



# Chest Imaging

Vascular and mediastinal  
pathologies

## Lecture 3

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Consultant Radiologist

2025-2026



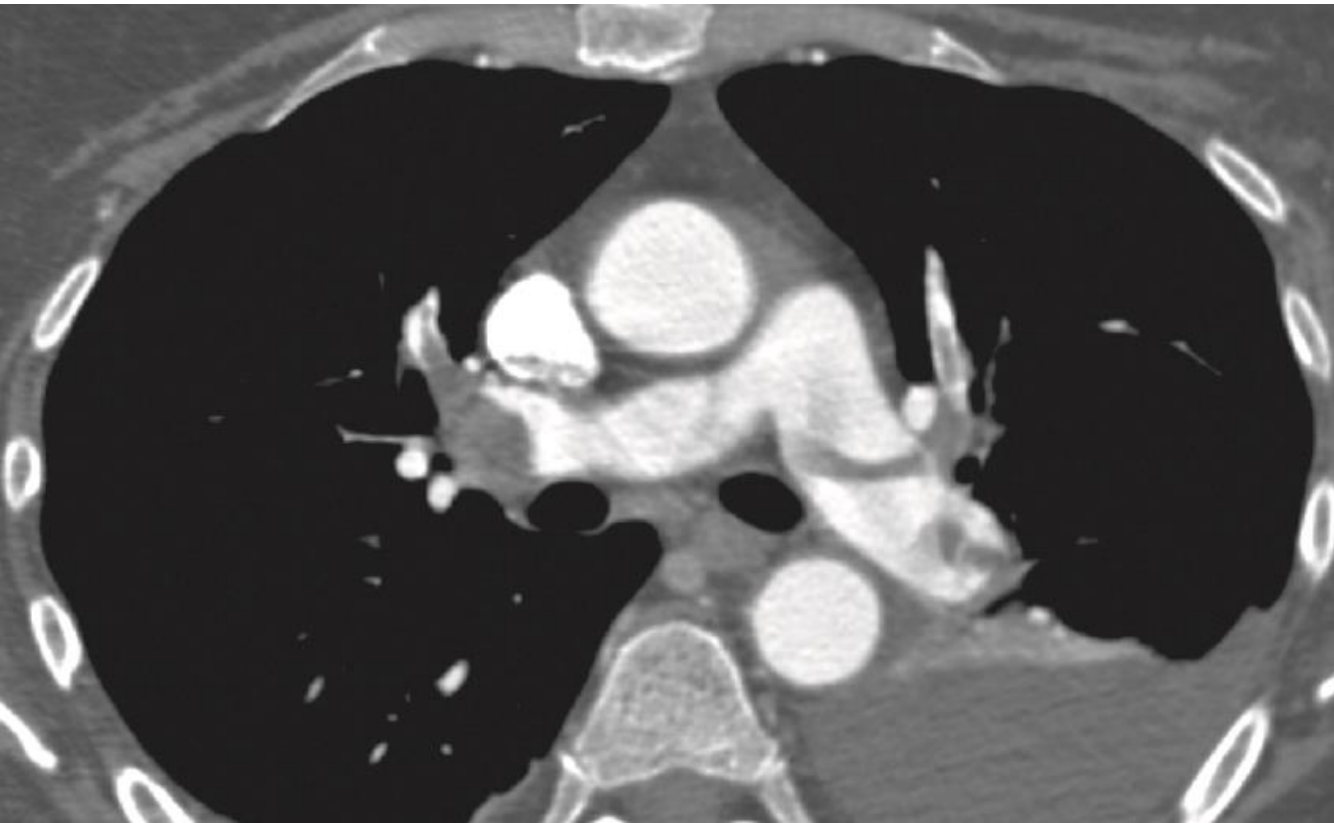


# Learning Objectives

- **By the end of this lecture, you will be able to:**
  - Identify the imaging findings of pulmonary embolism on CTPA.
  - Differentiate cardiogenic from non-cardiogenic pulmonary edema.
  - Generate a differential diagnosis for a mediastinal mass based on its location.
  - Describe the patterns of Interstitial Lung Disease (ILD) on HRCT.

# Pulmonary Embolism (PE)

- **Imaging Test of Choice:** CT Pulmonary Angiography (CTPA).
- **Direct Signs:** Filling defect within a contrast-opacified pulmonary artery.
  - "Railway track" sign (contrast around a clot).
  - Complete arterial cutoff.
- **CXR Role:** Often normal. Used to exclude other causes of chest pain. May show infarction (wedge-shaped consolidation).



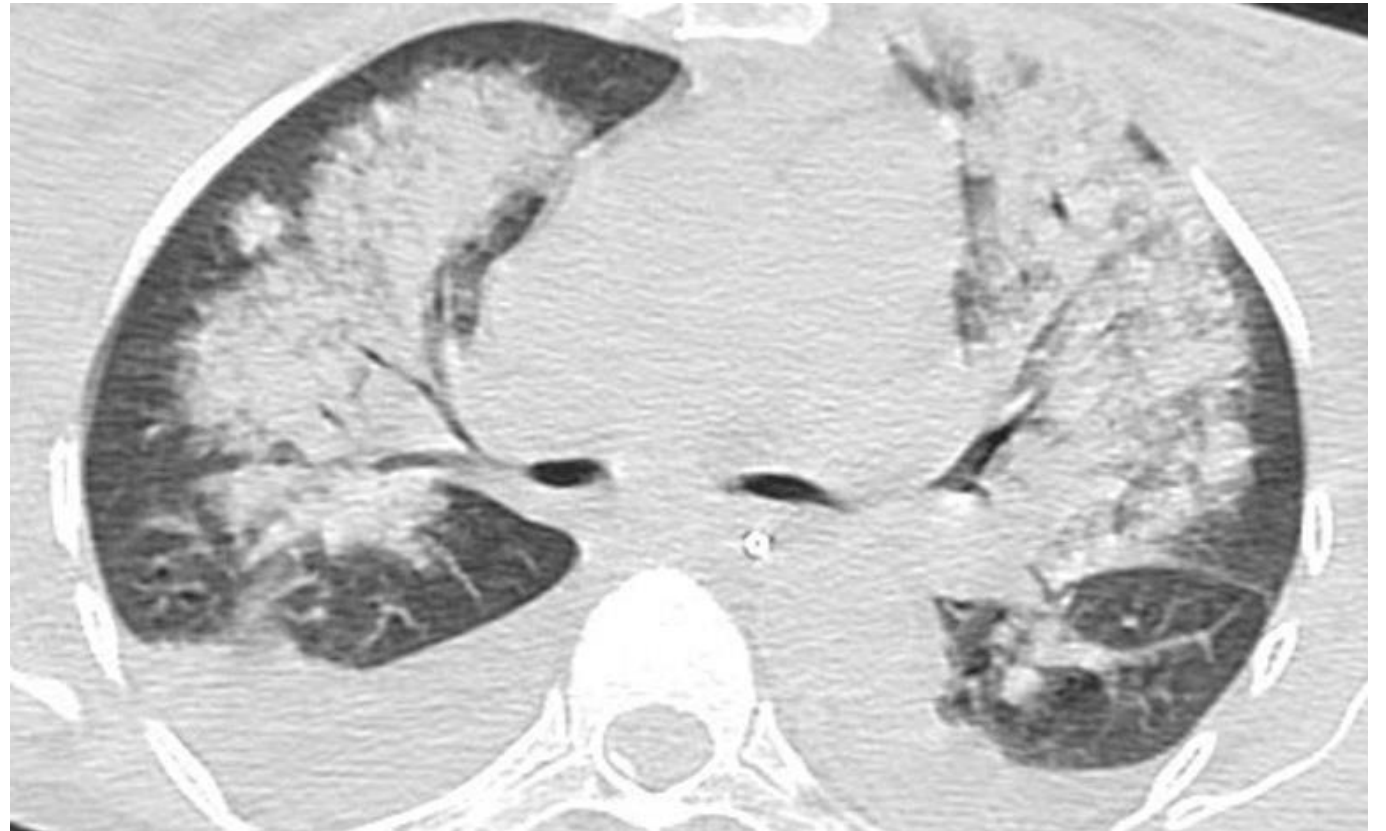
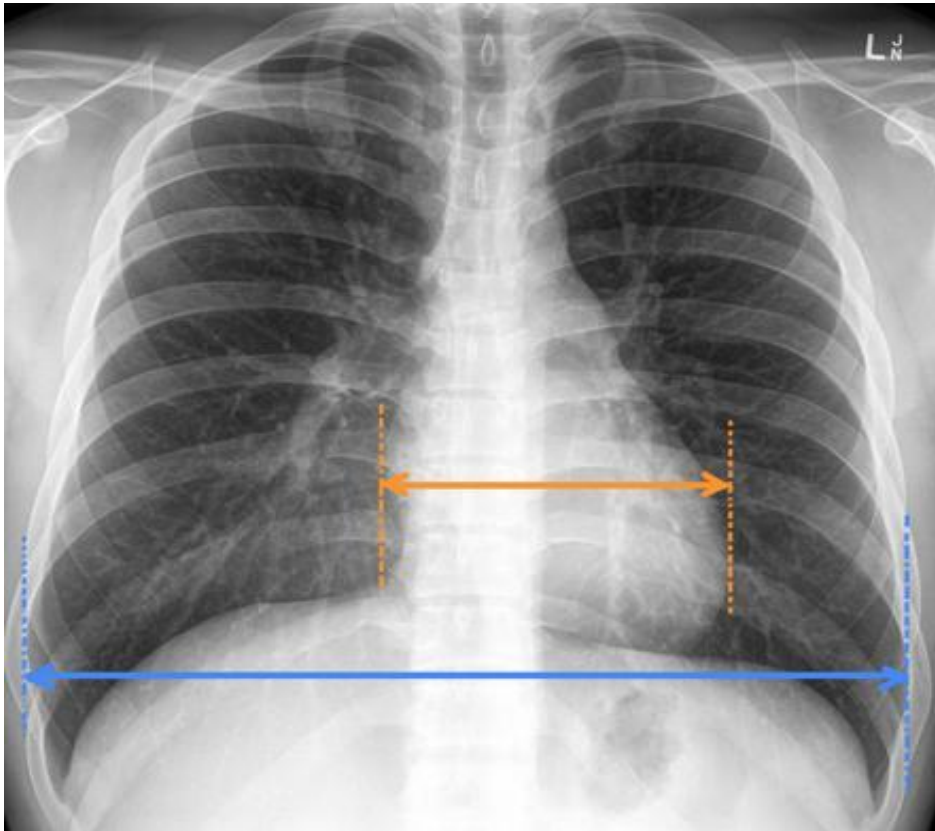
# Pulmonary Edema: Cardiogenic

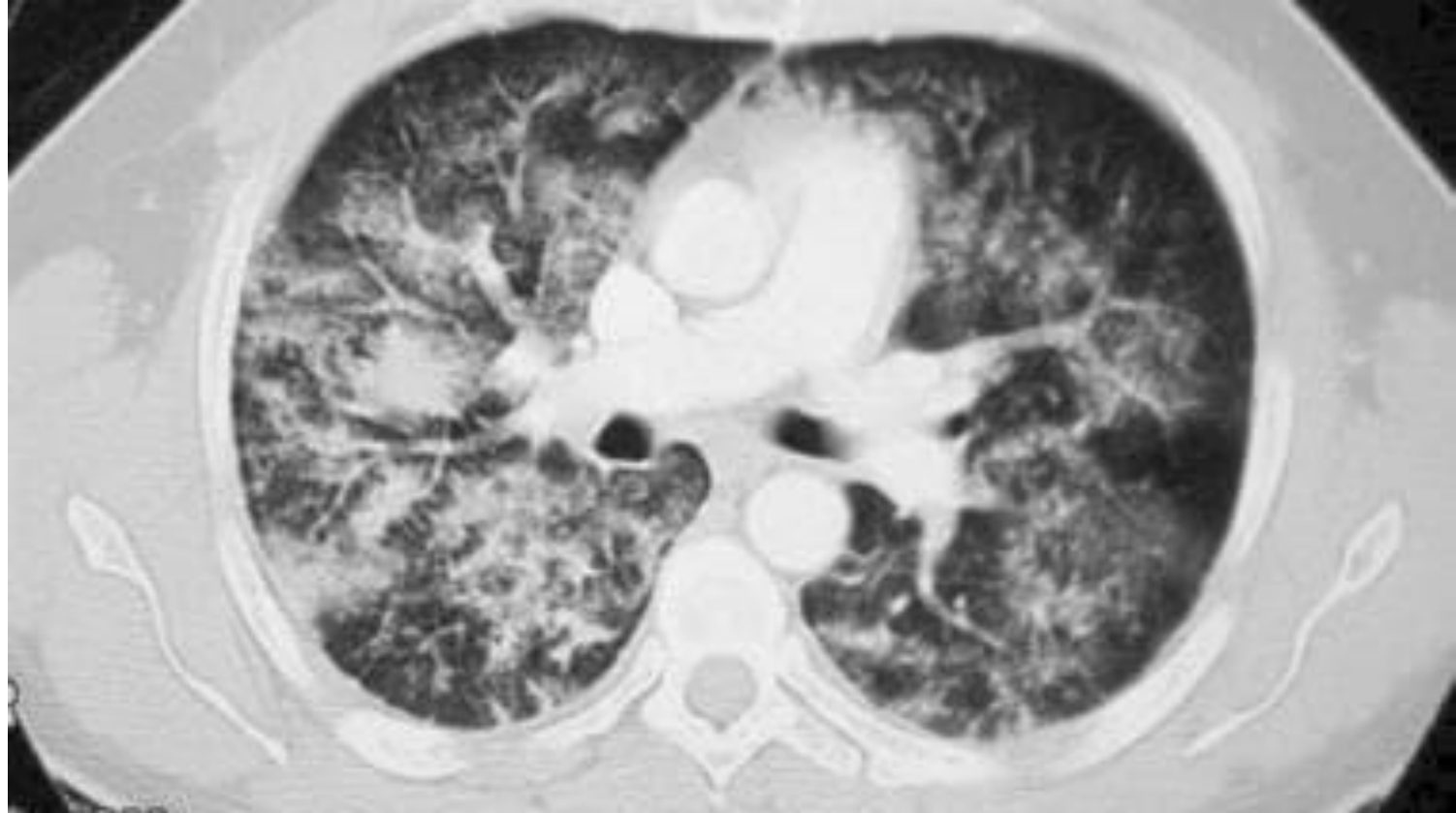
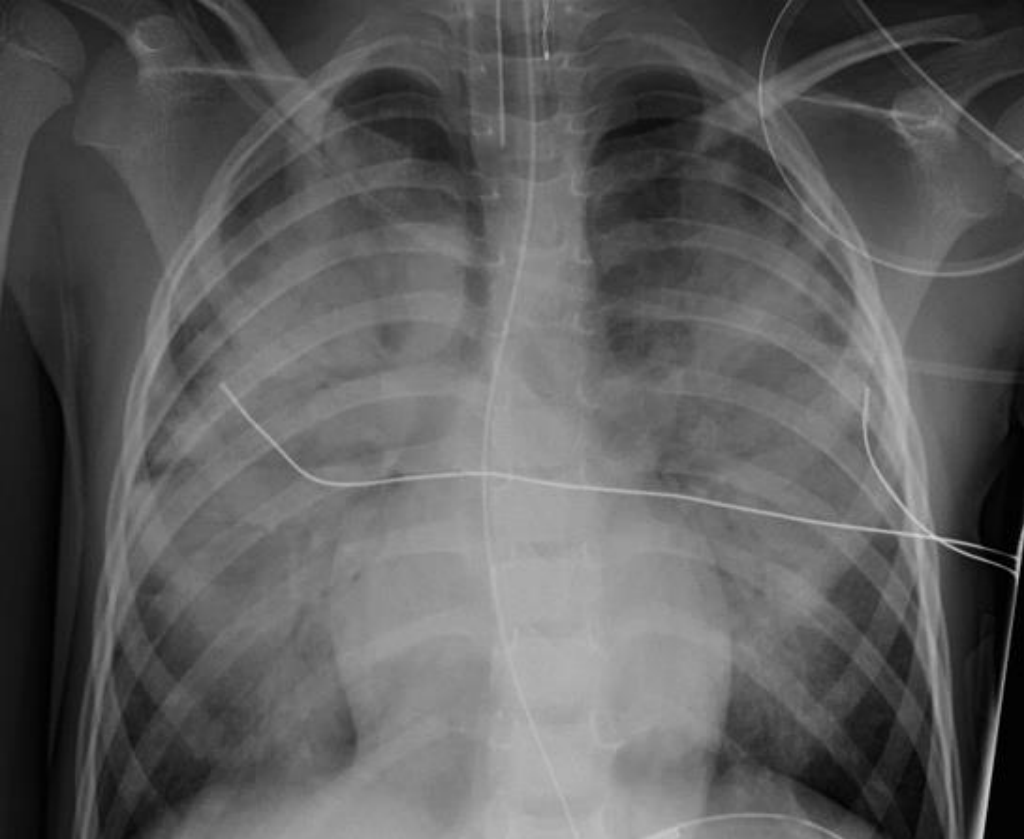
- **Pathology:** Hydrostatic edema from left heart failure.
- **CXR Sequence of Events:**
  - **Cephalization:** Redistribution of blood to upper lobe vessels.
  - **Interstitial Edema:** Kerley B lines, peribronchial cuffing.
  - **Alveolar Edema:** Bilateral, perihilar "bat wing" opacities.
  - Pleural effusions.
- **Other Signs:** Cardiomegaly.



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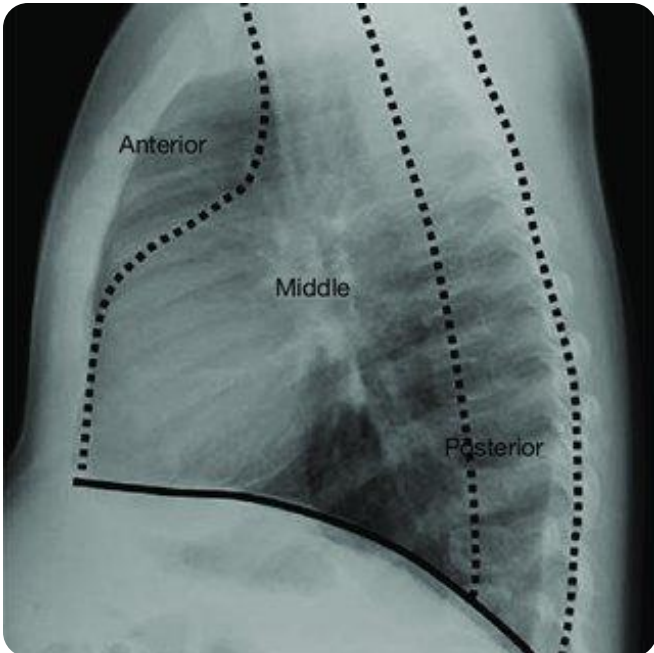
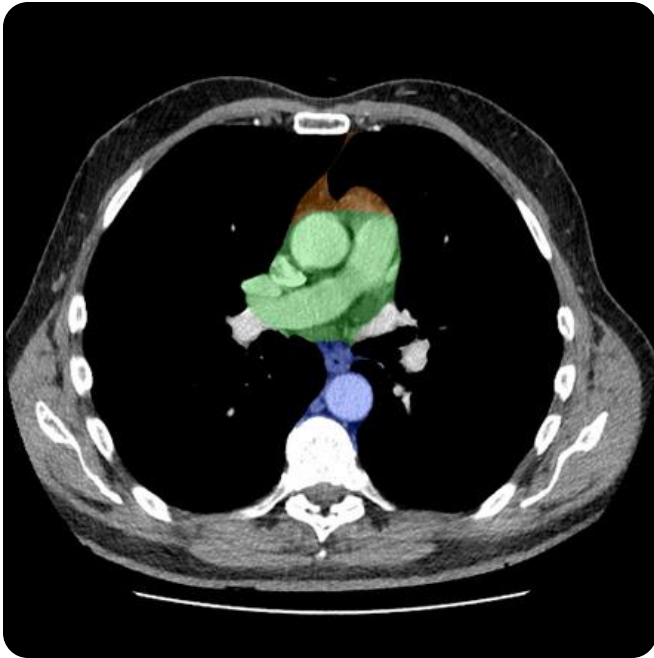




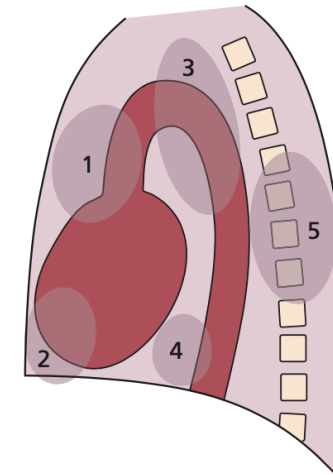
## Pulmonary Edema: Non-Cardiogenic (ARDS)

- **Pathology:** Permeability edema from alveolar-capillary membrane injury (e.g., sepsis, trauma).
- **CXR Findings:**
  - Diffuse bilateral airspace opacities.
  - **Heart size is normal.**
  - No cephalization.
- **Clinical Context is Key.**
- **CT:** Widespread ground-glass opacities.

# The Mediastinum: Compartment Approach



- **Why?** Location narrows the differential diagnosis.
- **Anterior Mediastinum (The 4 Ts):**
  - Thymoma
  - Teratoma/Germ Cell
  - Thyroid (goitre) - moves with swallowing
  - Terrible Lymphoma
  - **Middle Mediastinum:** Lymphadenopathy, Bronchogenic Cyst.
- **Posterior Mediastinum:** Neurogenic Tumors.



## ANTERIOR

1. Thyroid tumour  
Thymic tumour or cyst  
Teratoma/Dermoid cyst  
Lymphadenopathy  
Aortic aneurysm

2. Pericardial cyst  
Fat pad  
Morgagni hernia

## MIDDLE

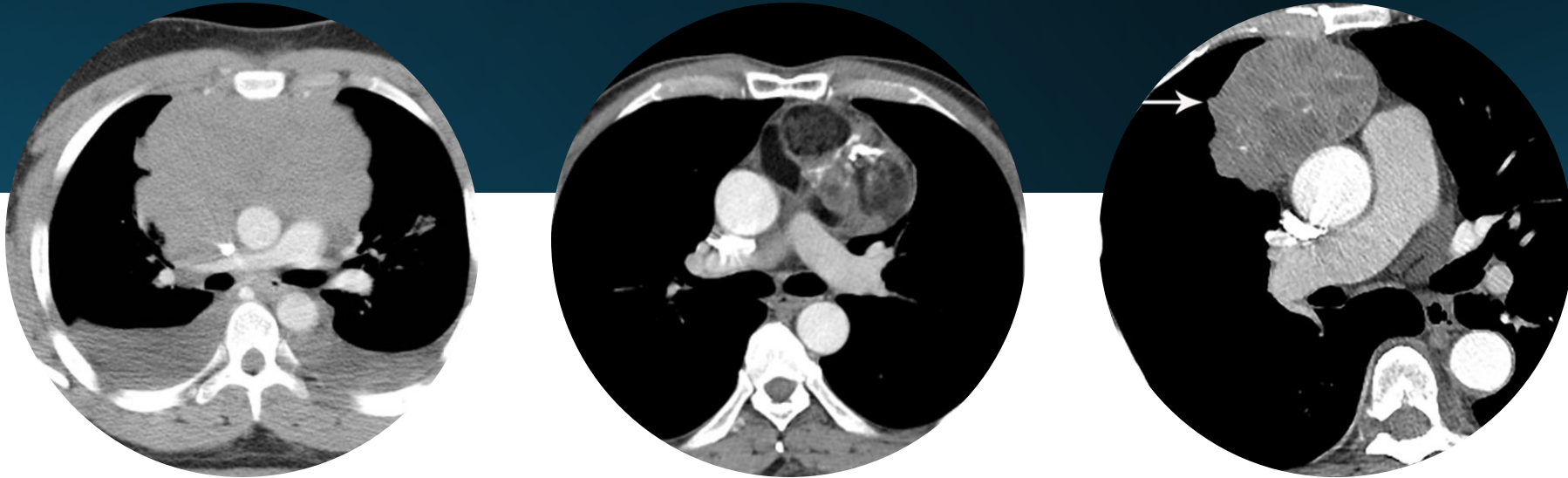
3. Thyroid tumour  
Lymphadenopathy  
Bronchogenic cyst  
Aortic aneurysm

4. Hiatus hernia

## POSTERIOR

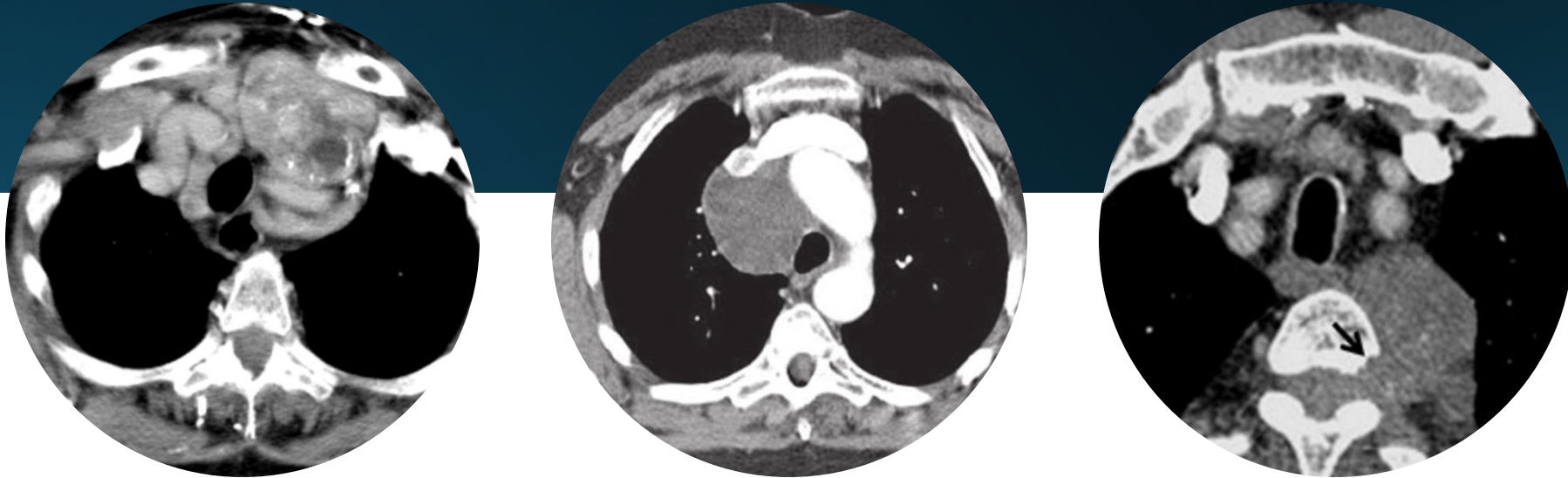
5. Neurogenic tumours  
Soft tissue mass of infection or neoplasm  
Lymphadenopathy  
Aortic aneurysm

# Mediastinal Masses: Role of CT



- CT is superior for localization and characterization.
- **Density Clues on CT:**
  - **Fat:** Negative Hounsfield Units (HU) - e.g., fat pads, teratoma.
  - **Fluid:** 0-20 HU - e.g., bronchogenic cyst.
  - **Soft Tissue:** 20-50 HU - e.g., lymphoma, thymoma.
  - **Calcification:** High HU - often benign.
  - **Vascular Enhancement:** Bright with contrast - confirms aneurysm.

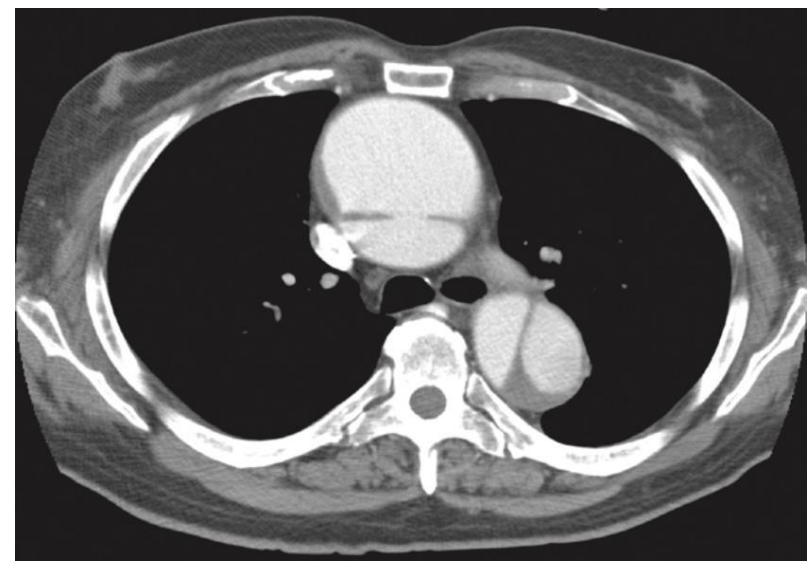
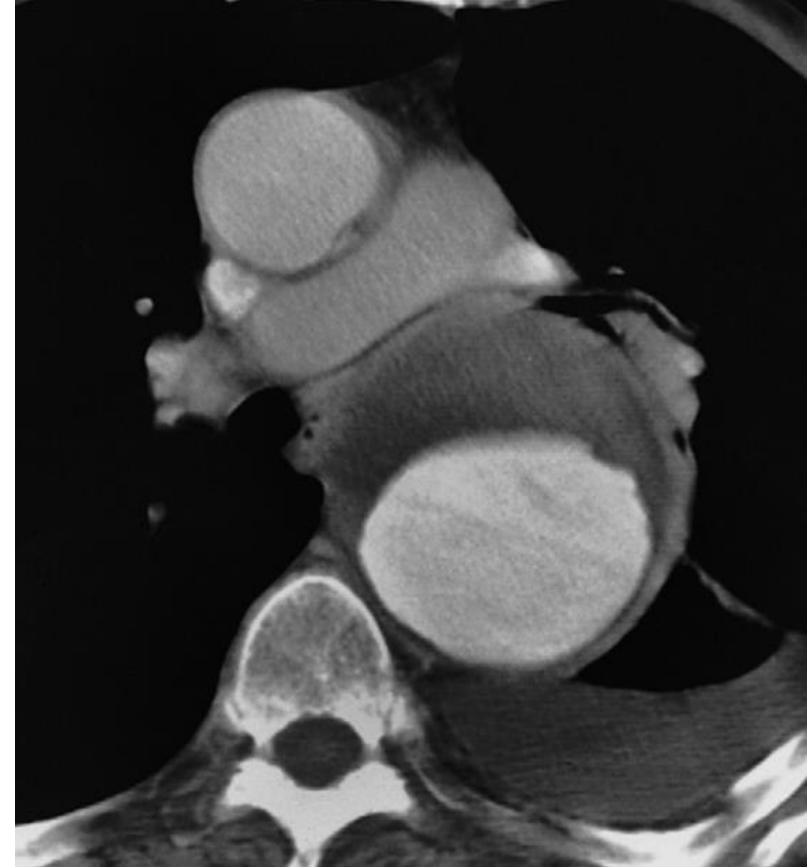
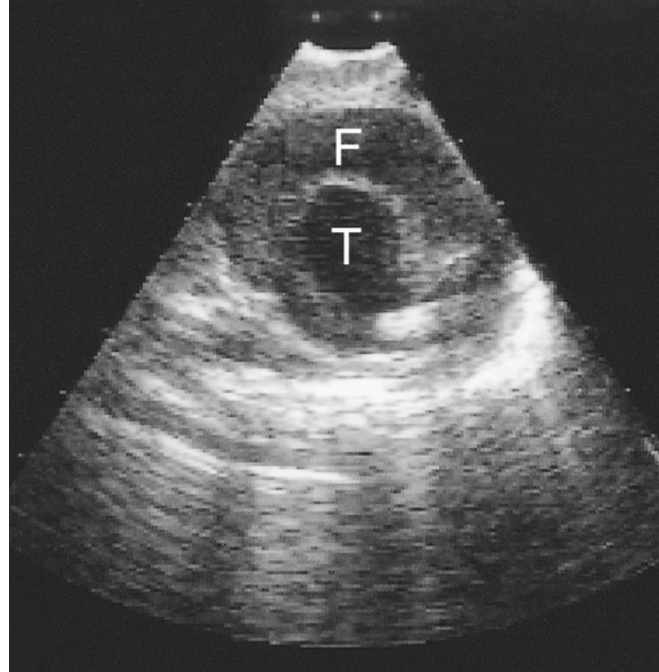
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## Aortic Aneurysm & Dissection

- **Atheromatous Aneurysm:** Often calcified on CXR. CT with contrast shows dilated lumen and thrombus.
- **Aortic Dissection:** Tear in the intima creating true and false lumens.
  - **Imaging:** CT Angiography, MRI, Transoesophageal Echo.
  - **Key Question:** Does it involve the ascending aorta (Type A)? This requires surgery.



# Summary & Key Takeaways

CTPA is the test for PE.

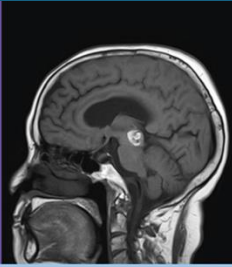
Cardiogenic edema: Heart enlarged, cephalization.

Non-cardiogenic (ARDS): Heart normal, diffuse opacities.

HRCT is essential for diagnosing and classifying ILD.

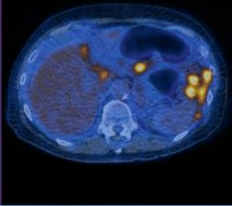
Use the compartment approach to diagnose mediastinal masses.

Andrea Rockall  
Andrew Hatrick  
Peter Armstrong  
Martin Wastie



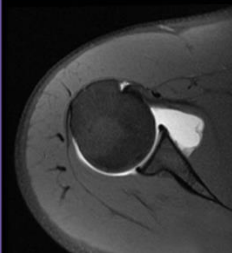
# DIAGNOSTIC IMAGING

SEVENTH EDITION



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