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BASIC CARDIAC RADIOLOGY

Prachi Agarwal, MD

Assistant Professor

Cardiothoracic Radiology

Fall 2008

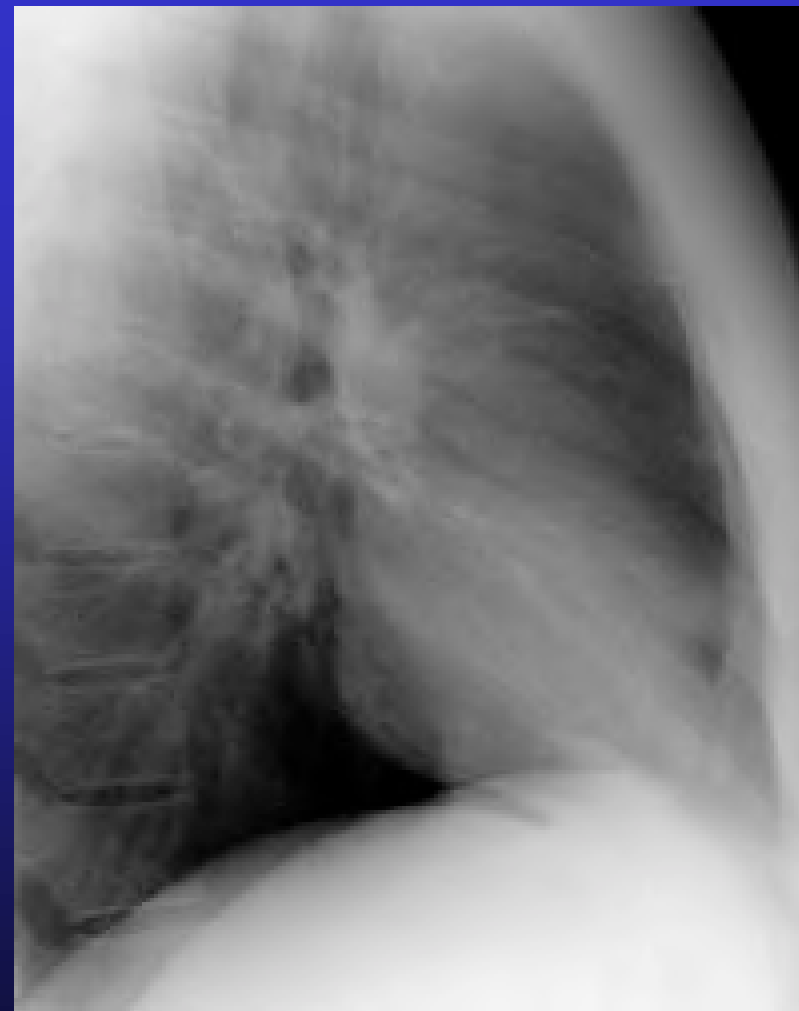


Objectives

- Understand available imaging modalities
- CXR Diagnostic approach
- Unknowns

Imaging modalities

- Radiography
- Echocardiography
- Nuclear Medicine
- Computed tomography
- Magnetic resonance imaging
- Angiography

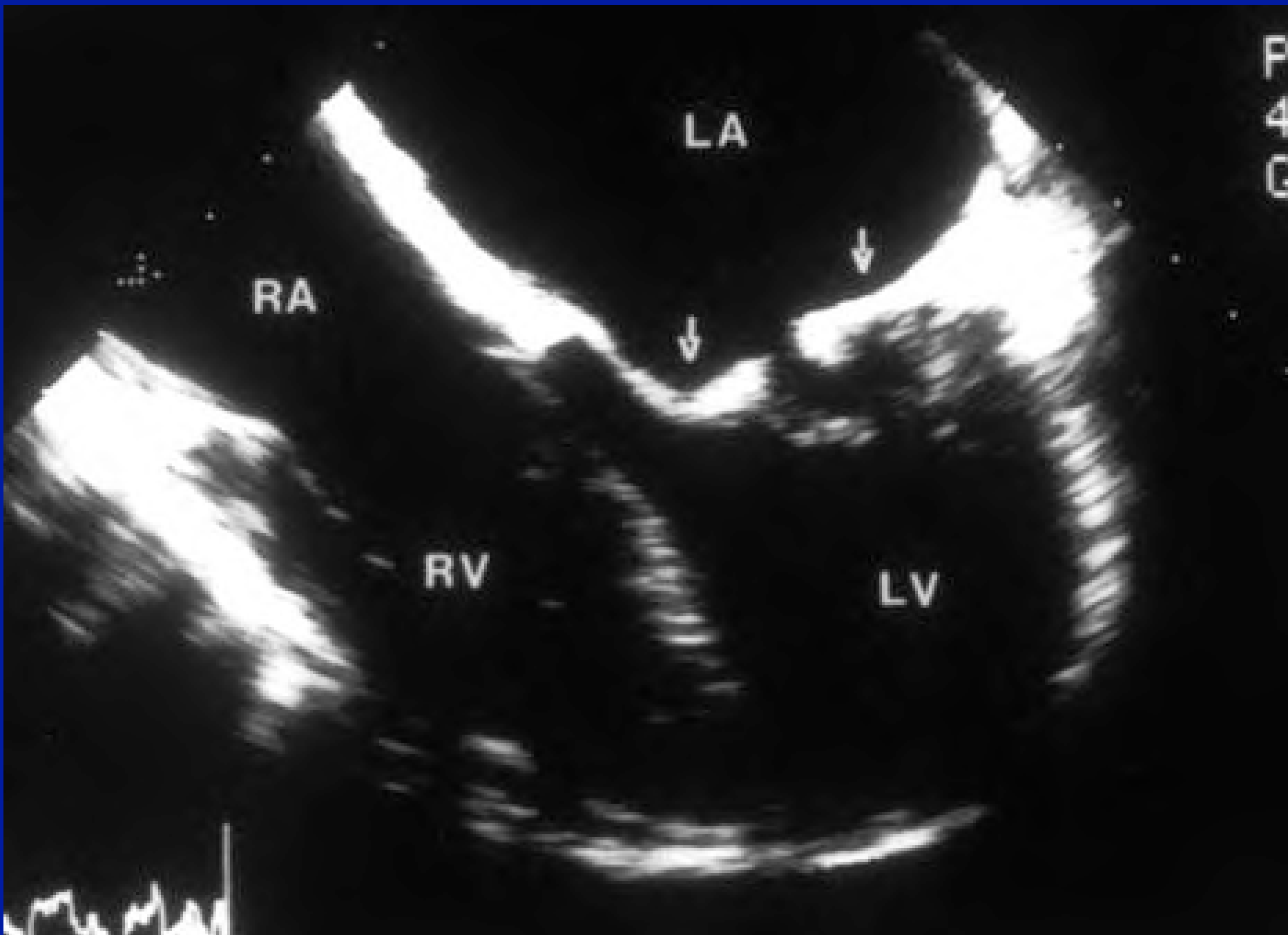


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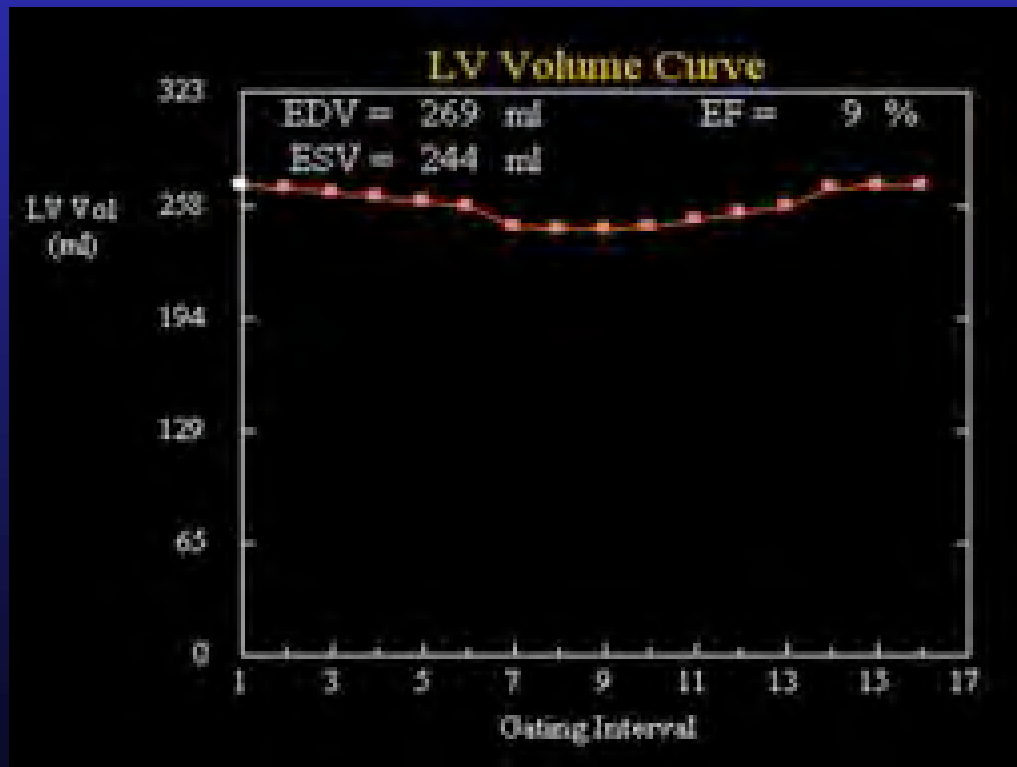




End-diastole

End-systole

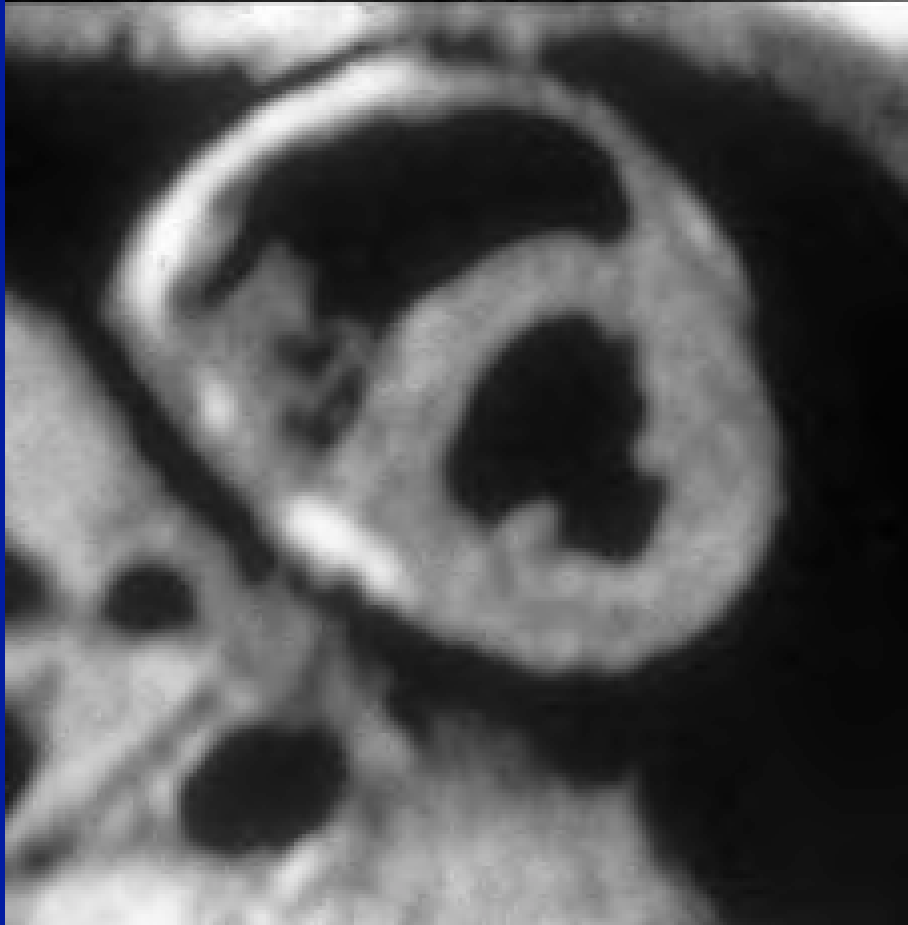
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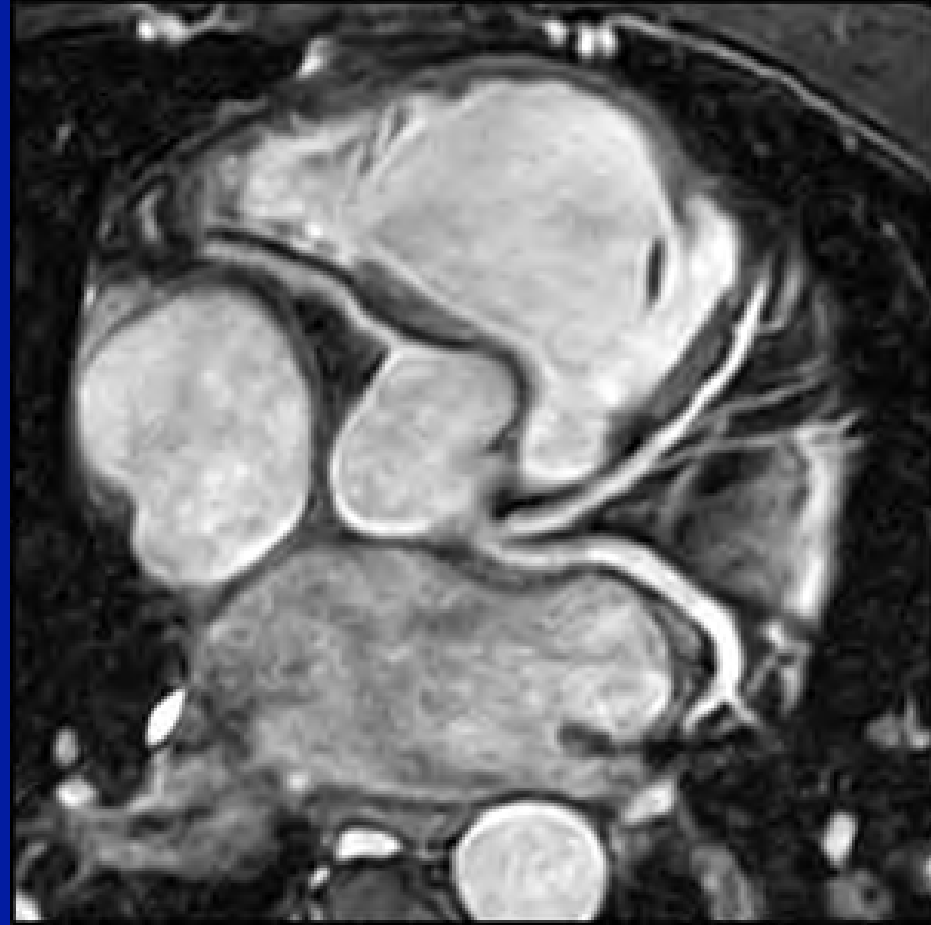
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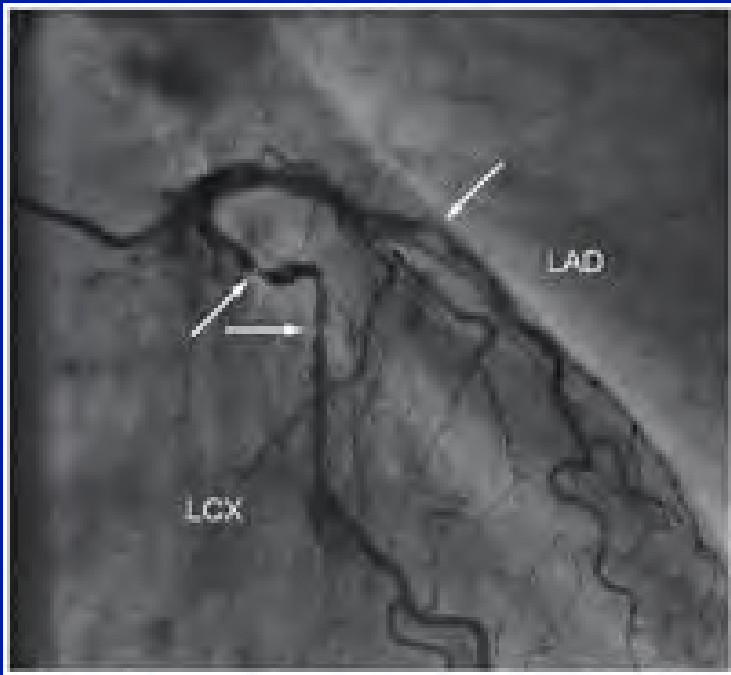




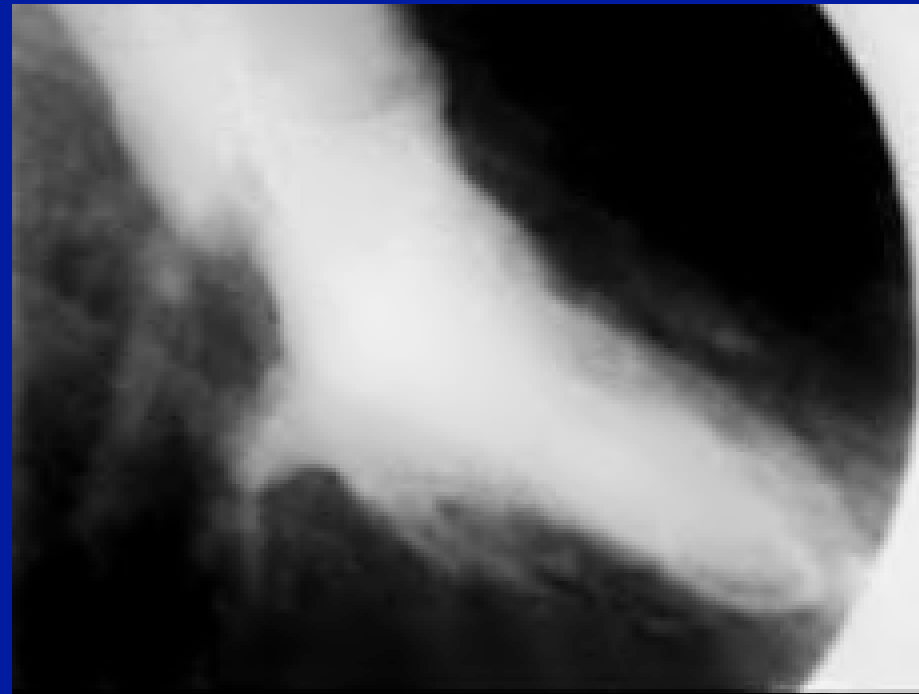
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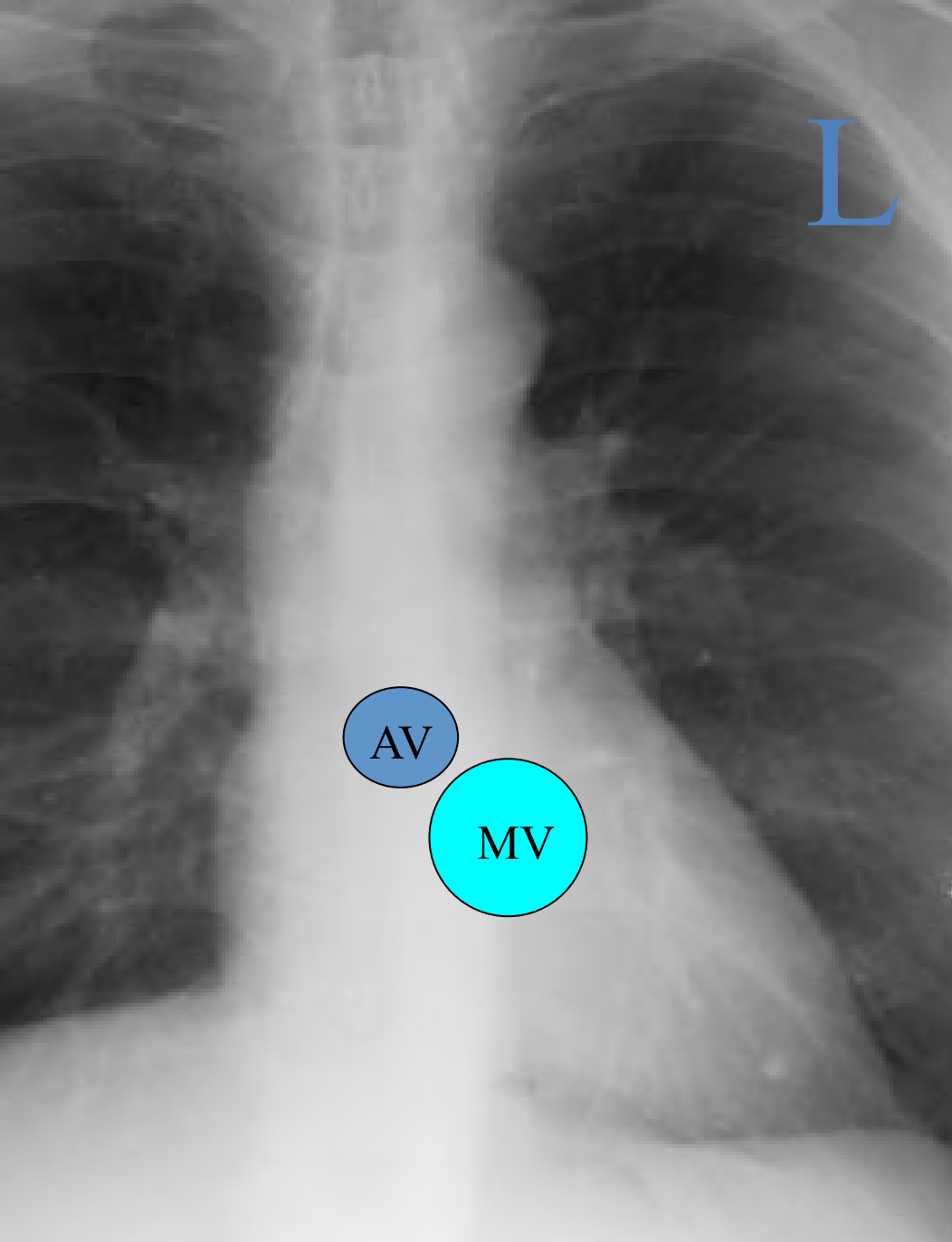
Diagnostic Approach

- **Need to evaluate**

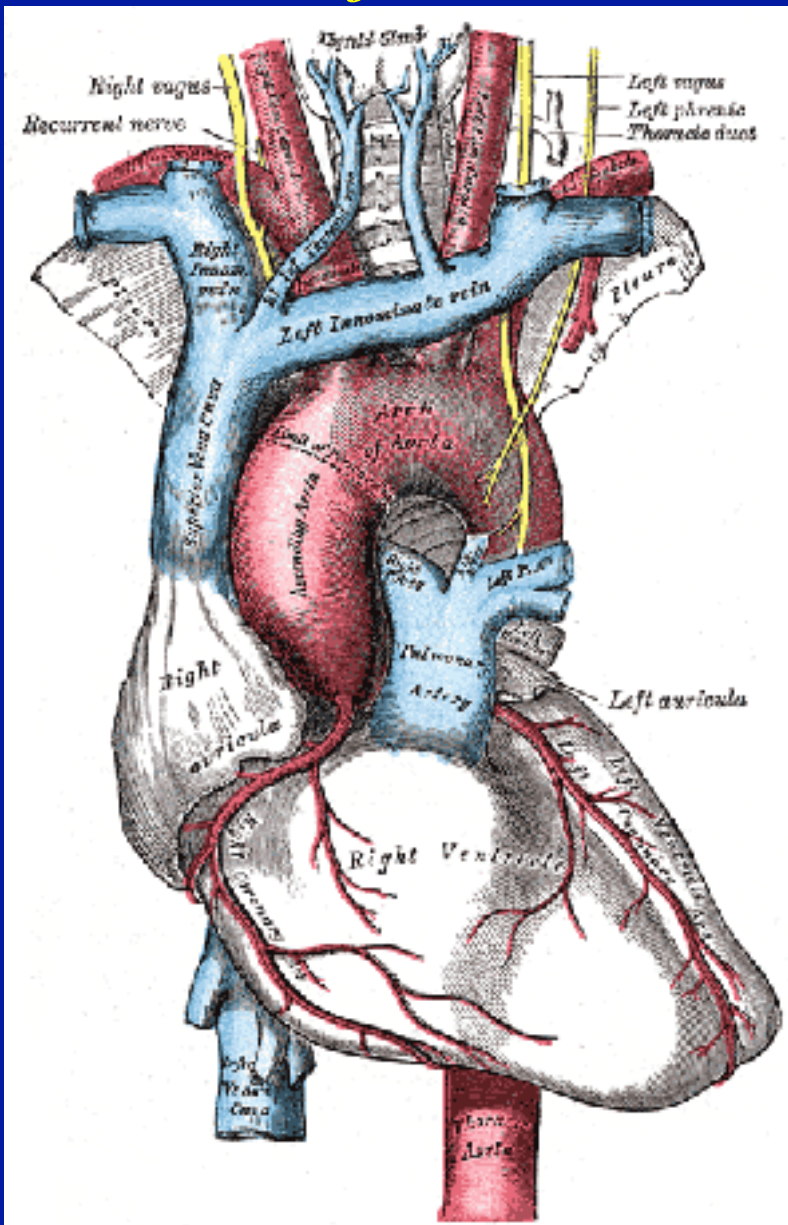
- 1. morphology**

- 2. physiology**

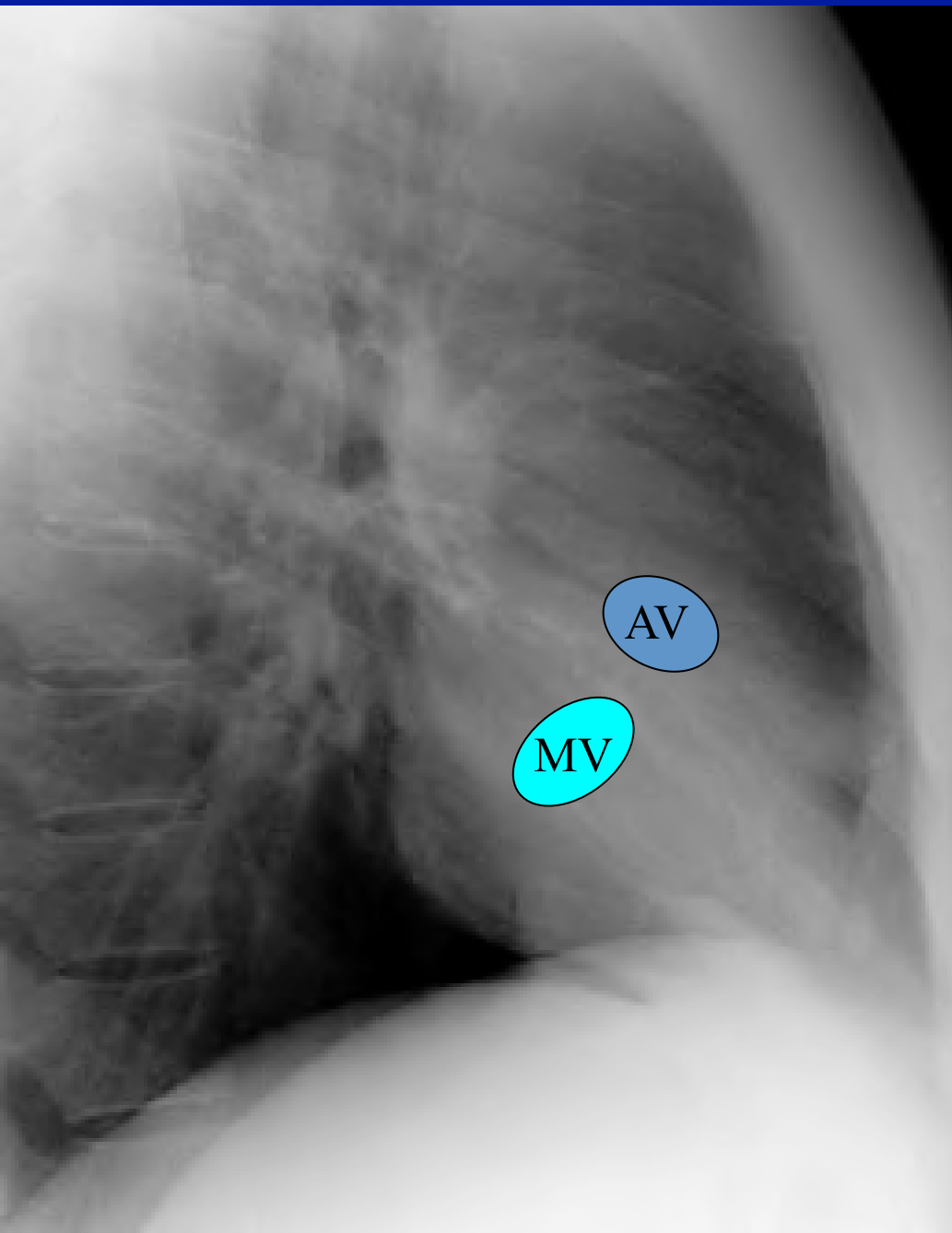
Normal Cardiac Contours



normal frontal view



normal lateral view



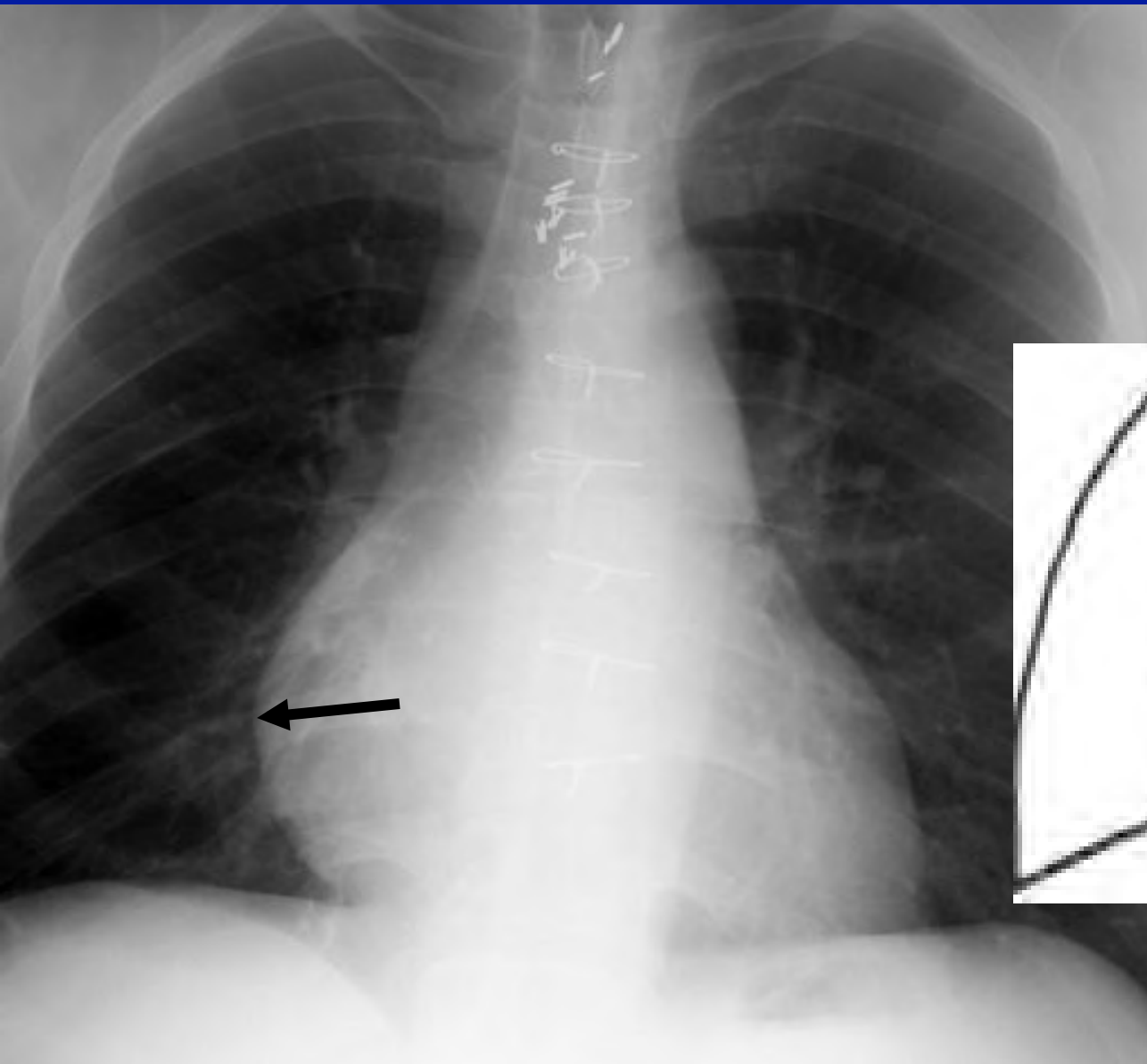
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Patrick Lynch, [wikimedia commons](https://commons.wikimedia.org/wiki/File:Heart_lateral_view.png)

Abnormal Cardiac Contours

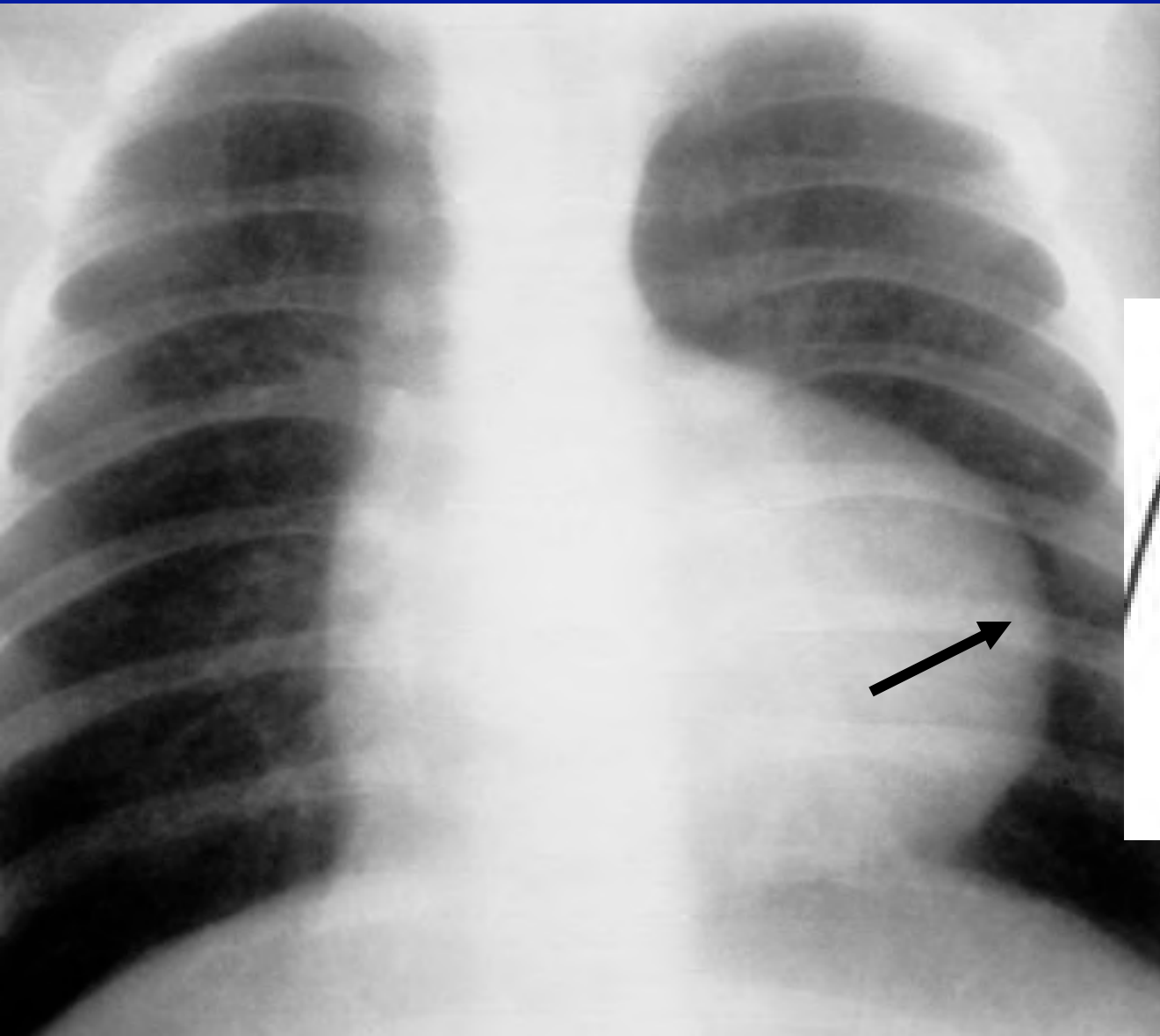
Enlarged Right Atrium



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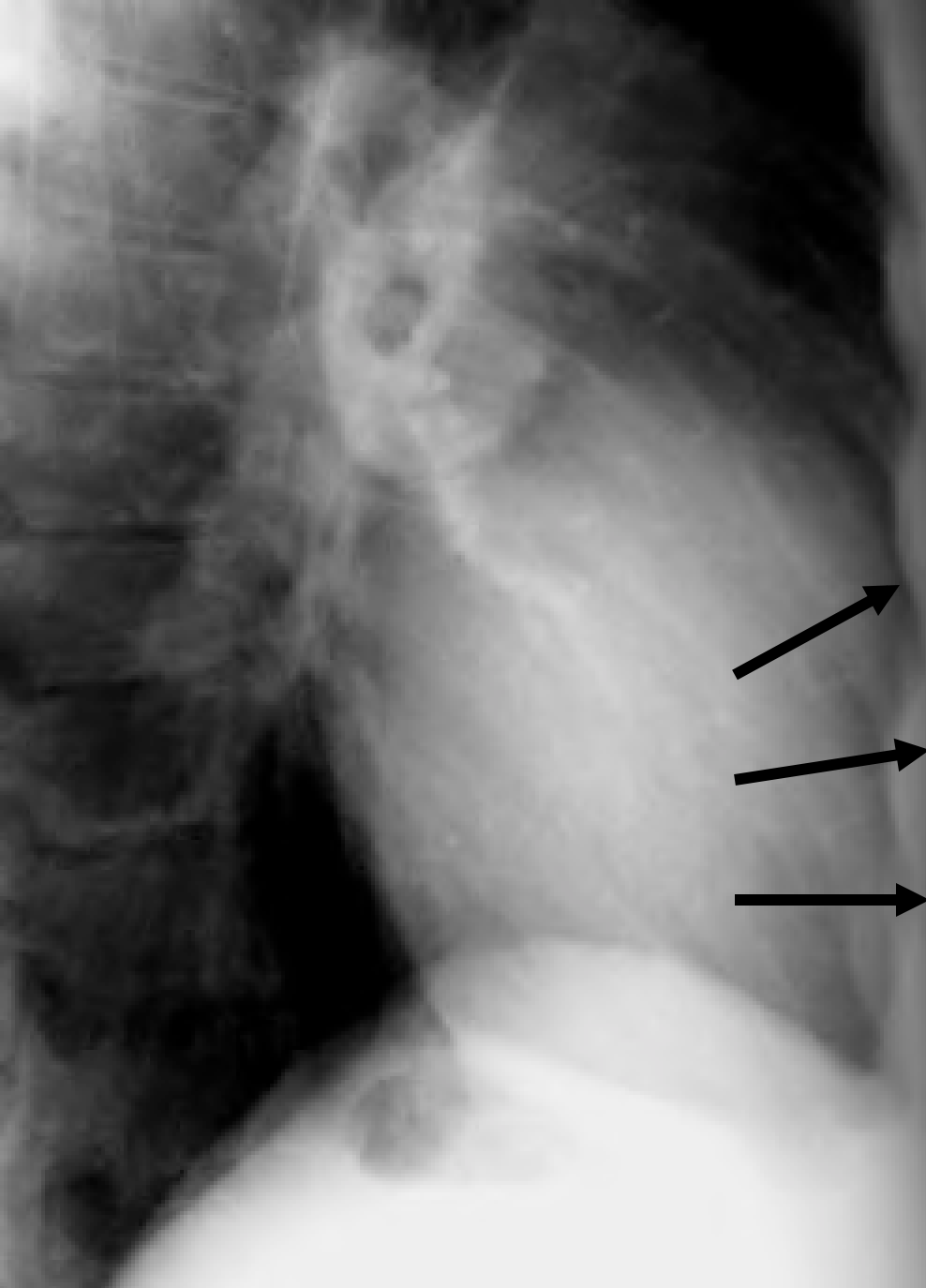
*Enlarged
Right Ventricle*



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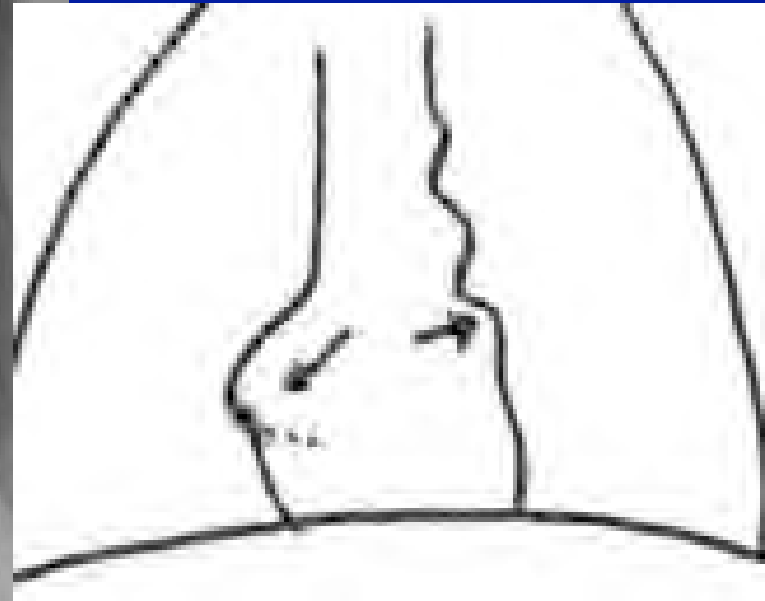
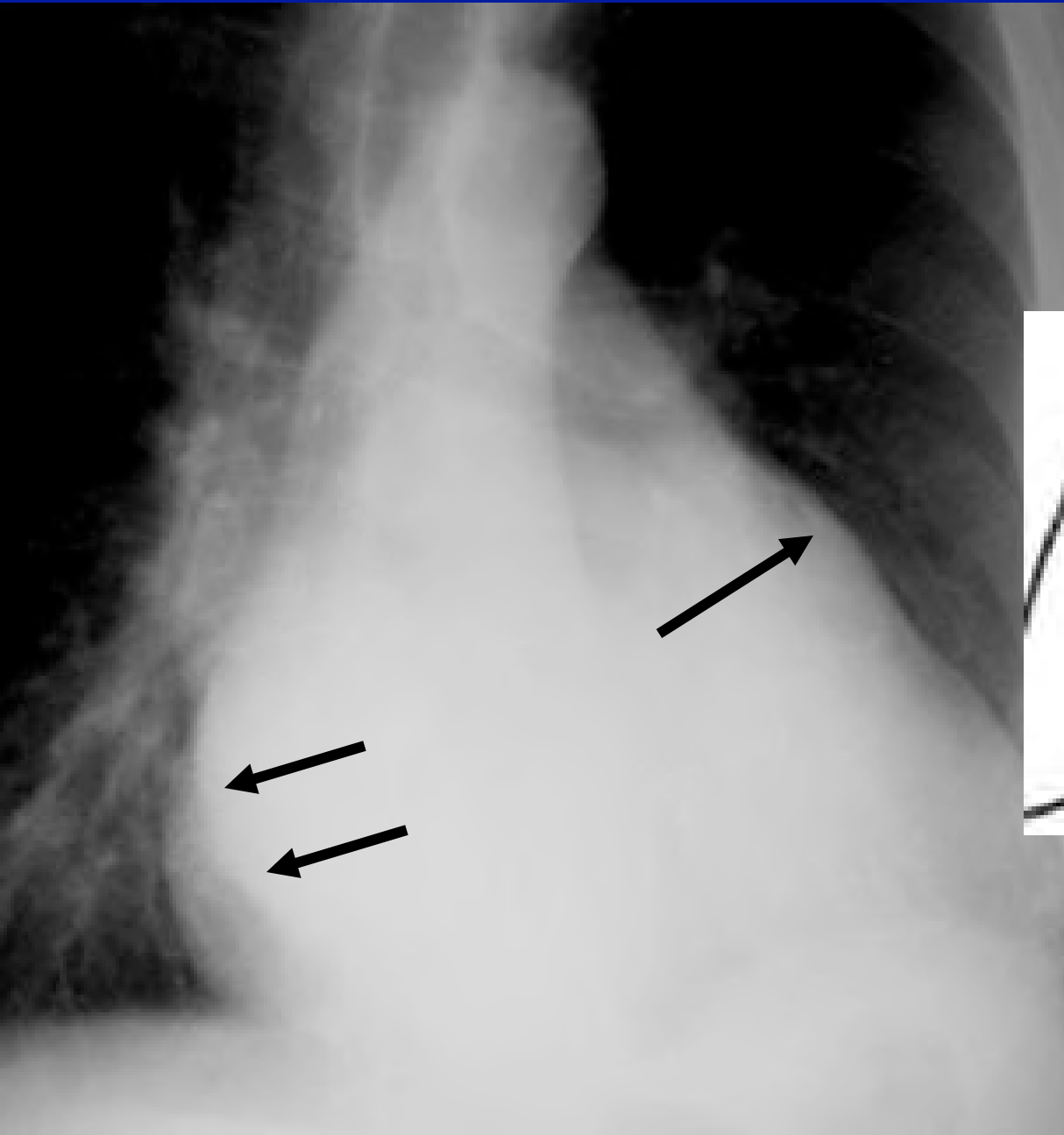
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*Enlarged
Right Ventricle
(lateral CXR)*



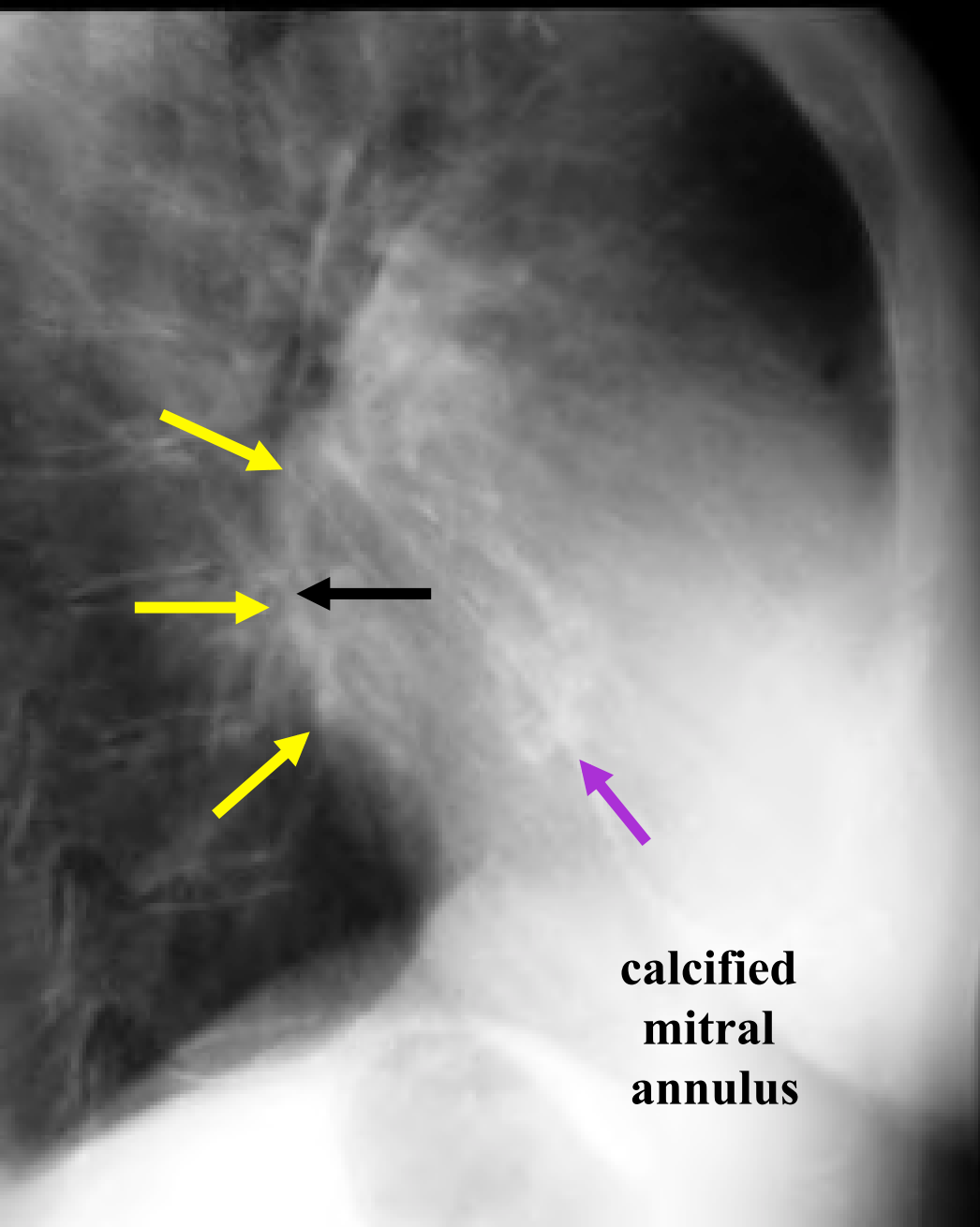
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*Enlarged
Left Atrium*

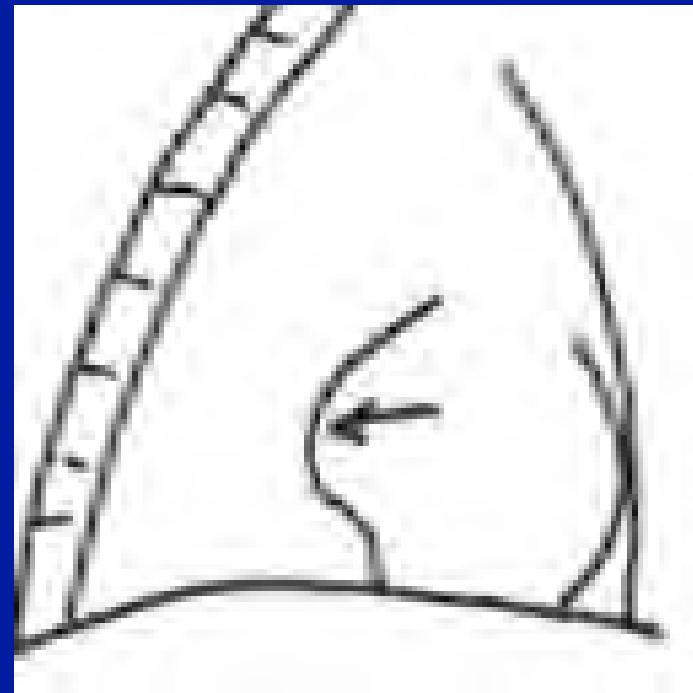


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*Enlarged
Left Atrium*

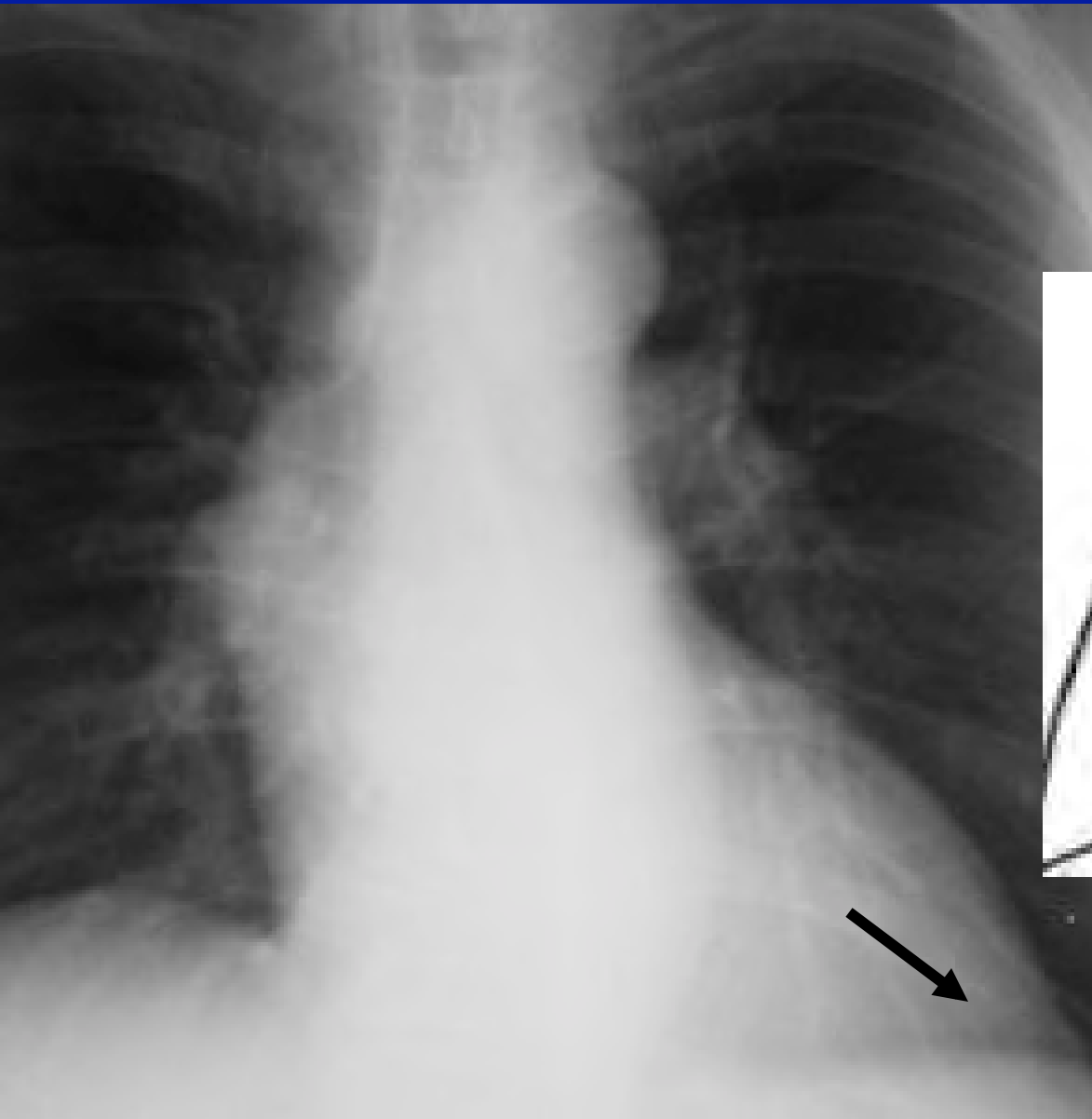


**calcified
mitral
annulus**



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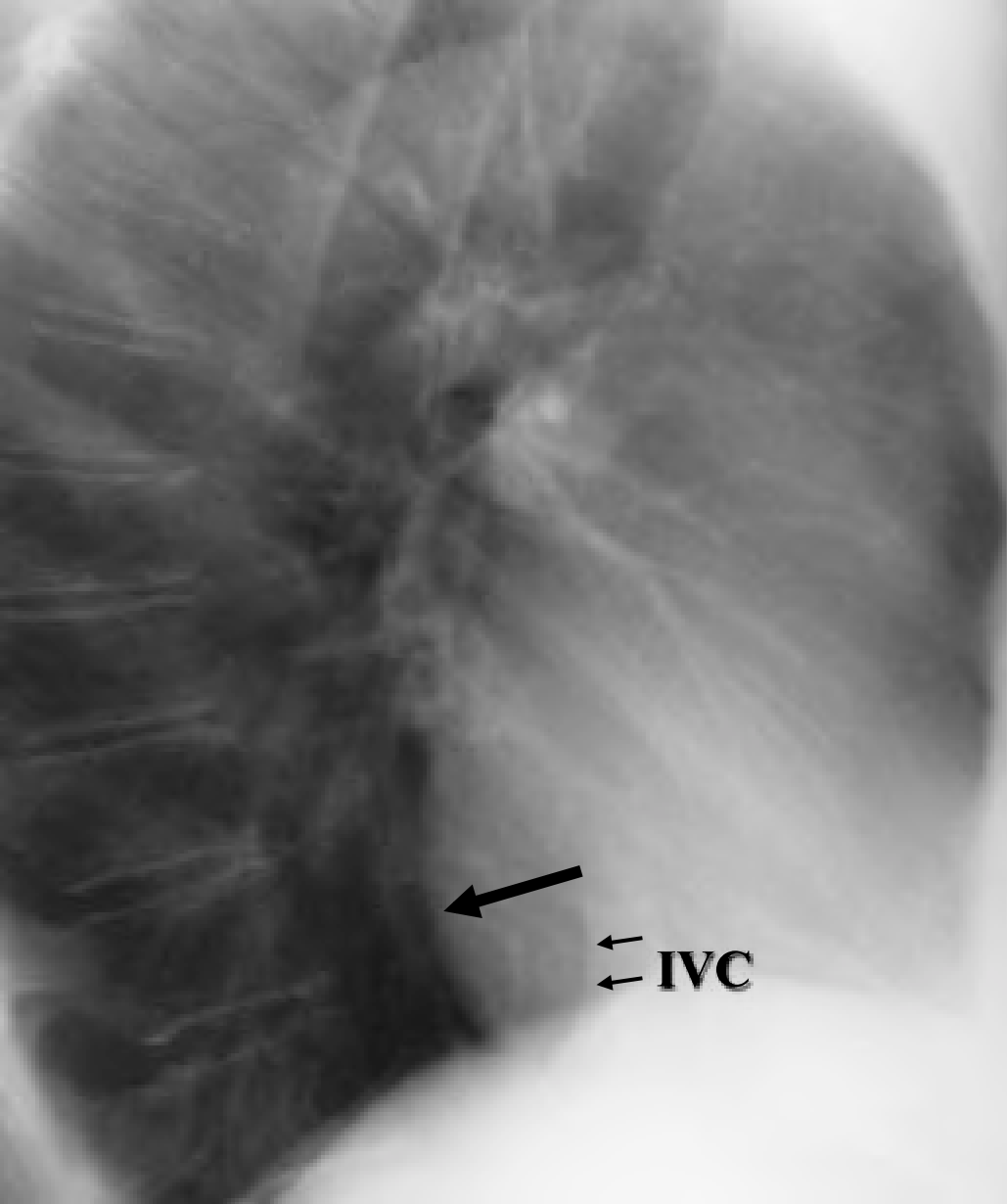
Enlarged Left Ventricle



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Enlarged Left Ventricle



Chest Radiograph

Cardiovascular Physiology

- **Pulmonary Blood Flow**
- **Pulmonary Artery Pressure**
- **Capillary Wedge Pressure**

Pulmonary Blood Flow

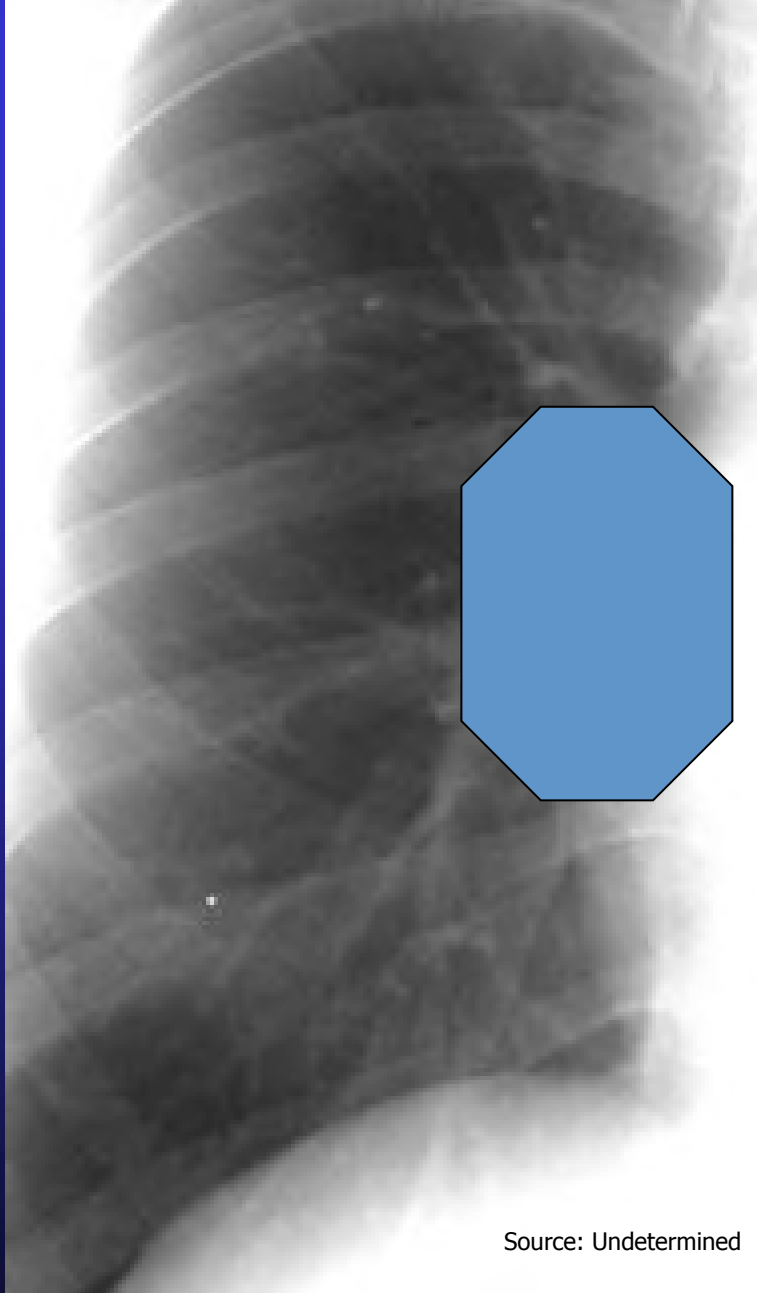


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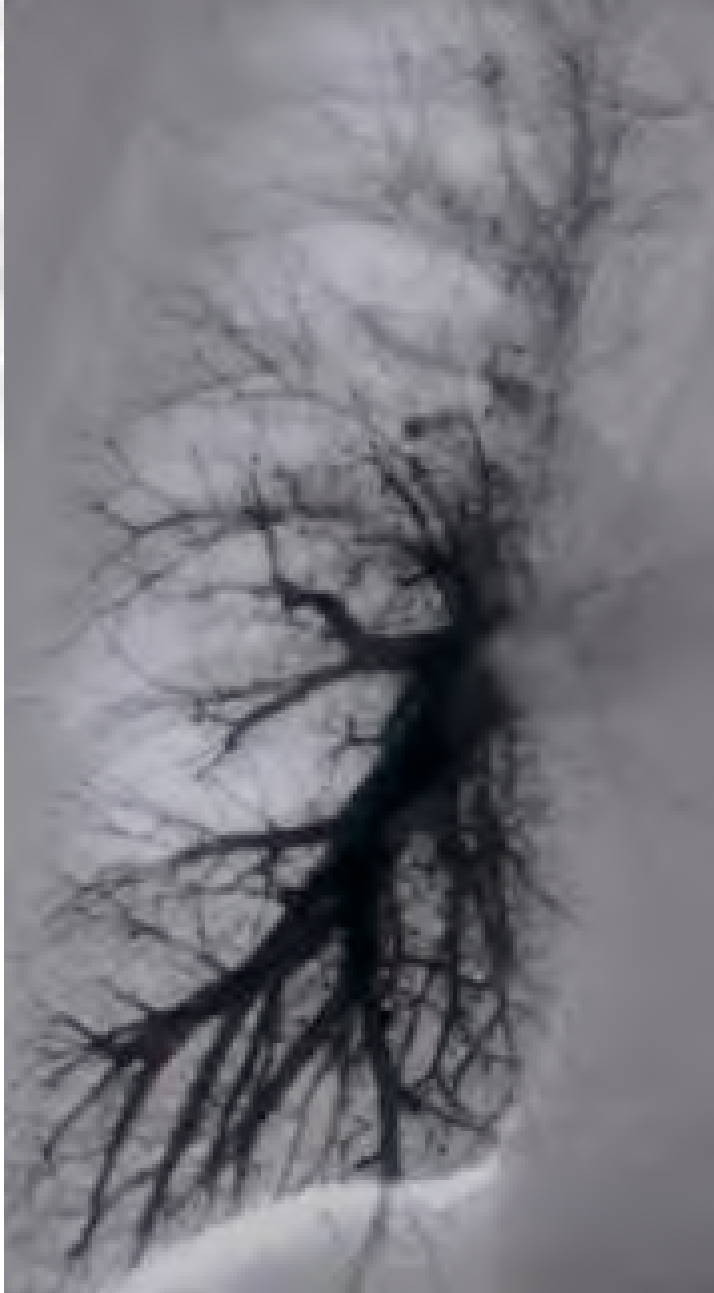
Normal Flow Pattern







Source: Undetermined





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Normal Flow

Increased Flow







PD-INEL Source Undetermined

Normal Flow



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Decreased Flow







PD-INEL Source Undetermined

Normal Flow



PD-INEL Source Undetermined

Pulmonary Hypertension





Lung Water

pulmonary edema

Wedge pressure



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Normal Flow



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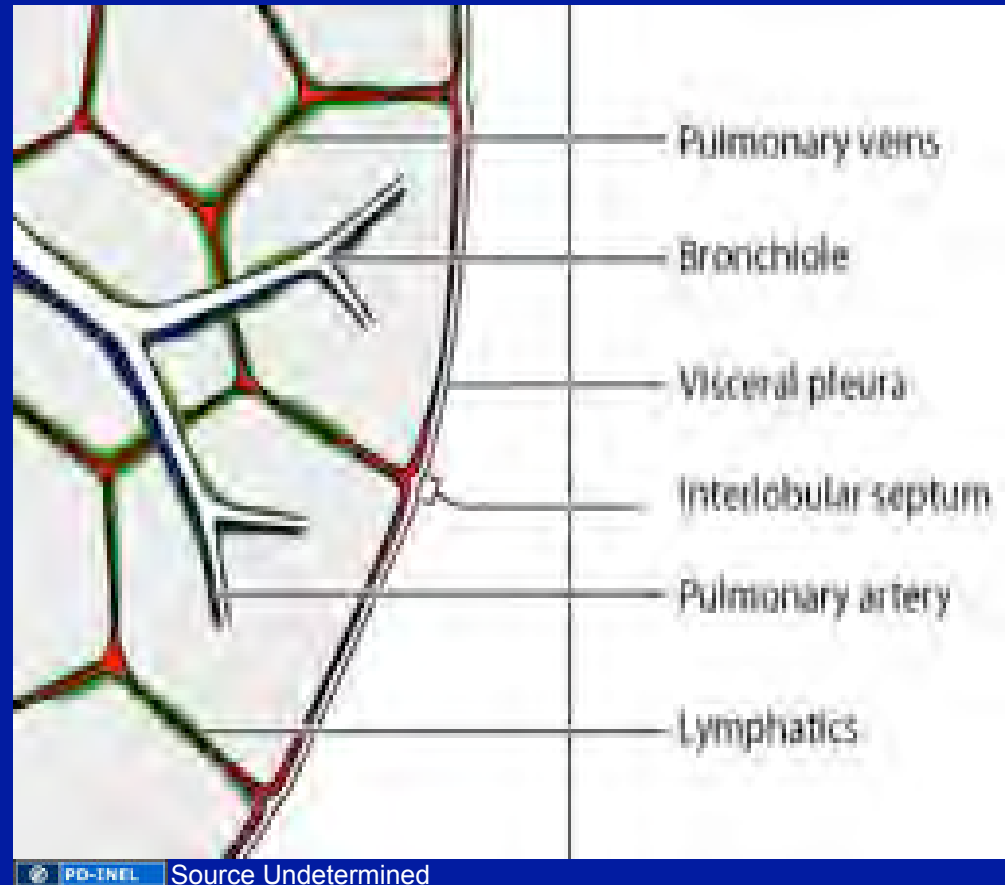


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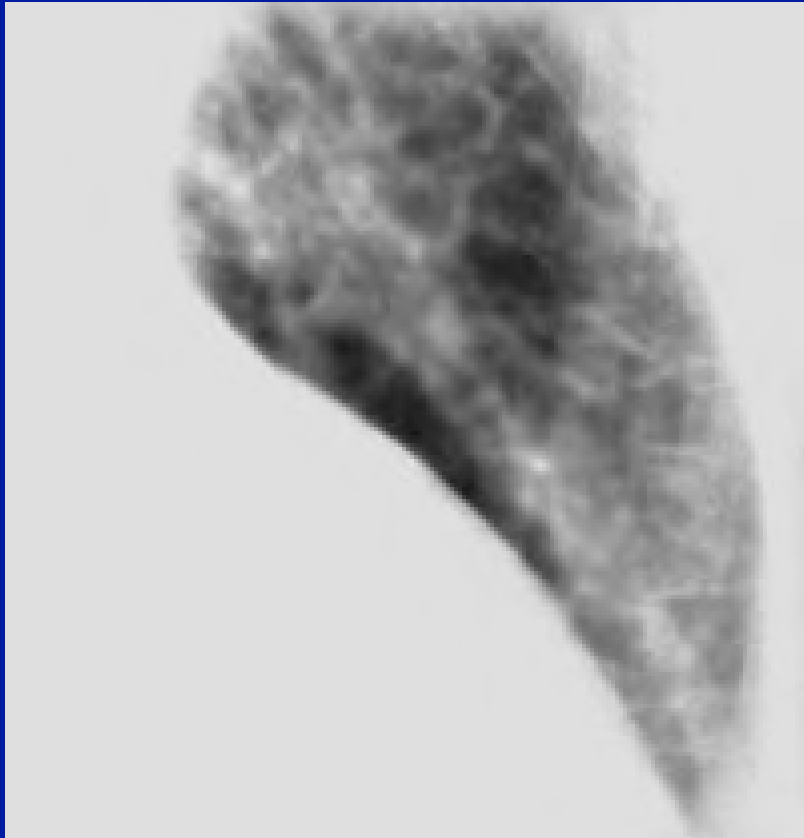


Secondary Pulmonary Lobule

- polyhedral shape
- center:
 - artery, bronchus, lymphatics
- periphery:
 - » veins, lymphatics
- borders:
 - » interlobular septa
 - » 0.1 mm thick, 1-2 cm long
- 1 - 2.5 cm in size
- 3 - 12 acini



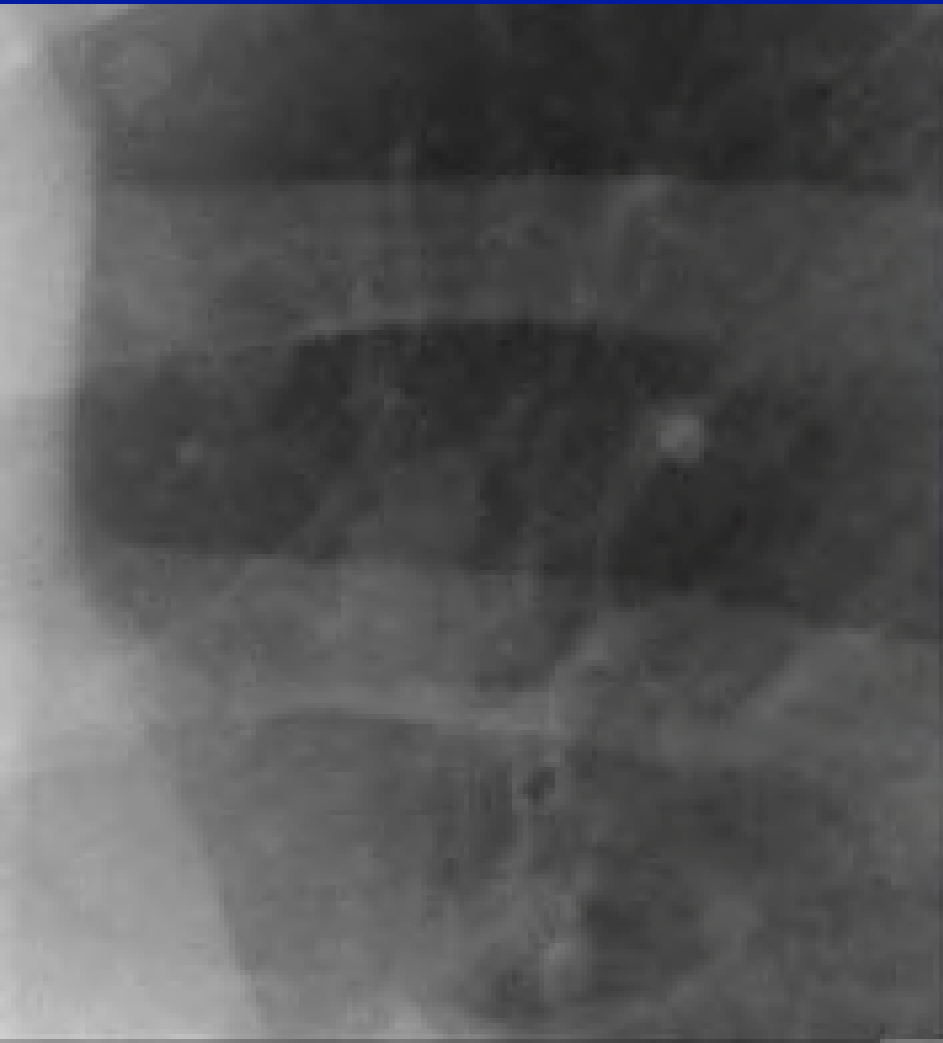
interlobular septa – Kerley B lines on CXR



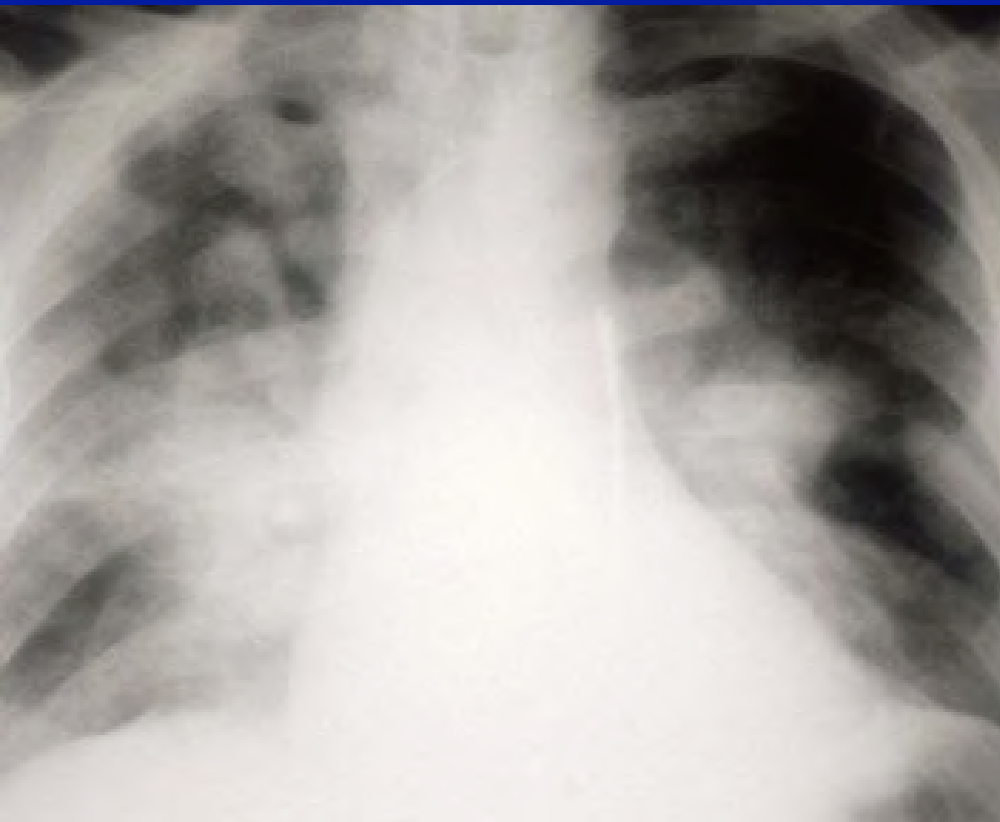
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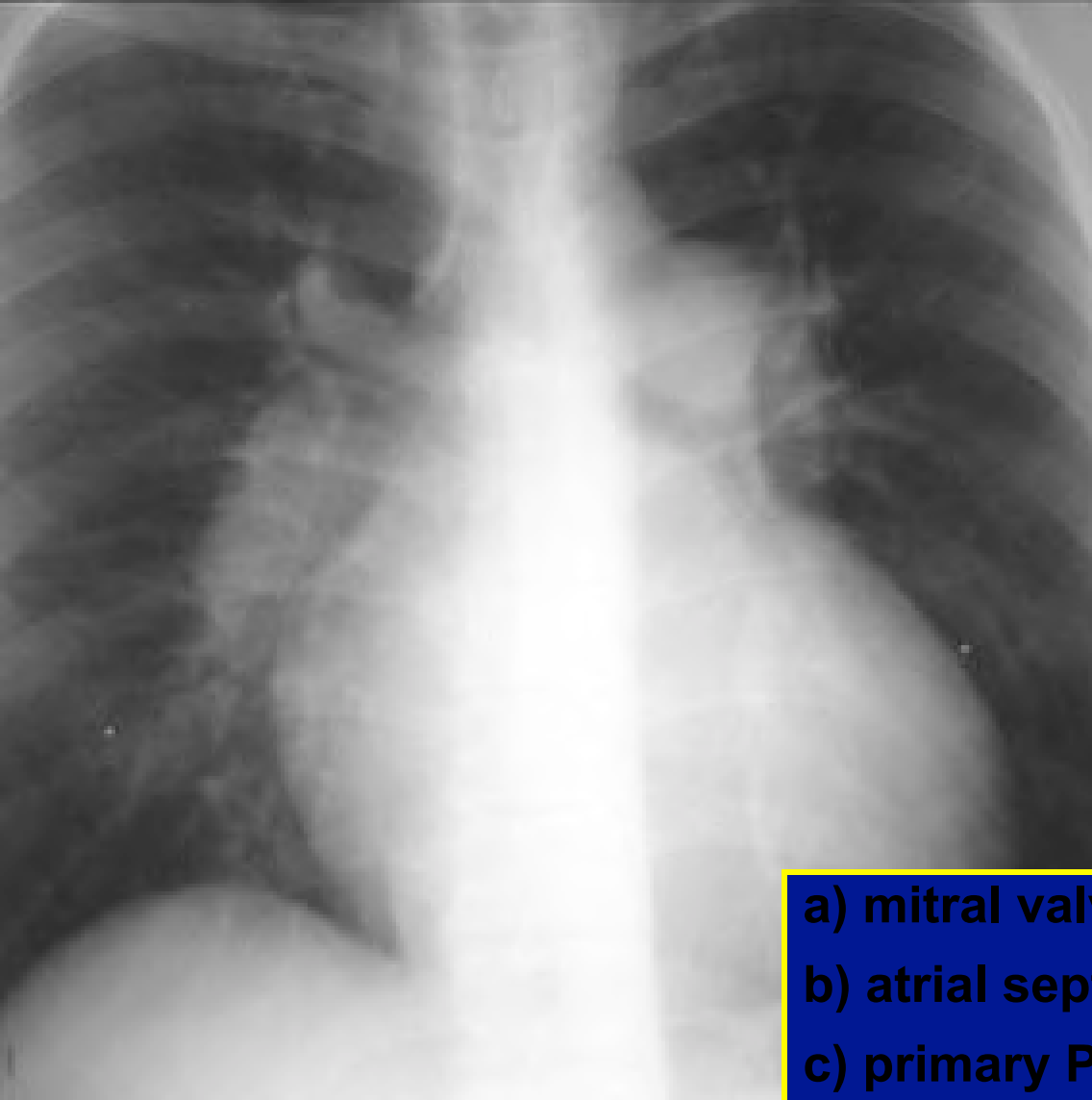


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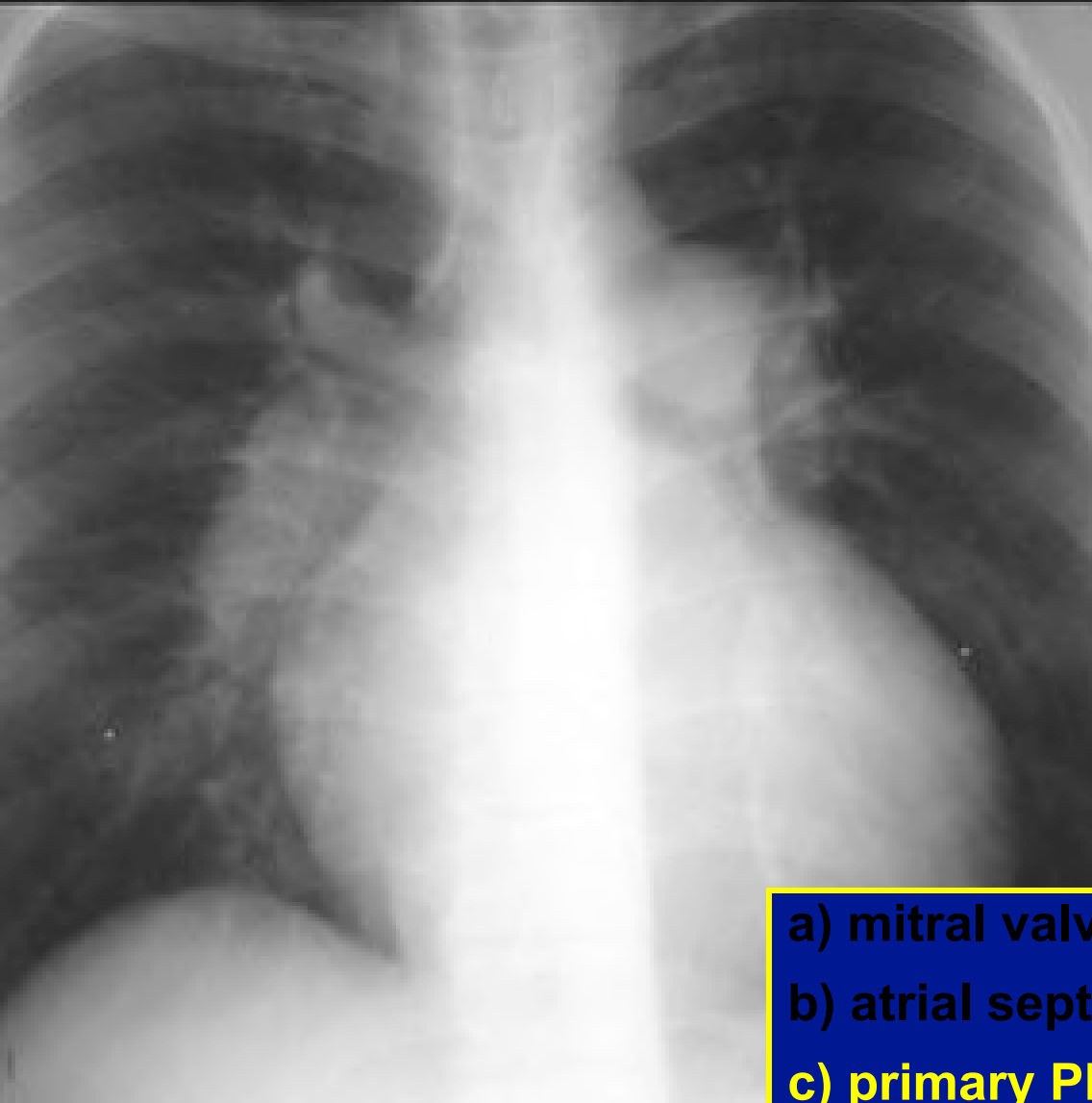


54 year old with dyspnea on exertion



- a) mitral valve disease
- b) atrial septal defect
- c) primary PHTN
- d) pulmonary edema

54 year old with dyspnea on exertion



- a) mitral valve disease
- b) atrial septal defect
- c) primary PHTN**
- d) pulmonary edema



24 year-old with heart murmur

- a) pulmonic stenosis
- b) ASD
- c) fluid overload
- d) primary PHTN



24 year-old with heart murmur

- a) pulmonic stenosis
- b) ASD**
- c) fluid overload
- d) primary PHTN

Objectives

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Special thanks to Philip N. Cascade, M.D.
Cardiothoracic Radiology, University of Michigan

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