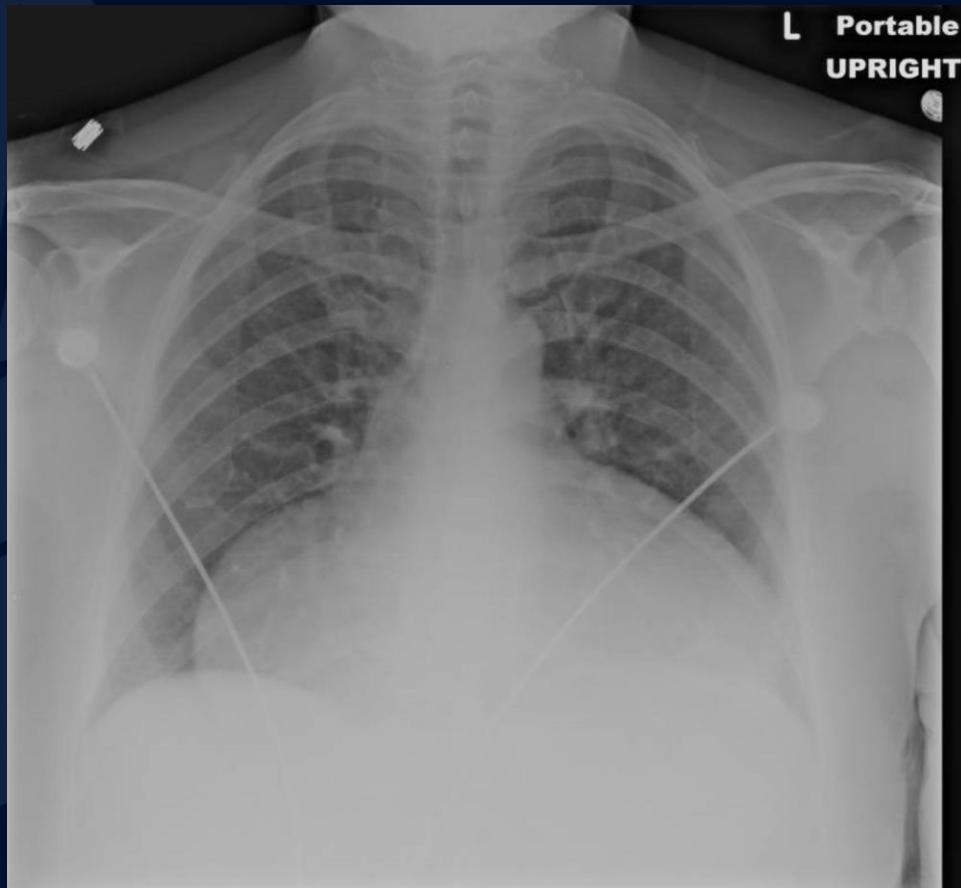


69-year-old female presents with chest pain

John J. DeBevits IV, MD





A large, stylized oak leaf graphic in a dark blue color, positioned on the left side of the slide. It features detailed vein patterns and a lobed edge.

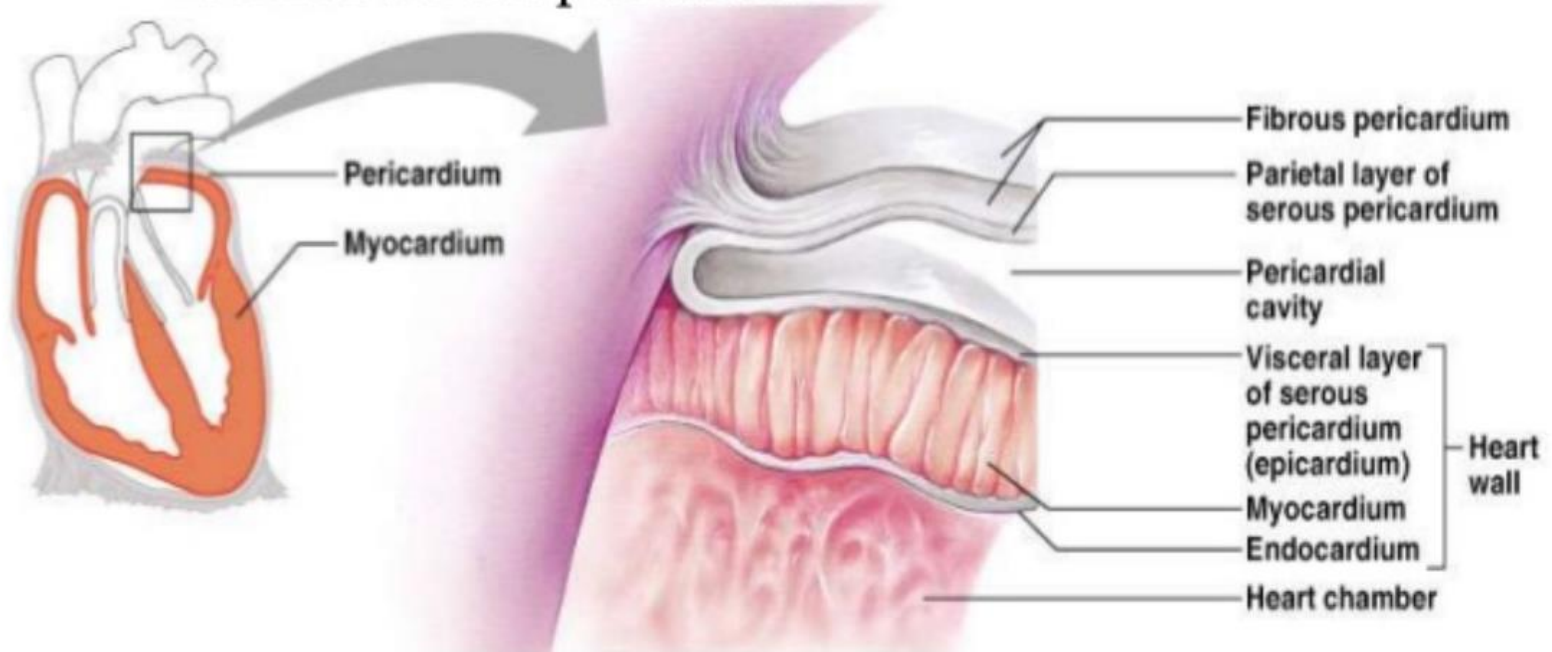
?

Pericardial effusion

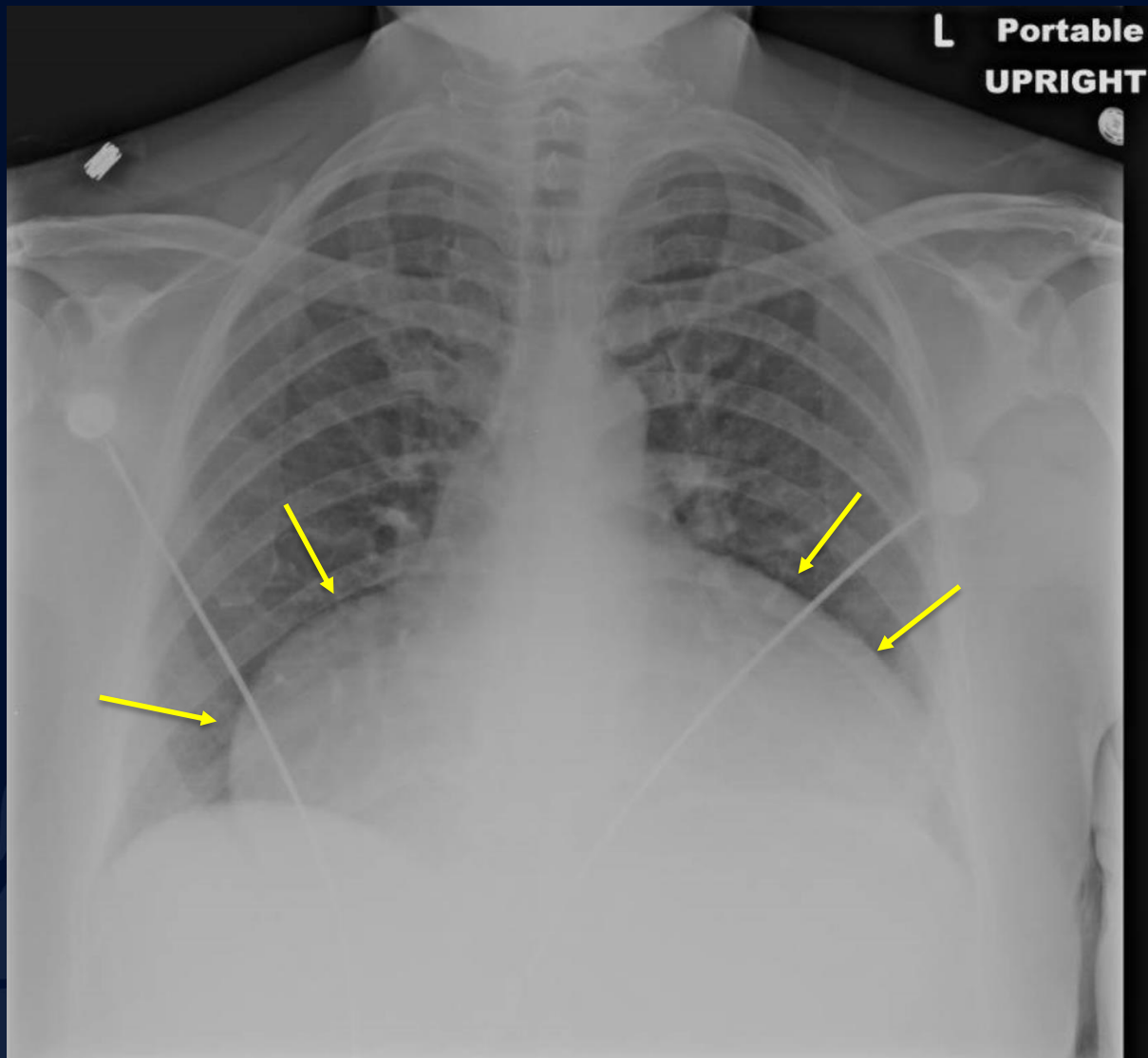
Structure of Pericardium

There are two layers to the pericardial sac:

1. Outermost fibrous pericardium
2. Inner serous pericardium

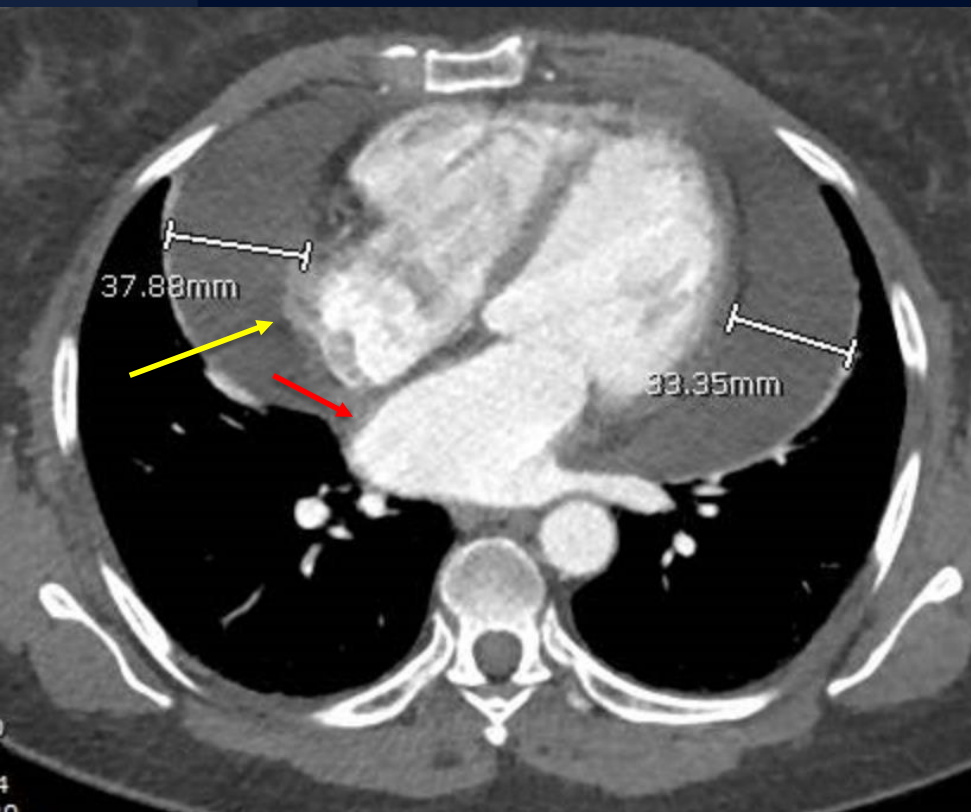


Normally 15-25mL of fluid within the pericardial sac....



“Water bottle” sign: globular enlargement of cardiopericardial silhouette

Usually indicative of $\geq 250\text{mL}$ of fluid



- Large fluid density surrounding the heart
- No significant compression of the chambers or flattening of the interventricular (IV) septum

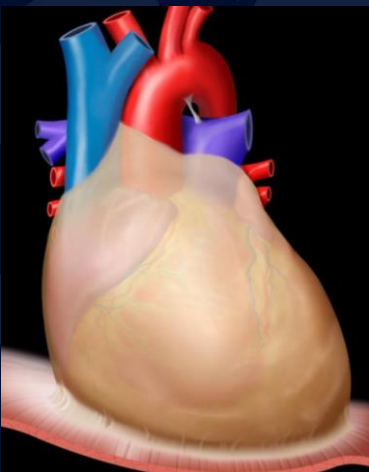


Image nicely demonstrates how the pericardium surrounds the heart, *in addition* to portions of the pulmonary trunk (red arrow), vena cava (yellow arrow), as well as ascending aorta (not shown)

Pericardial effusion

- Increased fluid in the pericardial space
- May be asymptomatic, or present with chest pain or friction rub
- Cardiac tamponade may result if the rate of fluid accumulation is dramatic
- No treatment required if effusion is small
 - Hemodialysis indicated in CKD (uremia)
 - NSAIDs for acute idiopathic/viral pericarditis
 - May require percutaneous/surgical drainage, especially in cases of tamponade

Imaging findings

- Ultrasound is imaging test of choice:
 - anechoic space between pericardial layers
 - +/- decreased pericardial contraction
 - Cardiac swing and paradoxical motion of IV septum are useful signs
- Plain film radiograph: “water bottle” sign on frontal, “fat pad,” “Oreo cookie,” “sandwich,” or “bun” signs on lateral

Imaging findings

- NECT:
 - Water attenuation pericardial fluid:
 - Heart or renal failure, malignancy
 - High-attenuation pericardial fluid:
 - Hemorrhage, purulent effusion, malignancy
 - Attenuation of hemopericardium may be high initially and decrease over time
 - High sensitivity for pericardial thickening and calcification

Imaging findings

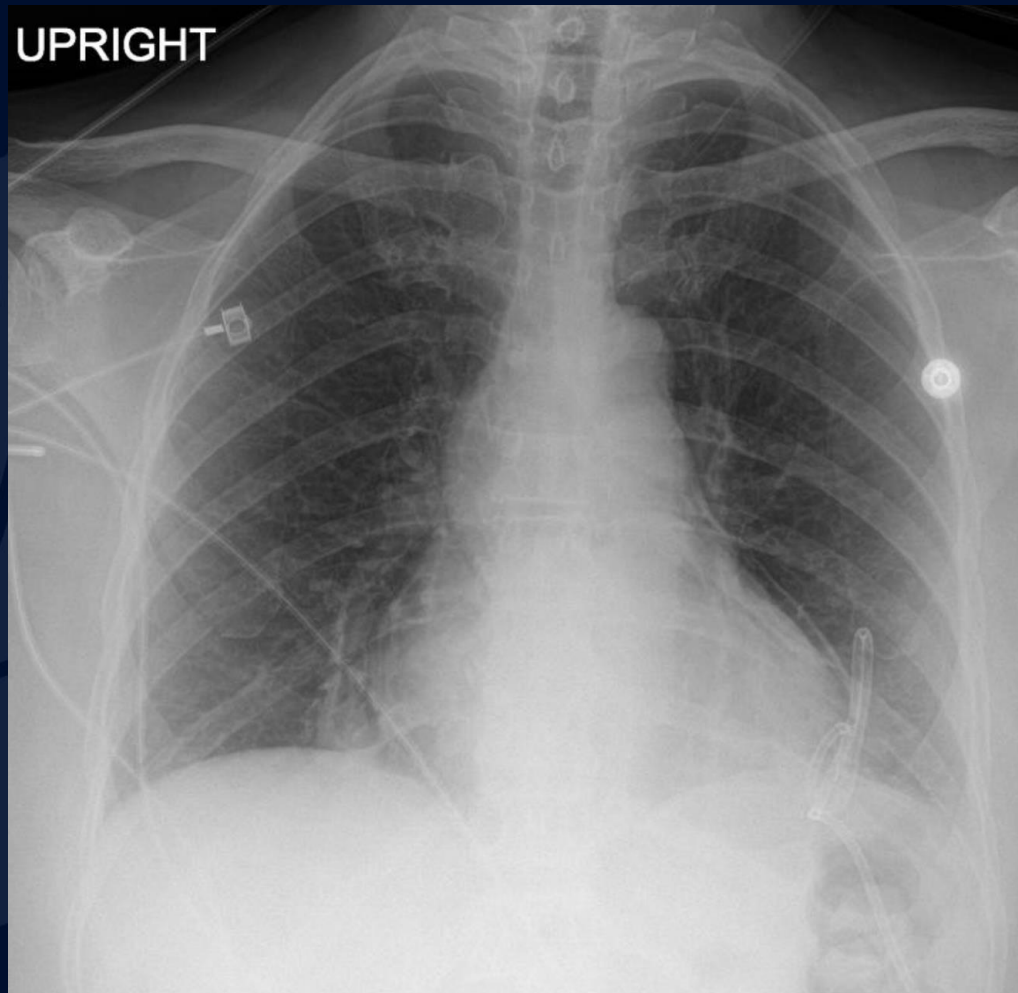
- CECT:
 - Assessment for thickening, nodules, masses
 - Pericardial enhancement/thickening from inflammation
 - Assess chambers for signs of constriction:
 - Tubular ventricles, flattened/sigmoid IV septum
 - Signs of cardiac tamponade:
 - Flattening of anterior surface of heart or right cardiac chambers, angulation/bowing of IV septum, enlarged vena cava, periportal edema, contrast reflux into IVC/azygous/hepatic/renal veins

Imaging findings

MRI:

- T1 hypointense and T2 hyperintense if uncomplicated
- Complicated effusions may demonstrate septations or debris
- Hemopericardium will demonstrate signal characteristics of blood depending on stage
- Most useful for differentiating between constrictive pericarditis (pericardial thickening $>4\text{mm}$) and restrictive cardiomyopathy

Follow-up



Follow-up Chest radiograph shows pericardial drain and pneumopericardium secondary to drainage

References

1. <https://image.slidesharecdn.com/pericardium-140904123518-phpapp02/95/anatomy-of-pericardium-6-638.jpg?cb=1409834154>
2. <http://www.ajronline.org/doi/abs/10.2214/AJR.07.7081>