

# **Radiological Anatomy Of The Chest**



# Objectives

**By the end of the lecture you should be able to:**

- 1- Identify the bones of the thoracic cage.
- 2- Identify superficial soft tissues.
- 3- Identify the trachea and lunge fields.
- 4- Describe the mediastinum and the cardiac shadows.
- 5- Describe brief knowledge about **Bronchography**.
- 6- Describe brief knowledge about **Coronary Angiography**

# Radiography

• Different views of the chest can be obtained by changing the orientation of the body and the direction of the x-ray beams.

• **The most common views are:**

- Posteroanterior (**PA**).
- Anteroposterior (**AP**).
- Lateral.



# Radiography

A chest x-ray may be used to **diagnose, plan treatment and follow up** for various conditions, including:

- Fractures of the chest bones**, including **ribs, sternum, clavicle, vertebrae, and scapula**.
- Lung disorders** such as **pneumonia, emphysema, pleural effusion, tuberculosis and lung cancer**.
- Heart disorders** such as congestive heart failure ,which causes heart enlargement (**cardiomegaly**).
- Chest radiographs** are also used to screen for **job-related lung diseases** in industries such as mining where workers are exposed to dust, (e.g. asbestosis, silicosis).
- Chest x-ray** is also requested as **pre-employment** demand.

# Posteroanterior View



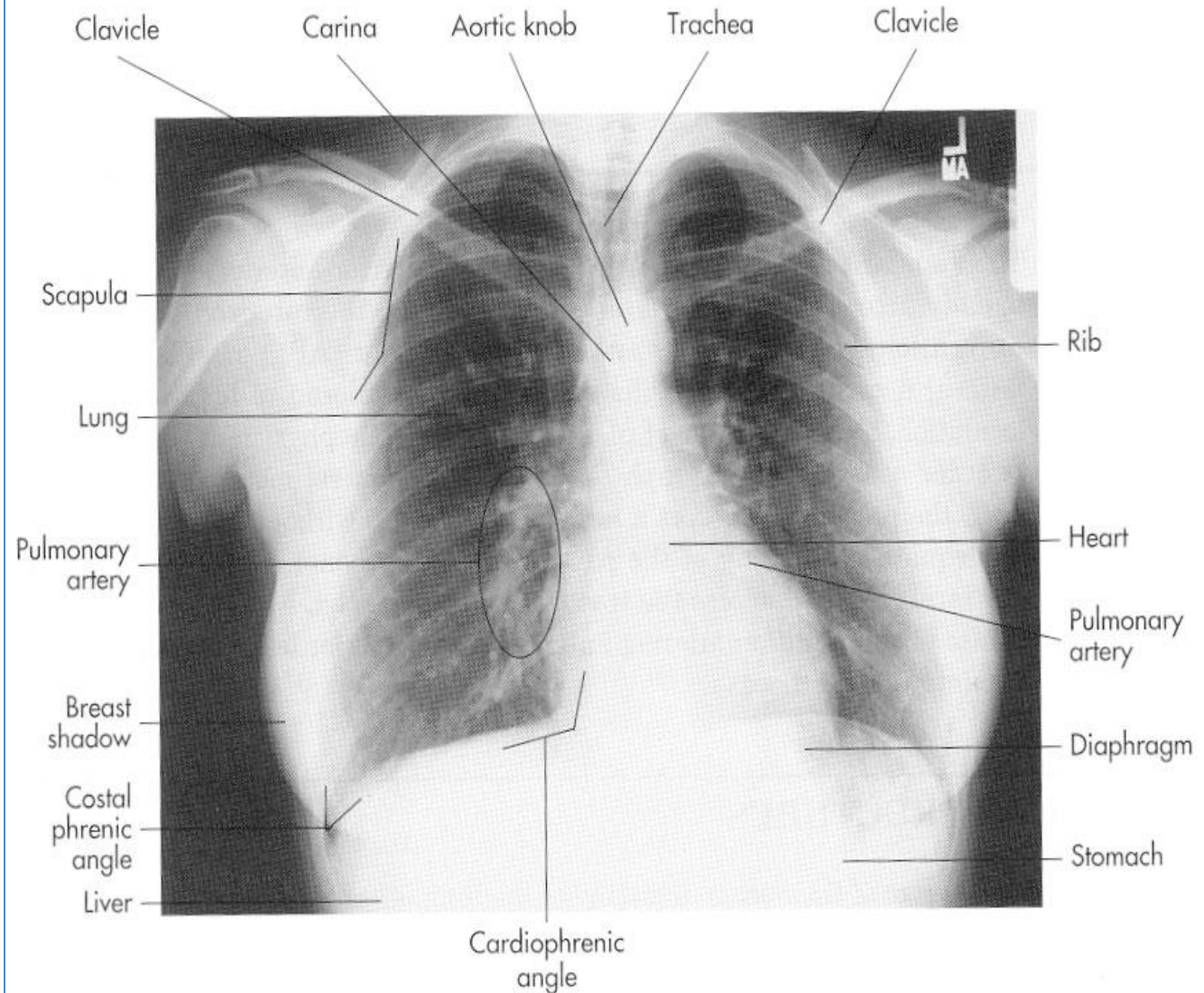
# Posteroanterior

❑ For **Posteroanterior** view (**PA**), the following systems must be examined in order.

➤ Superficial soft tissues;

➤ Nipples in both sexes.

➤ Breast shadow in female are seen superimposed on the lung fields.

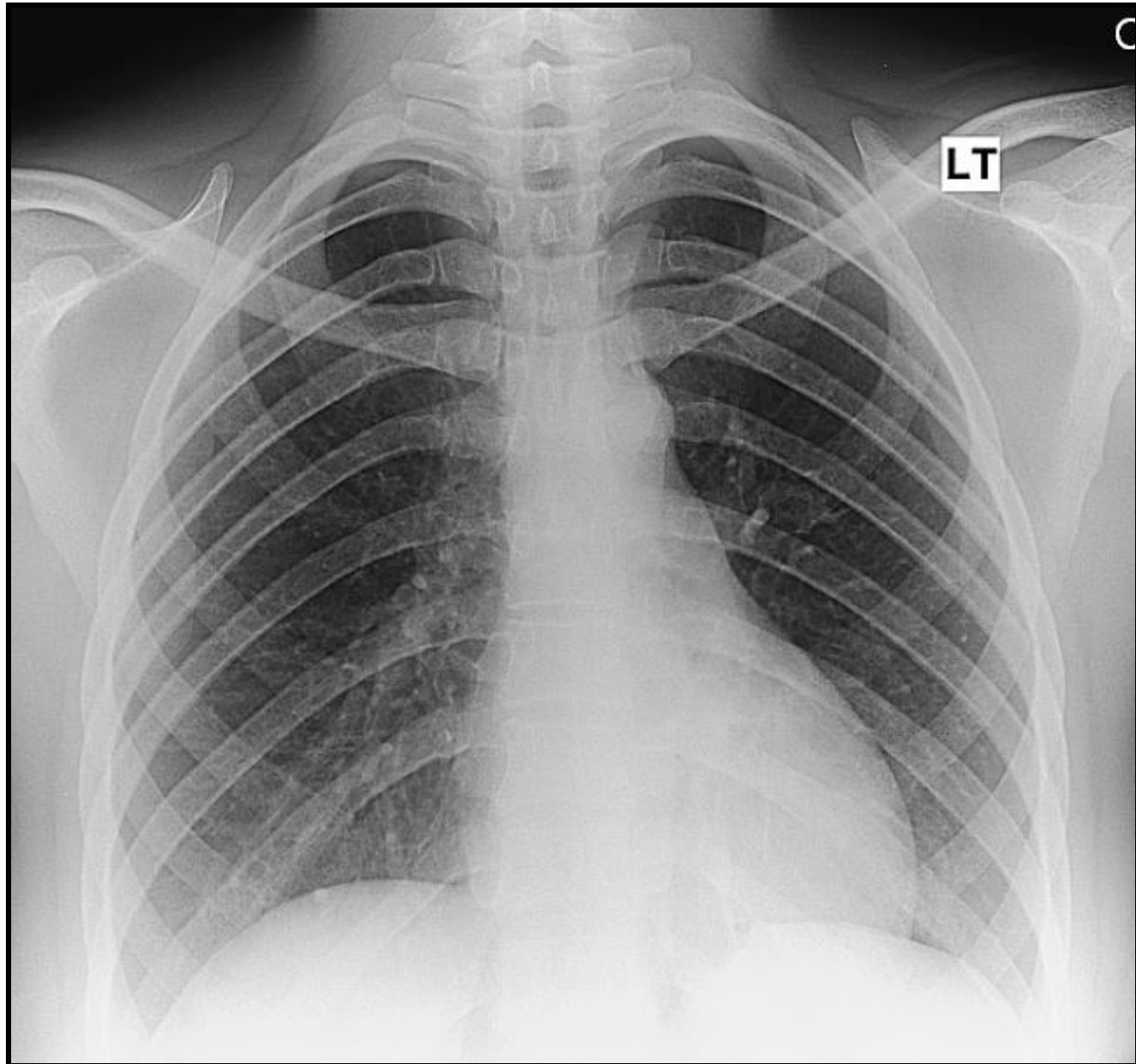


**Fig. 3-1** Normal position of anatomical structures on a posterior or anterior chest radiograph.

## Posteroanterior view (Bones)

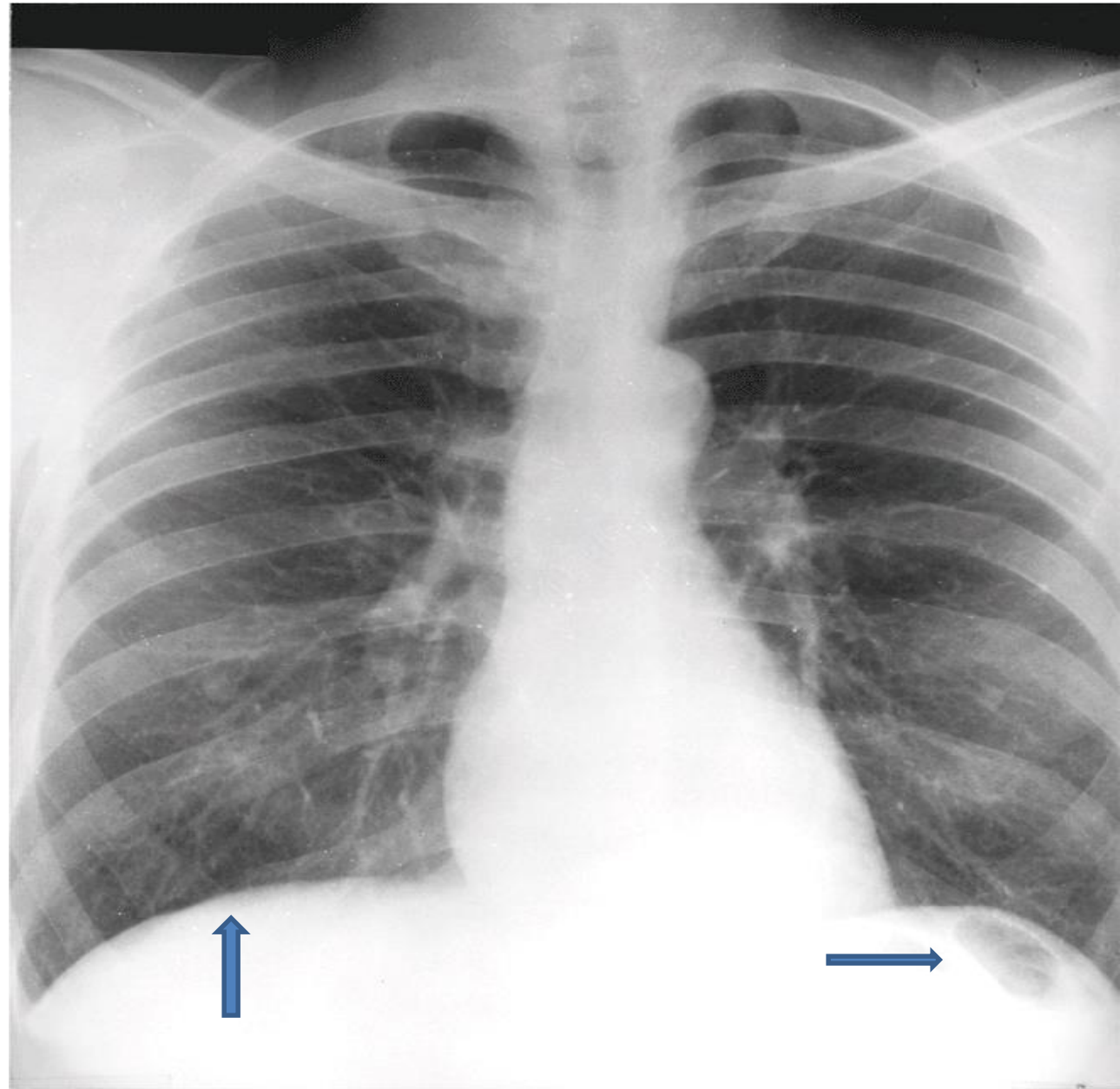
### Bones of the thoracic cage, e.g.

- Anterior ribs,
- Posterior ribs.
- Thoracic vertebrae.
- Cost-transverse  
joints.
- Clavicles.
- Medial border of the  
scapula.



## Posteroanterior view (Diaphragm)

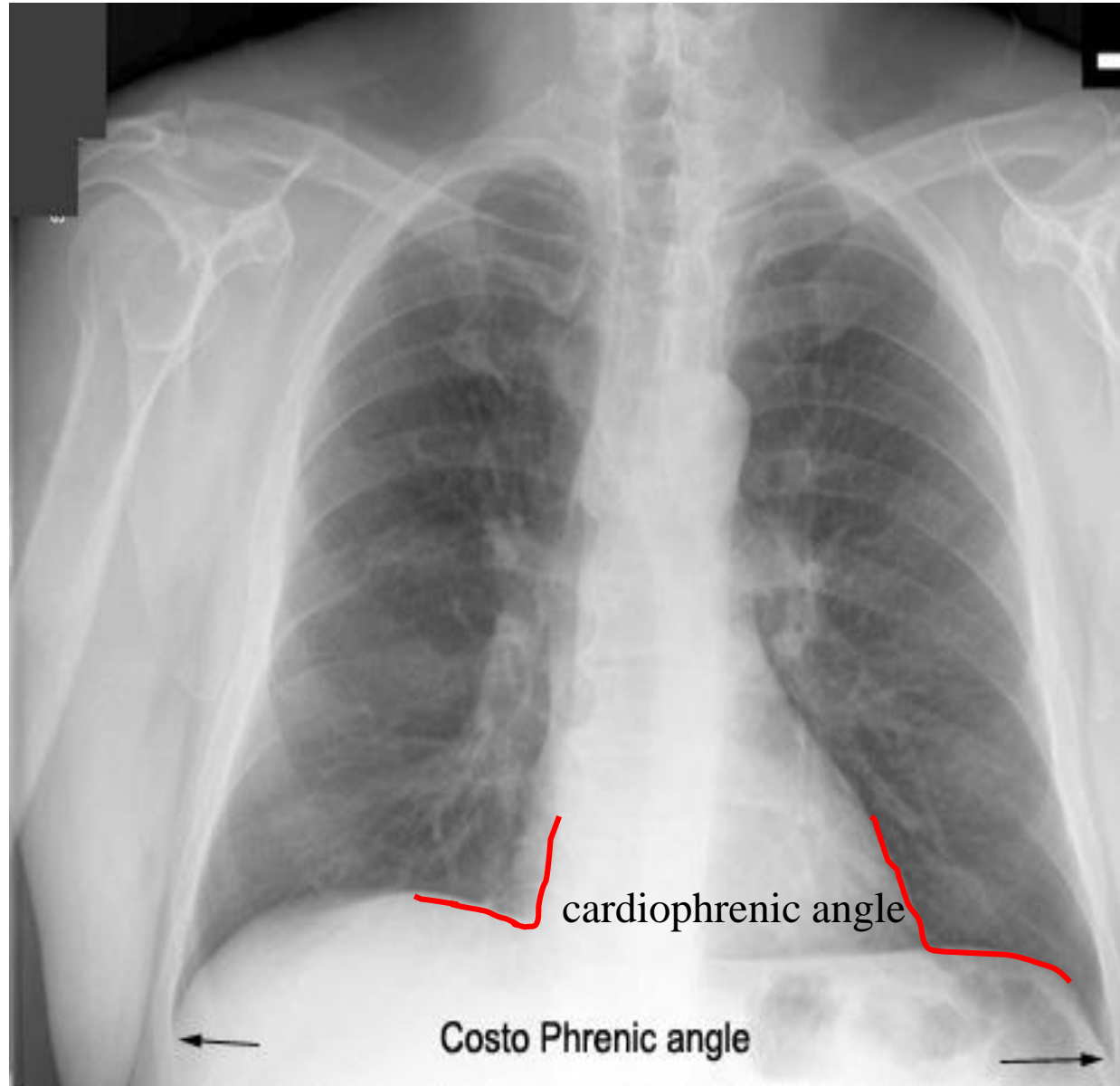
- **The diaphragm** appears as a dome-shaped shadow on each side.
- The right side is slightly higher than the left.
- Beneath the right dome is the homogeneous, dense shadow of the **liver**.
- Beneath the left dome a **gas bubble** mostly seen in the fundus of the stomach.





## Posteroanterior radiograph view (Diaphragm)

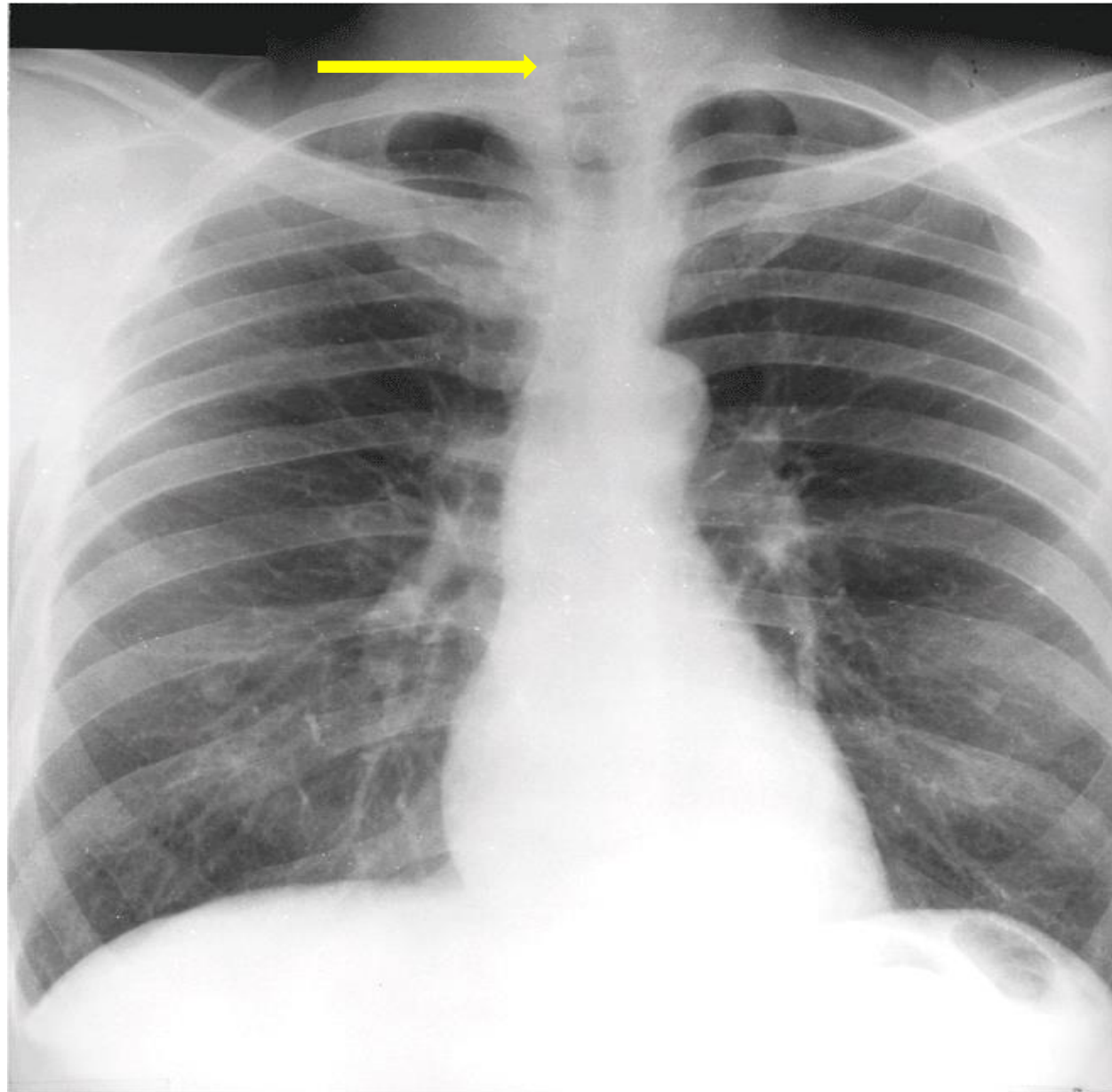
- Notice the **costo-phrenic** angle, where the diaphragm meets the thoracic wall.
- The angle becomes blunt or obscured due to minimal **pleural fluid (effusion)** or fibrosis.
- Also note the **cardiophrenic** angle where the diaphragm meet the heart.



**Posteroanterior  
view  
(Trachea)**

➤ The radio-translucent, air-filled shadow of the **trachea** is seen in the midline of the neck as a dark area.

➤ This is superimposed by the lower cervical and upper thoracic vertebrae.



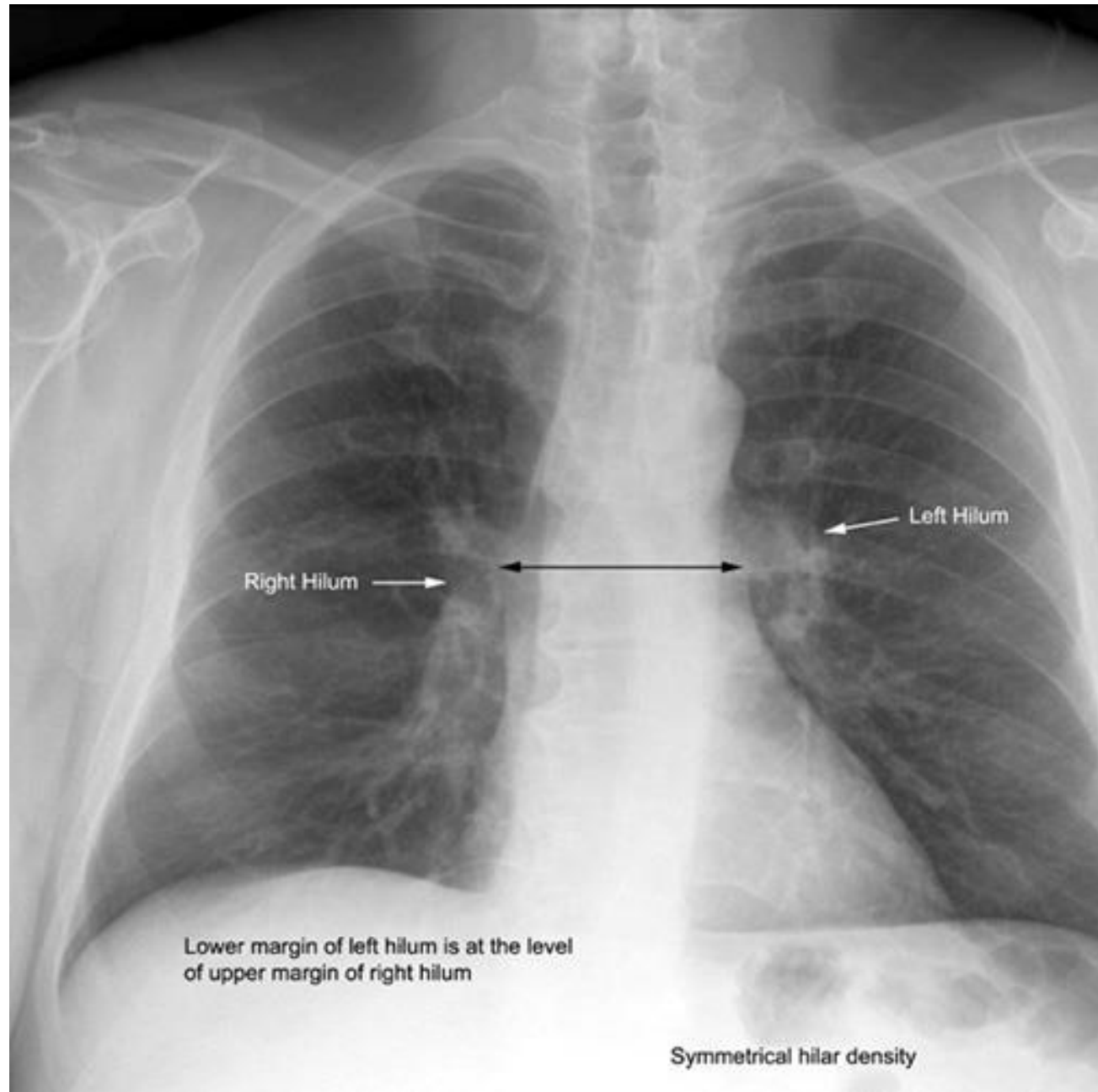
# Posteroanterior view (Lungs)

## ➤ Lung roots:

relatively **dense** shadows caused by the presence of:

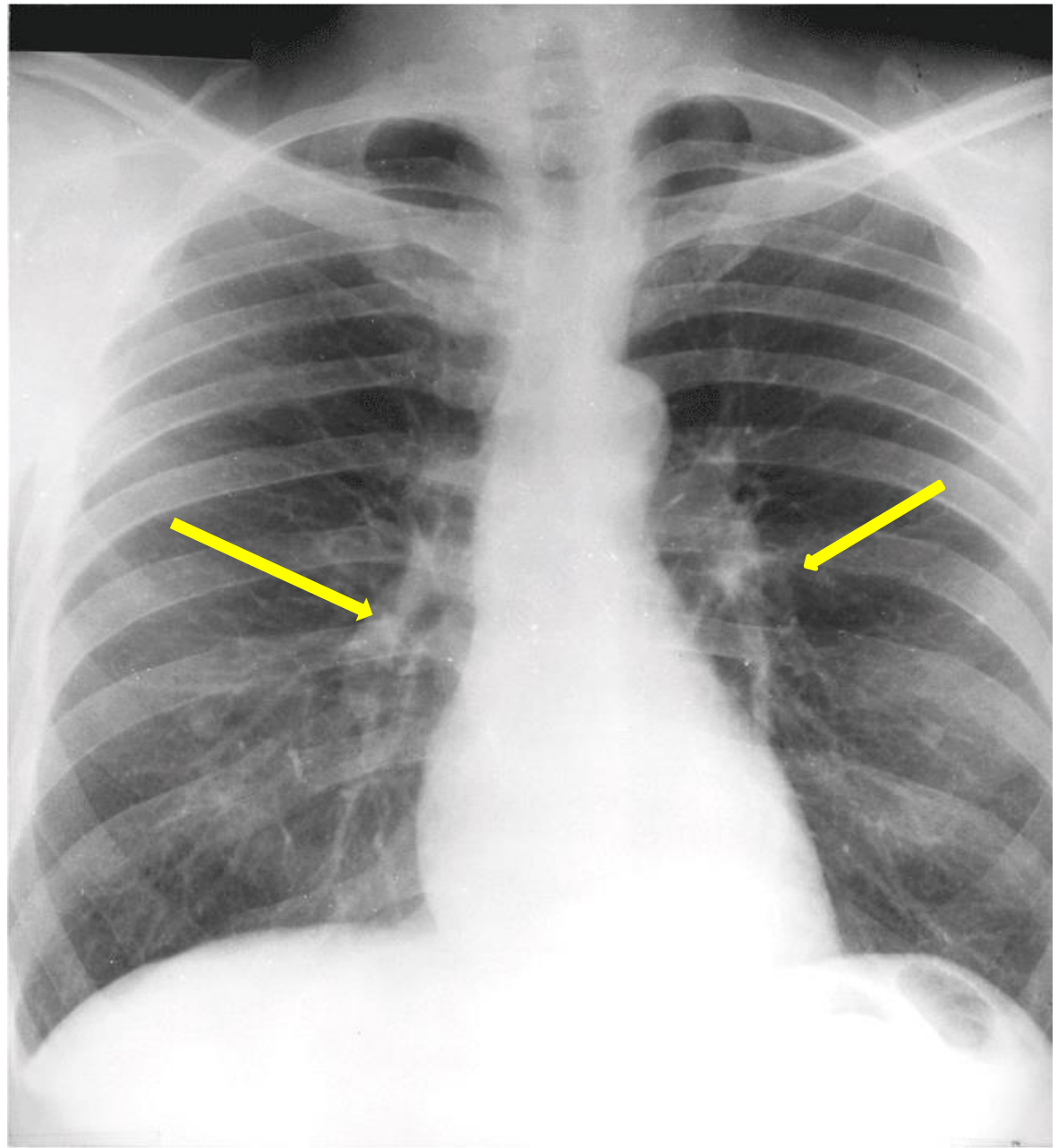
1. Blood-filled pulmonary and bronchial vessels.
2. Large bronchi.
3. Lymph nodes.

➤ Notice that the lower margin of left hilum lies at the level of the upper margin of right hilum.



## Posteroanterior view (Lungs)

- The lung fields, by the air so they are more translucent on full inspiration than on expiration.
- The pulmonary blood vessels are seen as a series of small, rounded, white shadows radiating from the lung root.
- The large bronchi, are seen as similar round shadows.
- The smaller bronchi are not seen.



# Mediastinum and Cardiac Shadow

## Right border

Rt. Brachiocephalic vein.

Superior vena cava.

Rt. atrium.

Inferior vena cava.

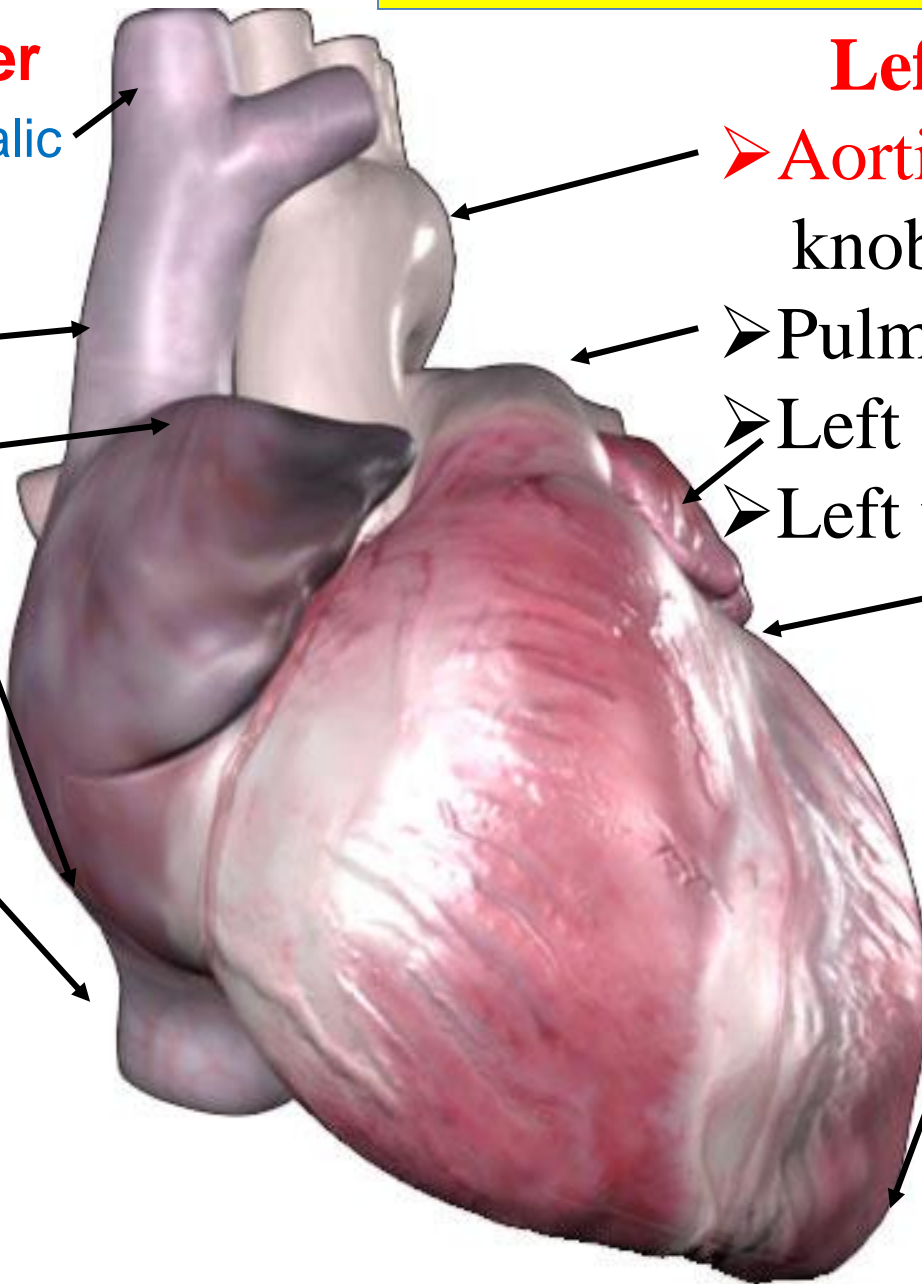
## Left border

➤ Aortic knuckle, or knob (aortic arch).

➤ Pulmonary trunk.

➤ Left auricle.

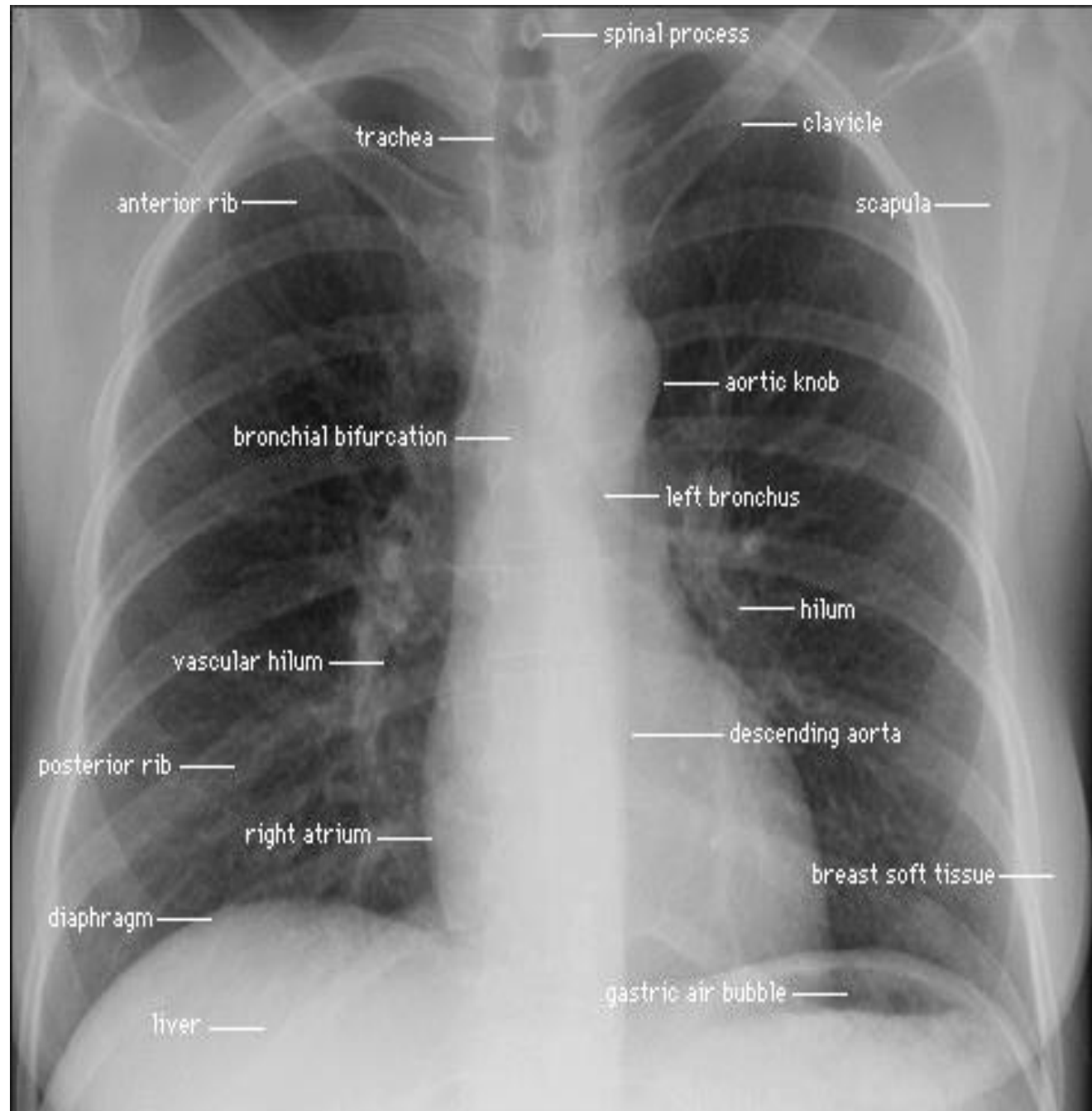
➤ Left ventricle.



# Posteroanterior view (Mediastinum)

➤ The right border of mediastinum;  
consists of:

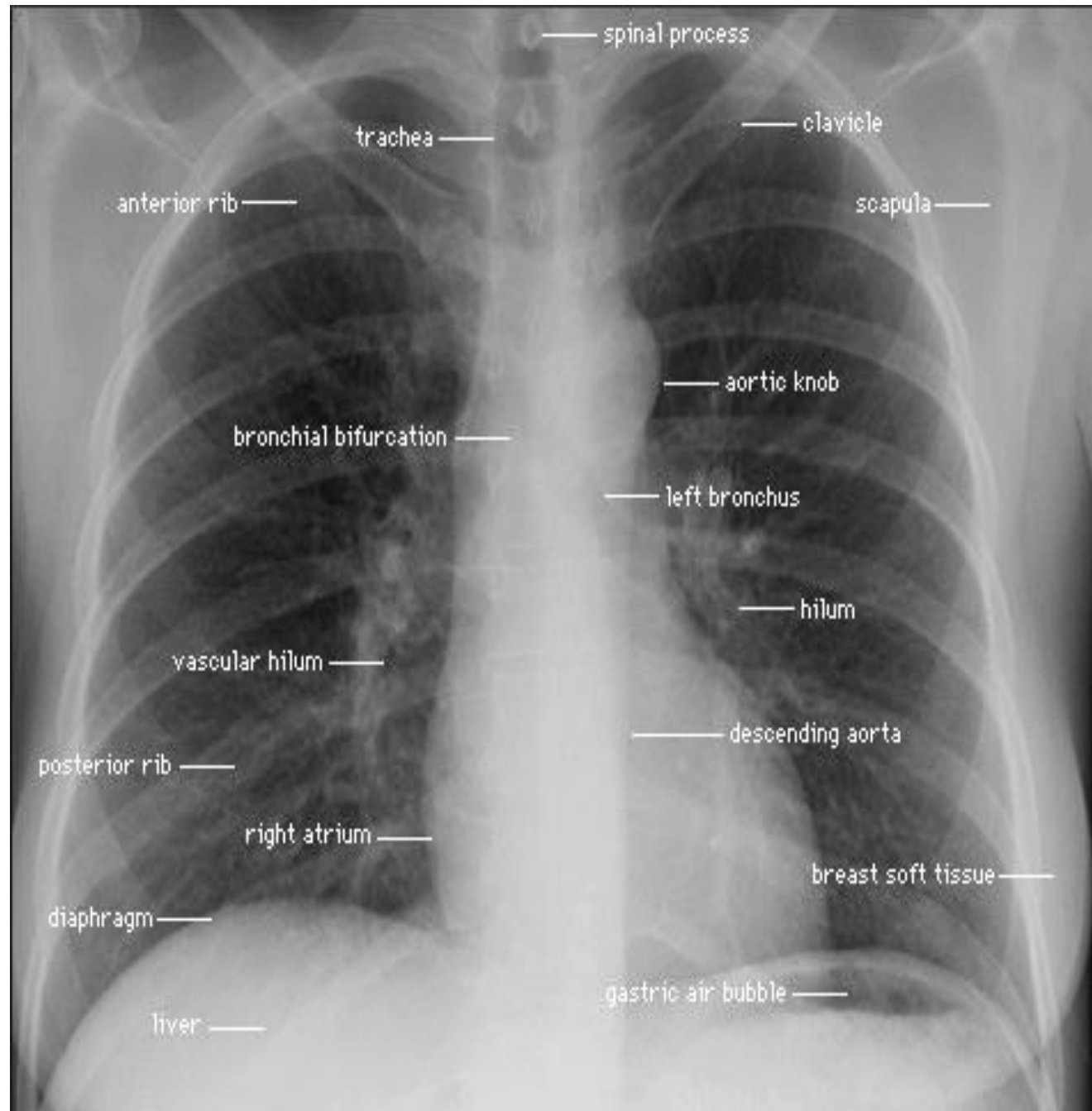
1. Right brachiocephalic vein,
2. Superior vena cava,
3. Right atrium, and
4. Inferior vena cava.



# Posteroanterior radiograph (Mediastinum)

➤ The left border of mediastinum consists of:

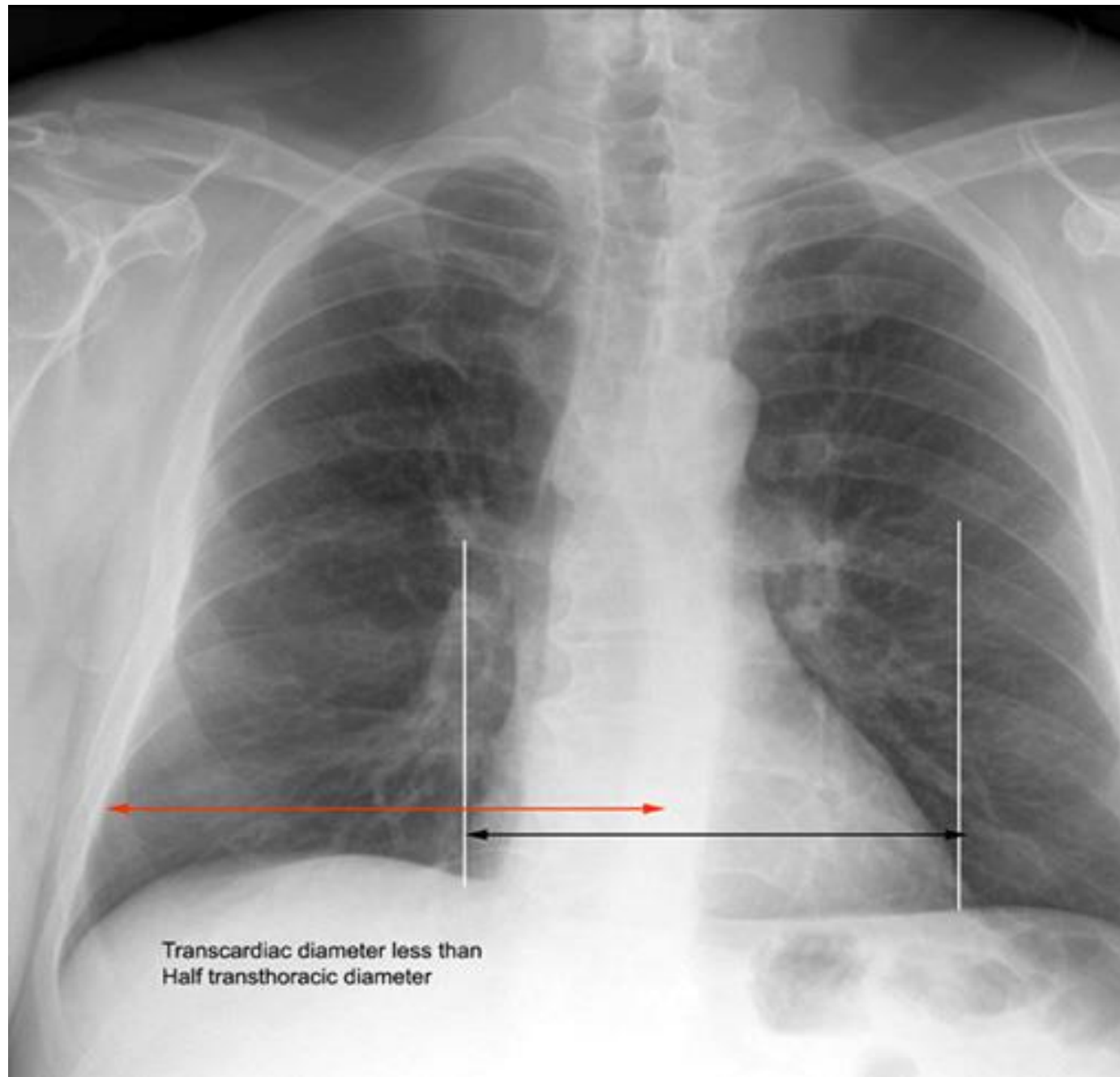
1. Aortic knuckle, or aortic knob (**aortic arch**),
2. Pulmonary trunk,
3. Left auricle, and
4. Left ventricle.



## Posteroanterior radiograph (Mediastinum)

➤ Normally the transverse diameter of the heart **should not** exceed **half** of the width of thoracic cage.

➤ On **deep inspiration**, when the diaphragm **descends**, the vertical length of the heart increases and the transverse diameter is narrowed.

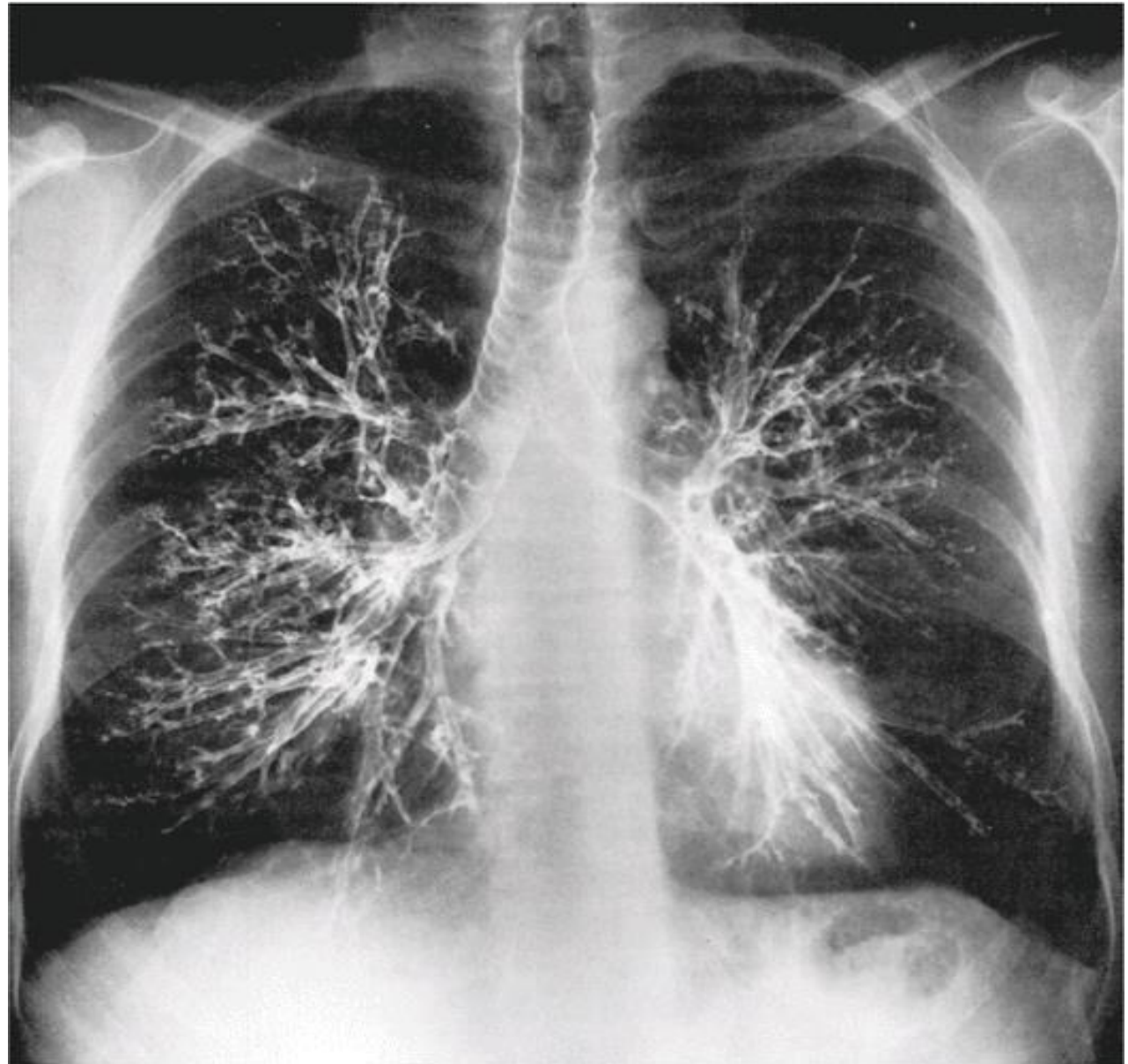




## **Bronchography and contrast visualization of the esophagus**

### **□Bronchography;**

➤It is special study of the bronchial tree by introduction of contrast medium into a particular bronchus.

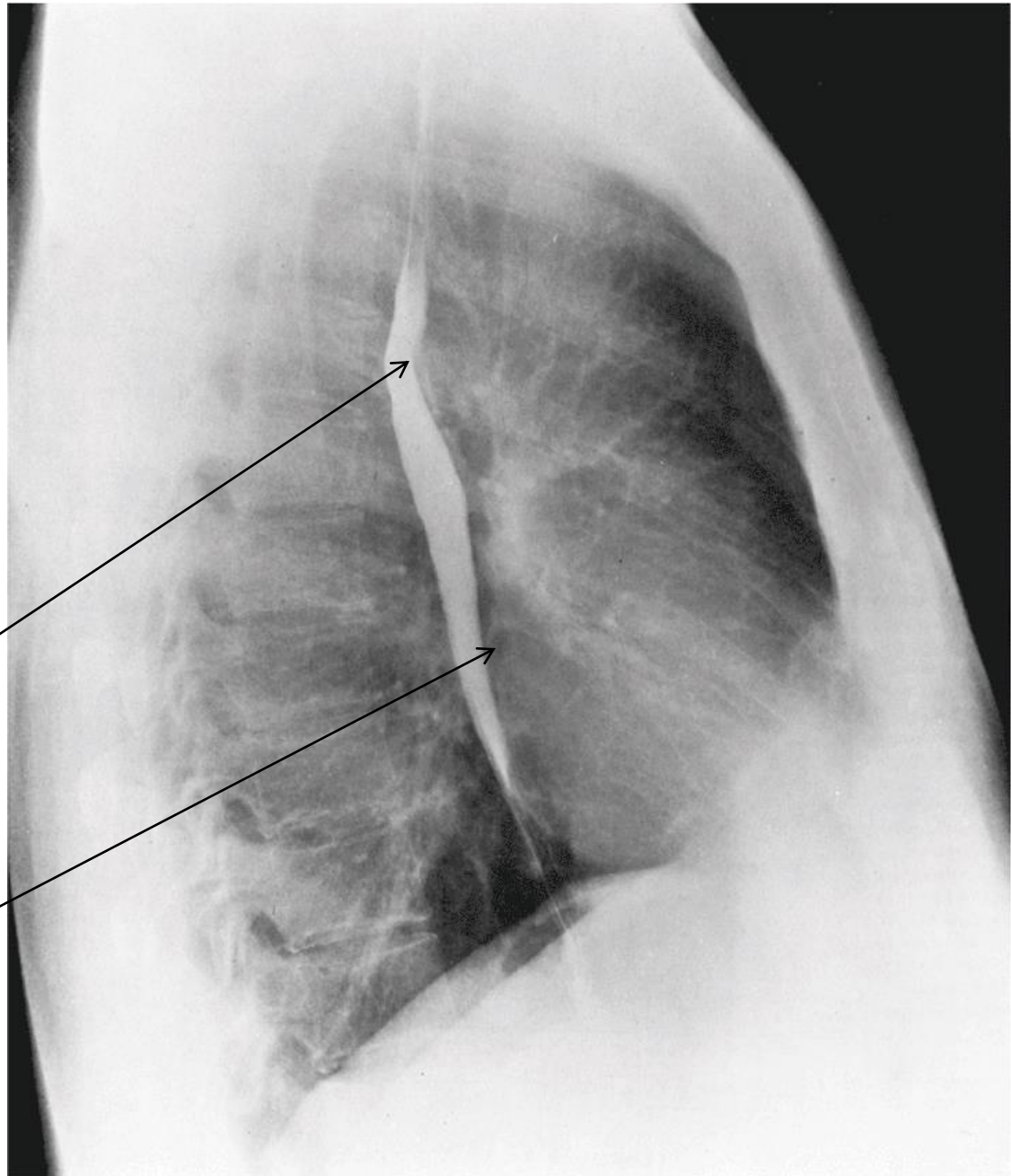


## Bronchography and contrast visualization of the esophagus

❑ Contrast visualization of the esophagus by swallow a contrast media, (barium swallow).

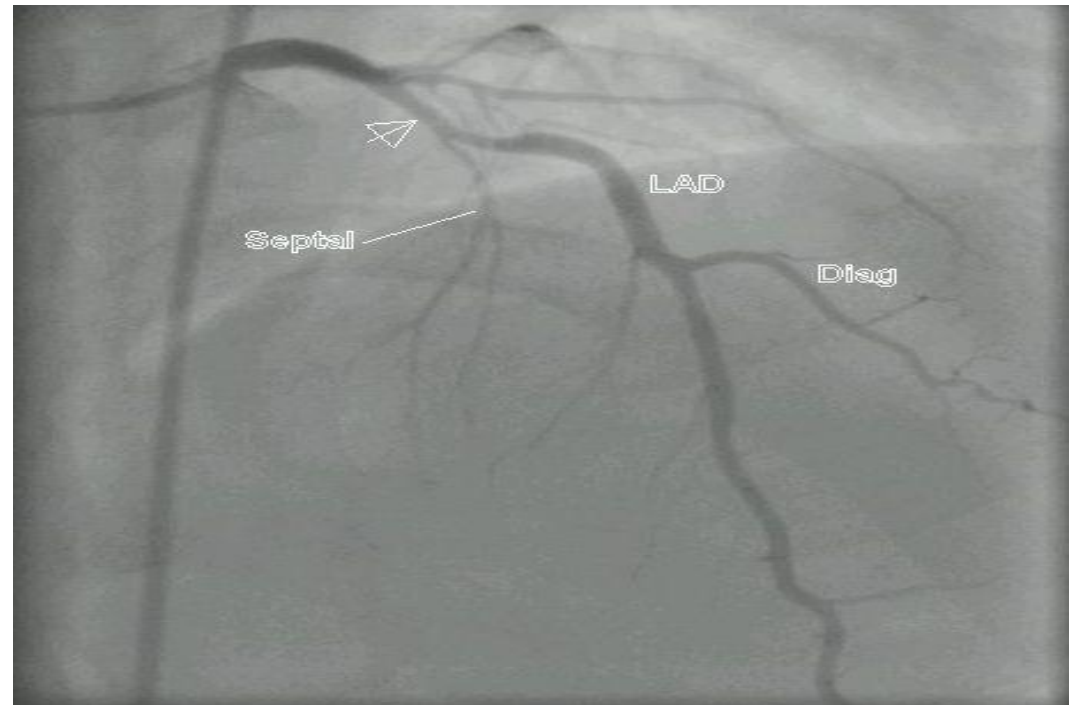
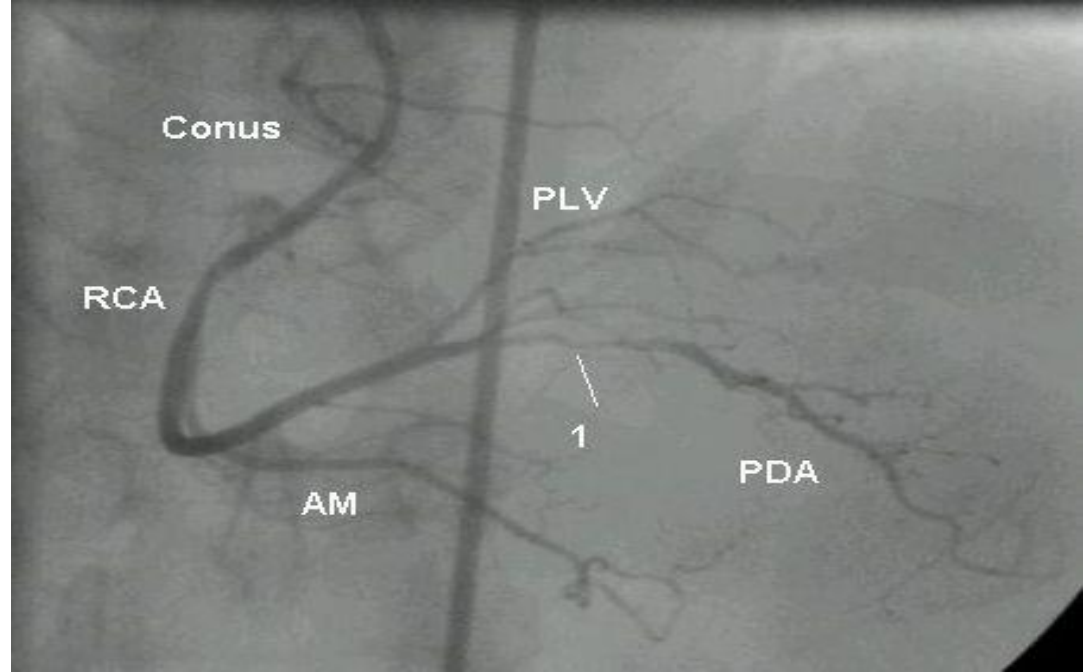
➤ Identification of the aortic arch and left bronchus.

➤ Identification of enlargement of left atrium.



# Coronary Angiography

- The coronary arteries are visualized by introduction of radio-opaque material into their lumen.
- Pathological narrowing or blockage of coronary artery can be identified.





**THANK YOU  
AND  
GOODLUCK**