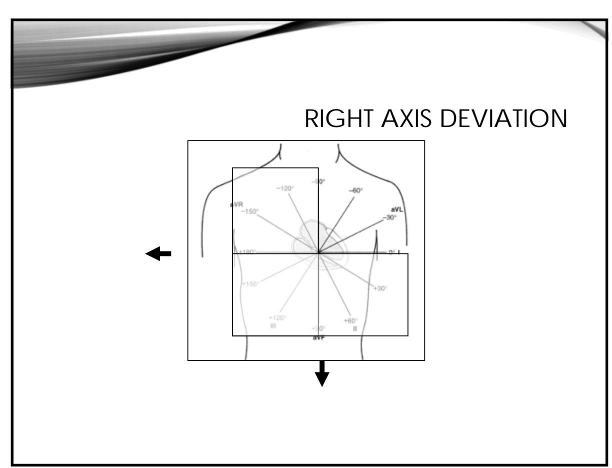

AXIS DETERMINATION
• Impulse flows from the top of the heart to the apex and from the inside of the muscle wall to the outside
• These impulses are vectors
• Vectors added together are called axis

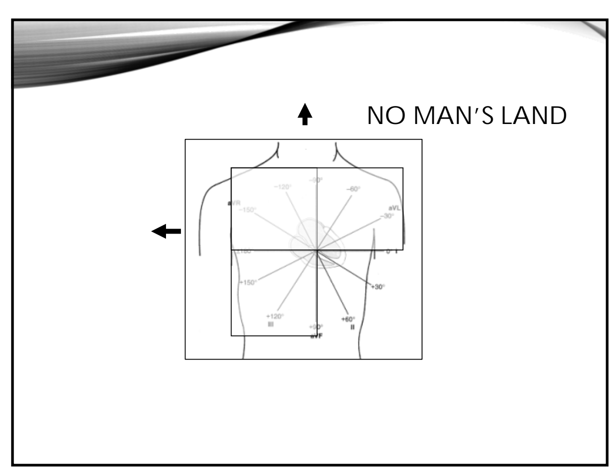

DETERMINING AXIS
• Use only Leads I and aVF to divide the chest into 4 quadrants
• Normal
• Right deviation
• Left deviation
• Northwest or "No man's land"


No Man's Land
Left
-90
-120
-60
aVR
-150
-30
aVL
0
I
150
30
Right
Norm al
120
III
90
aVF
60
II







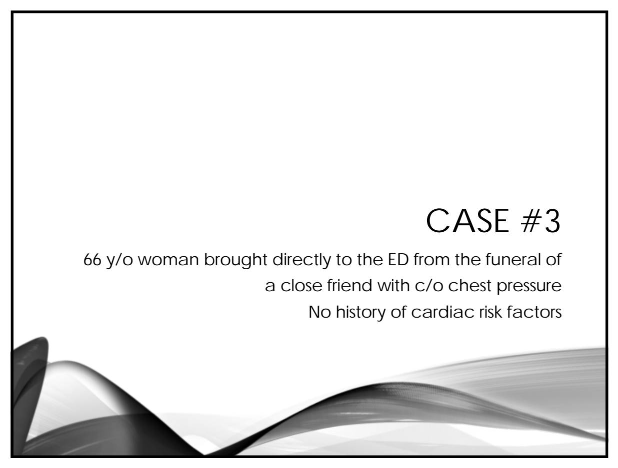


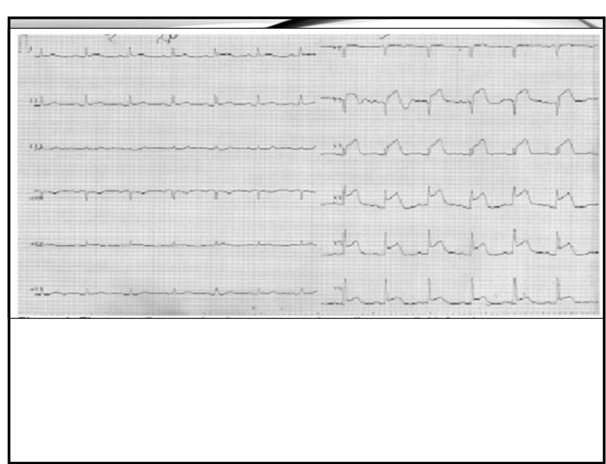
QRS AXIS FAVORING V-TACH

- Right axis deviation
  - Lead I negative
  - aVF positive
- No Man's Land
  - Lead I negative
  - aVF negative

SUMMARY OF CRITERIA FAVORING V-TACH

- Cardiac History
- AV Dissociation
- QRS width greater than 0.14 sec
- V1 and V6 positive and not triphasic
- V1 and V2 negative with notched or slurred downstroke and V6 has q wave
- Lead I is negative deflected

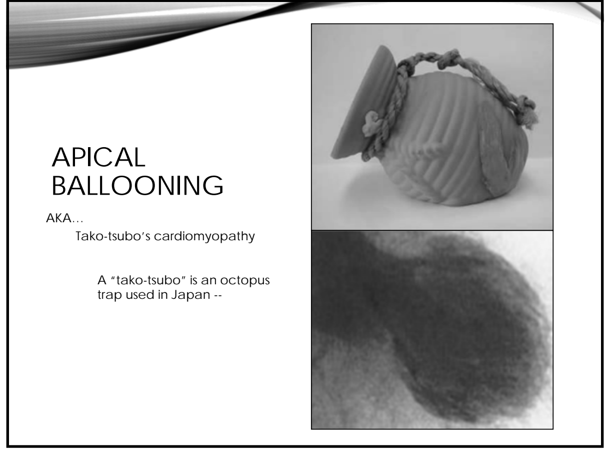


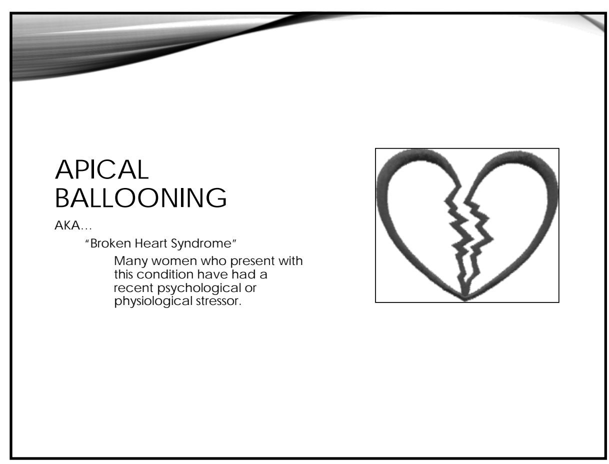


WHAT'S YOUR DIAGNOSIS?

APICAL BALLOONING

- Patient presents with chest pain, dyspnea, ECG changes and elevated enzymes
- Most are post-menopausal women, many with no CAD risk factors
- Left ventricle spontaneously normalizes within days to weeks





APICAL BALLOONING

- Emotional stressors associated with takotsubo cardiomyopathy:
  - Unexpected death of friend or relative
  - Domestic abuse
  - Confrontational argument
  - Catastrophic medical diagnosis
  - Armed robbery
  - Surprise party
- Physical stressors
  - Exacerbated systemic disorders
  - Invasive procedures
  - Asthma attack