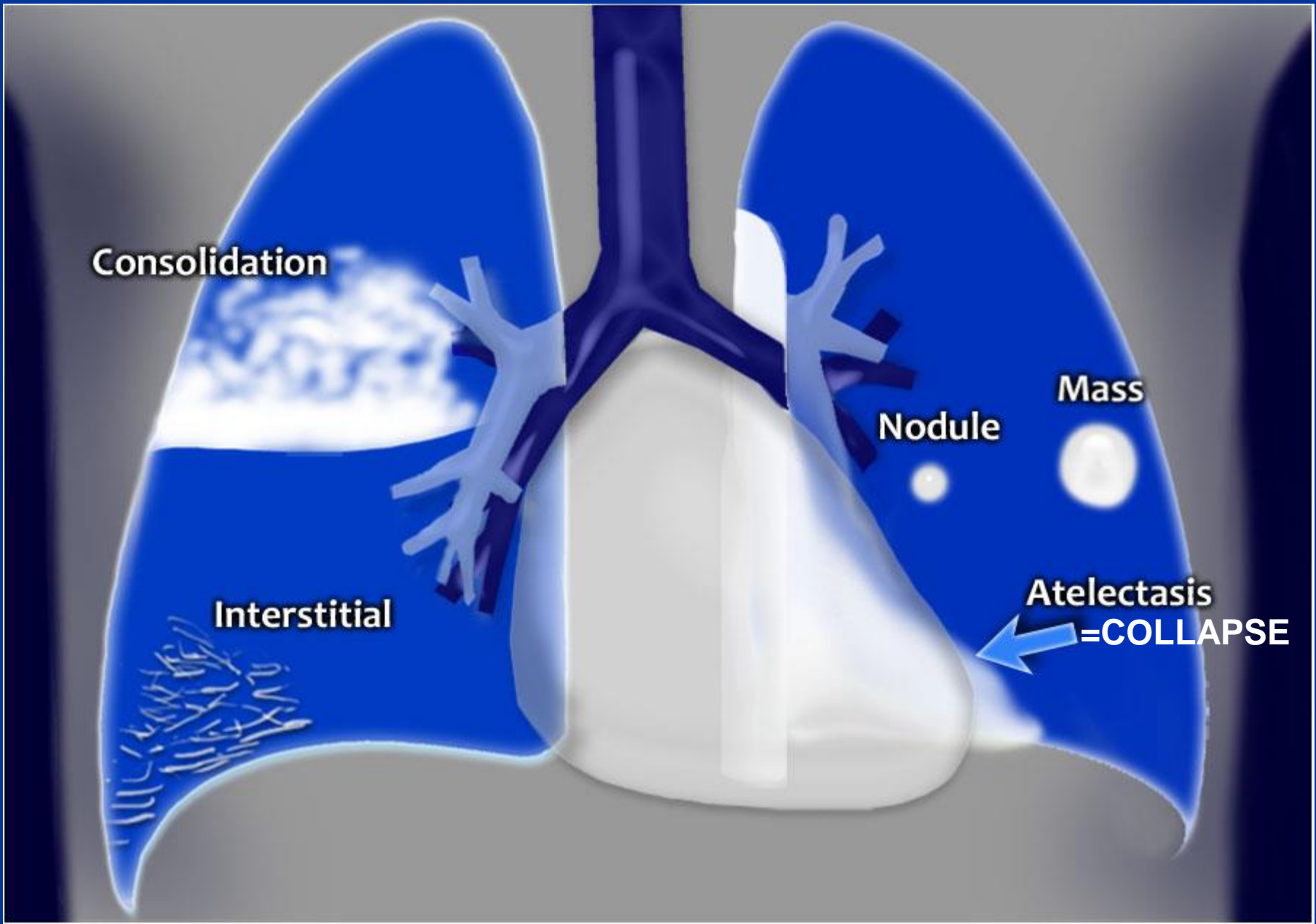


# LUNG DISEASES



**Consolidation**

**Interstitial**

**Nodule**

**Mass**

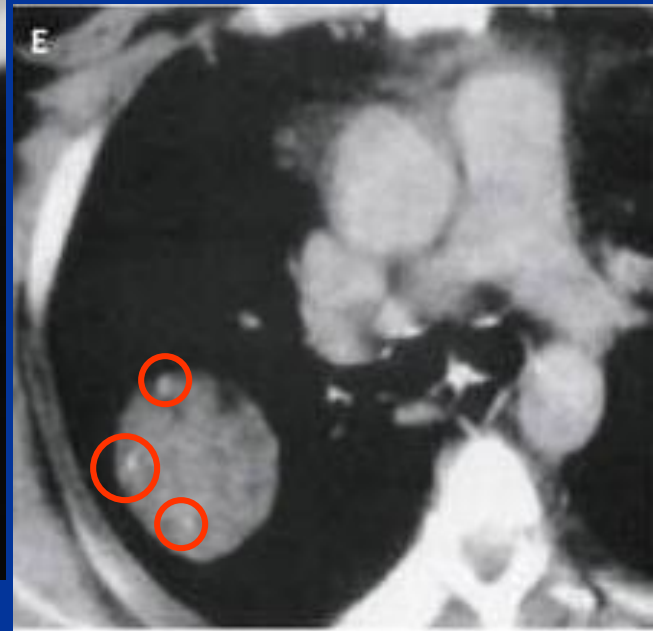
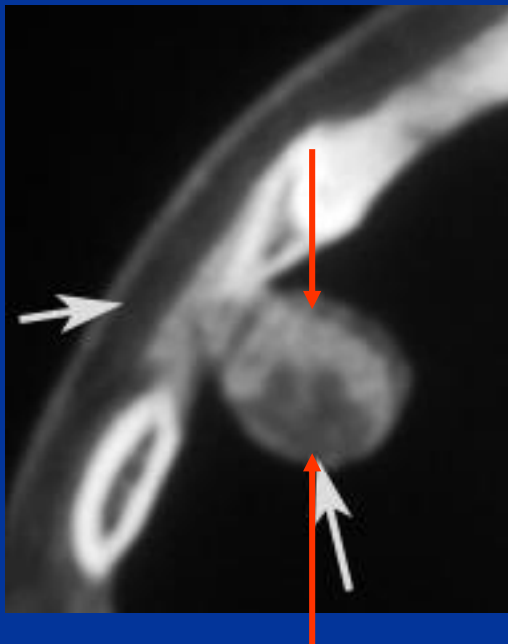
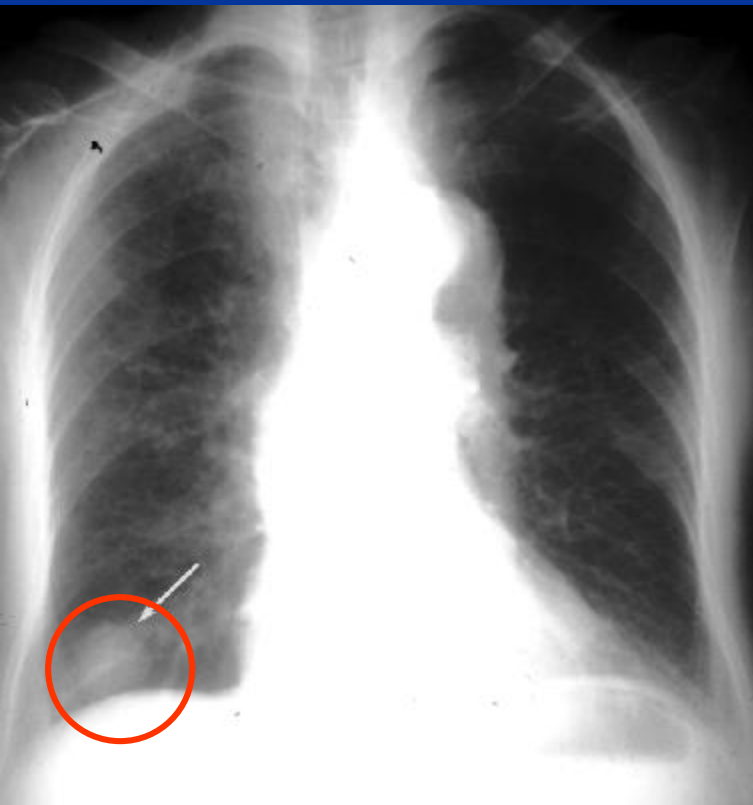
**Atelectasis  
= COLLAPSE**

# MASS Vs DIFFUSE INFILTRATION

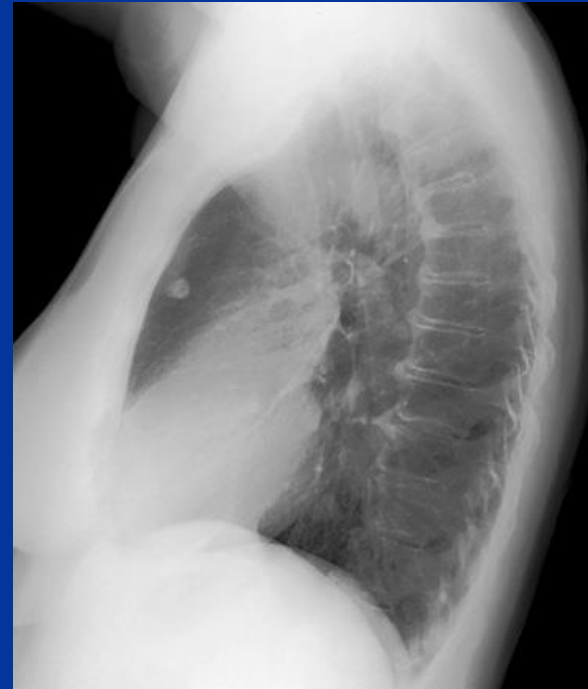
- The basic diagnostic instance is to detect an abnormality.
- In both of the cases, there is an **abnormal opacity** left upper zone.
- In the case ABOVE , the opacity would best be described as a **mass** because it HAS EDGES **well-defined** 3-D STRUCTURE
- The case BELOW has an opacity that is **poorly defined**. This is airspace disease such as **pneumonia**.



# MASS HAMARTOMA

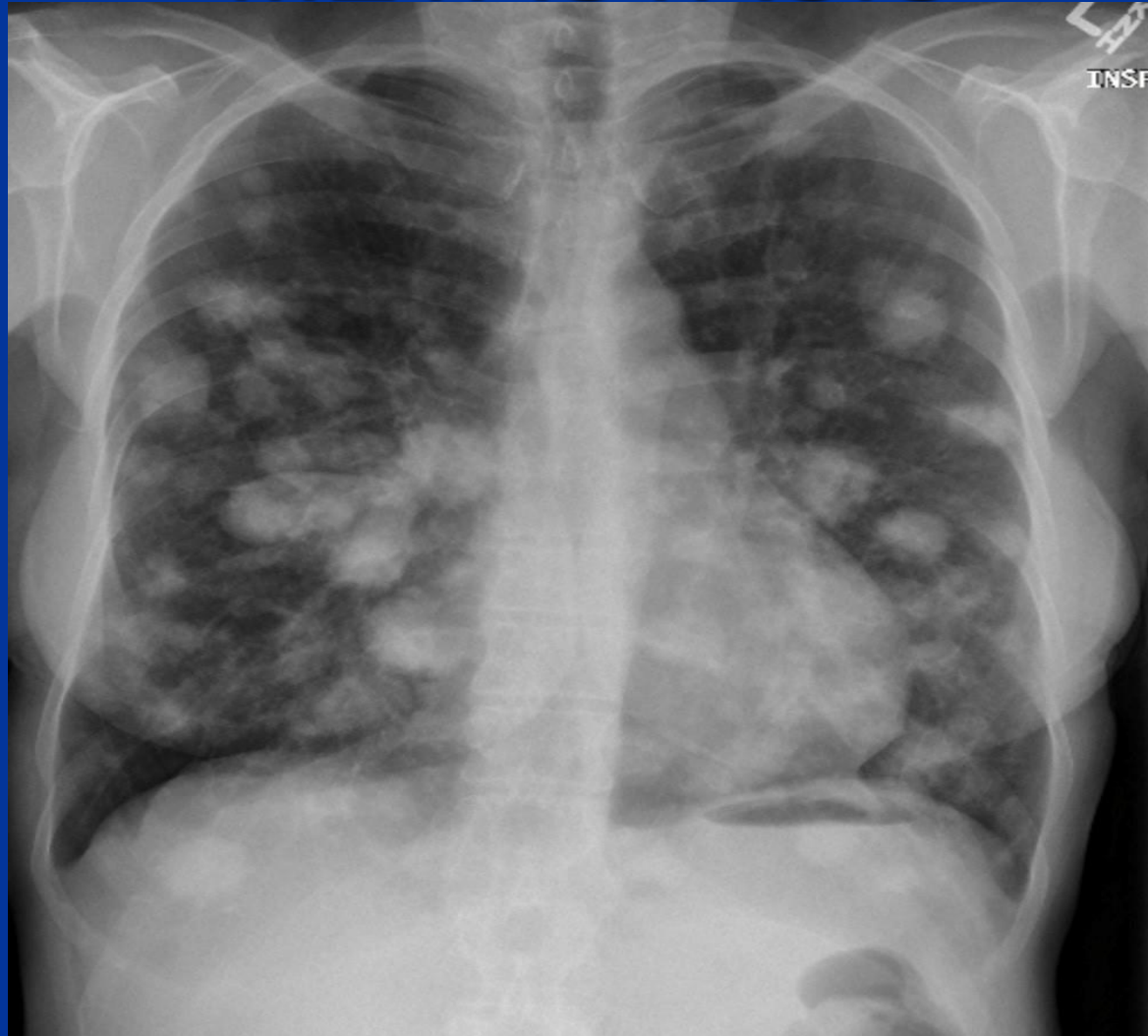


# solitary nodule in the lung

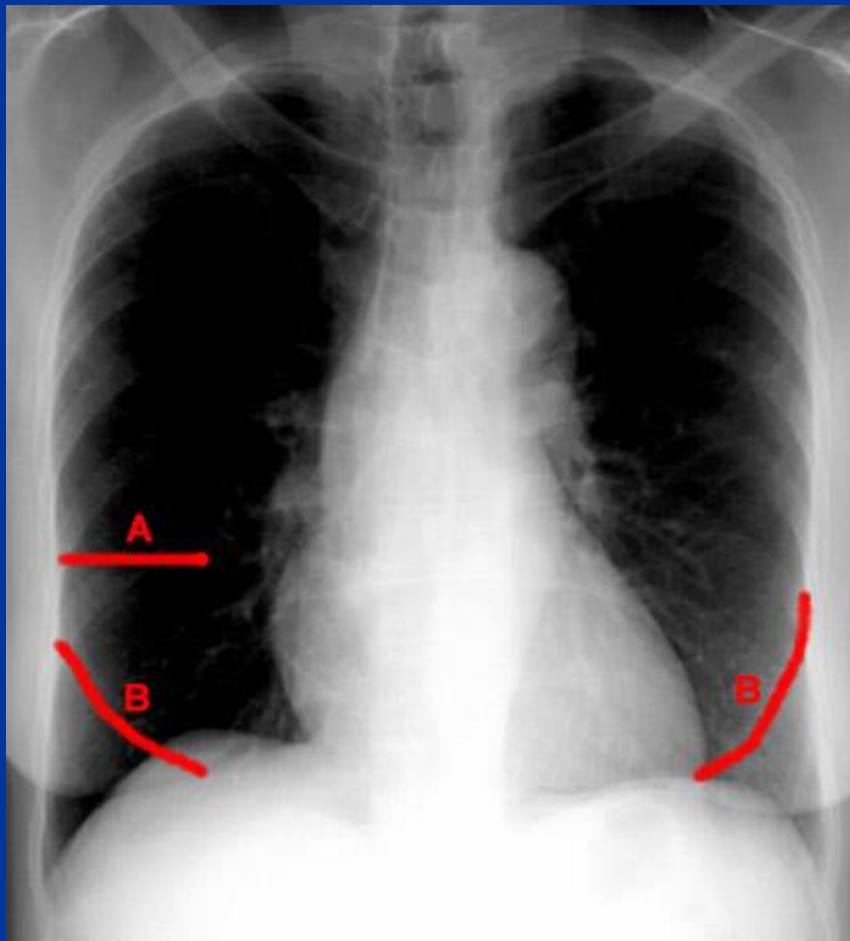


- A solitary nodule in the lung can be totally innocuous or potentially a fatal lung cancer. After detection the initial step in analysis is to compare the film with prior films if available. A nodule that is unchanged for two years is almost certainly benign. Be sure to evaluate for the presence of **multiple nodules** as this finding would change the differential entirely.
- If the nodule is indeterminate after considering old films and calcification, subsequent steps in the work-up include ordering a CT and a tissue biopsy.

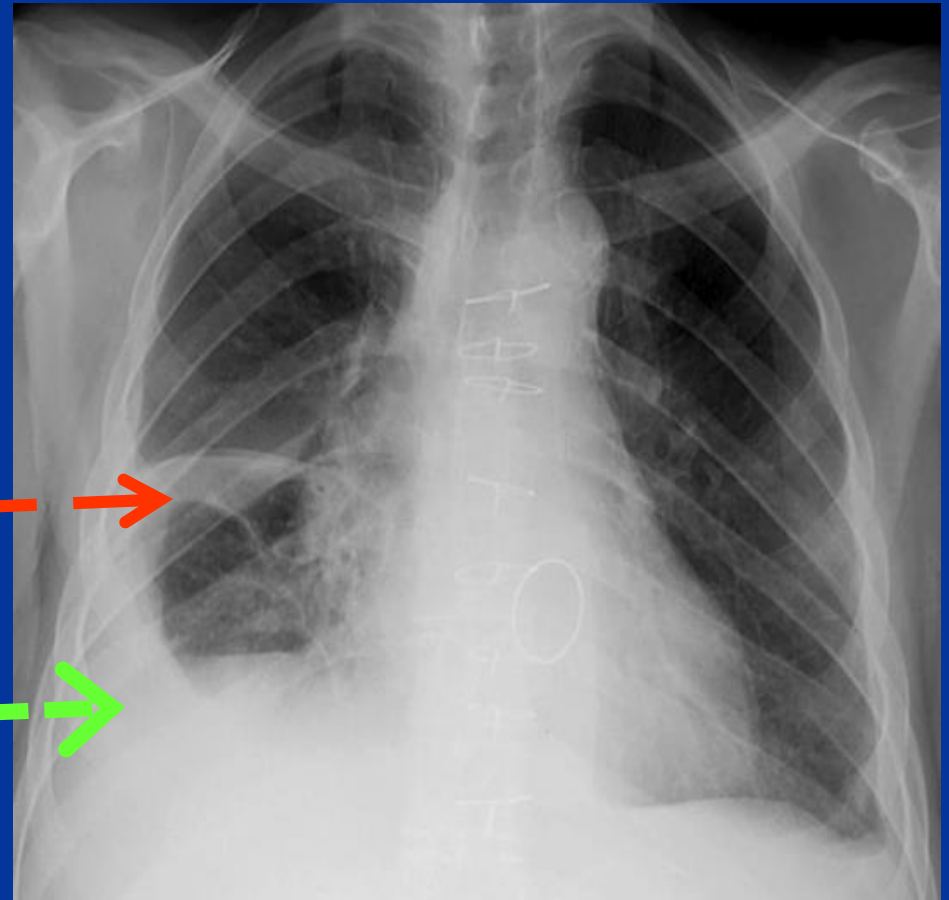
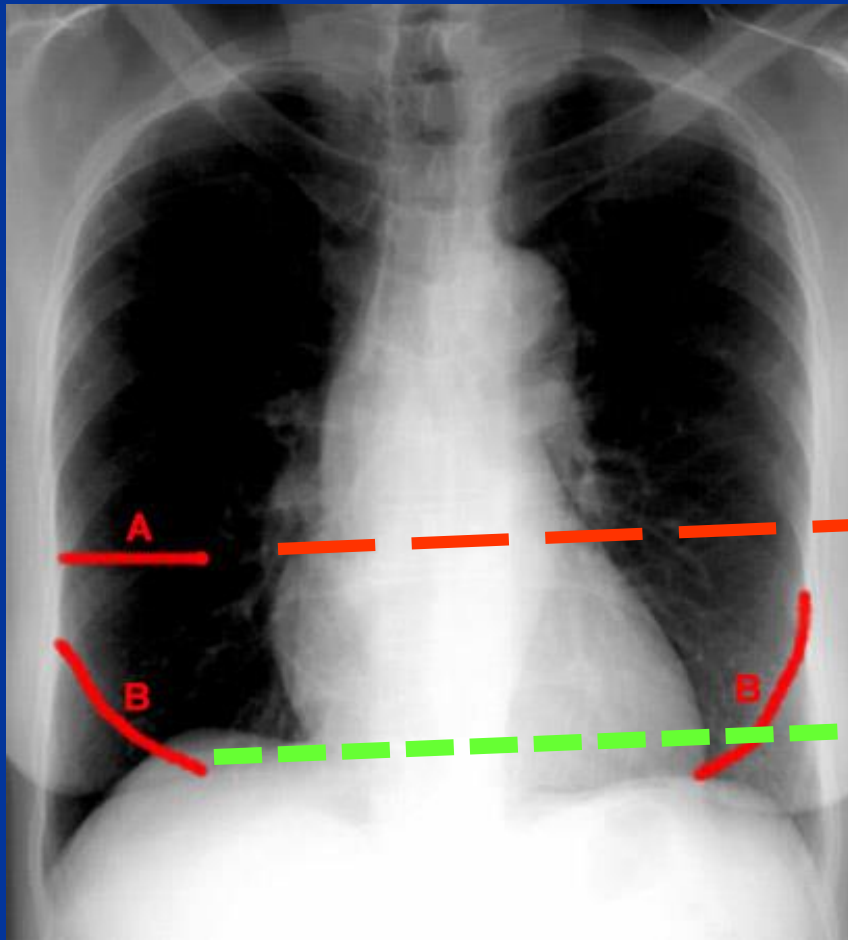
# MULTIPLE NODULES METASTASIS



# FISSURES



# FISSURES





# ***DEFINITIONS***

- **ATELECTASIS**

Loss of volume of lobe, segment or sub segment of the lung.

*Example collapse (lung)*

- **Consolidation**

Loss & replacing of air in lobe, segment or sub segment of the lung.

*Example= pneumonia (lobe)*

# Major differentiating factors between atelectasis and pneumonia

## Atelectasis

**Volume Loss**

**Associated Ipsilateral Shift**

**Linear, Wedge-Shaped**

**Apex at Hilum**

## Pneumonia

**Normal or Increased Volume**

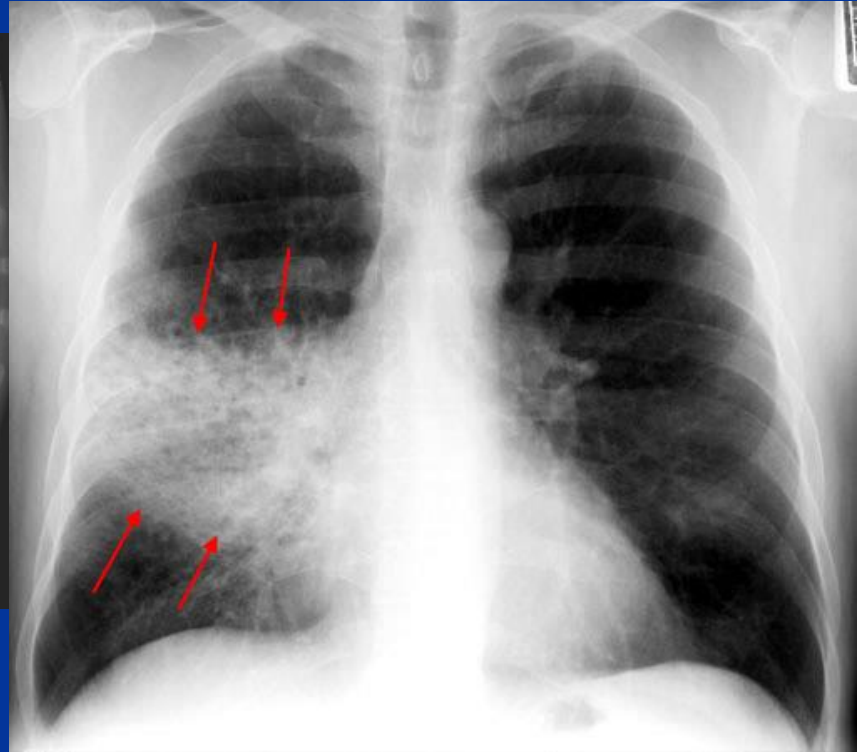
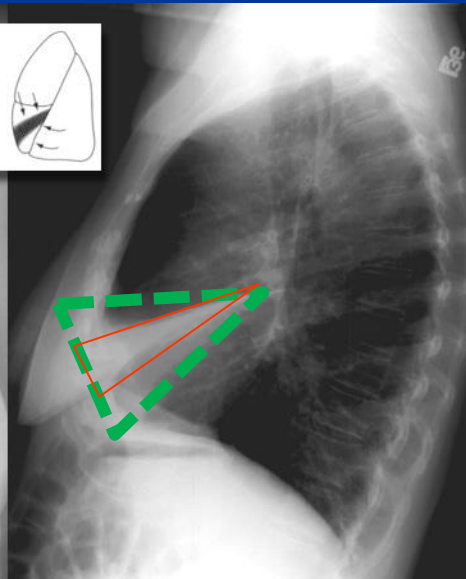
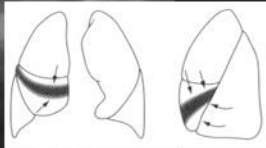
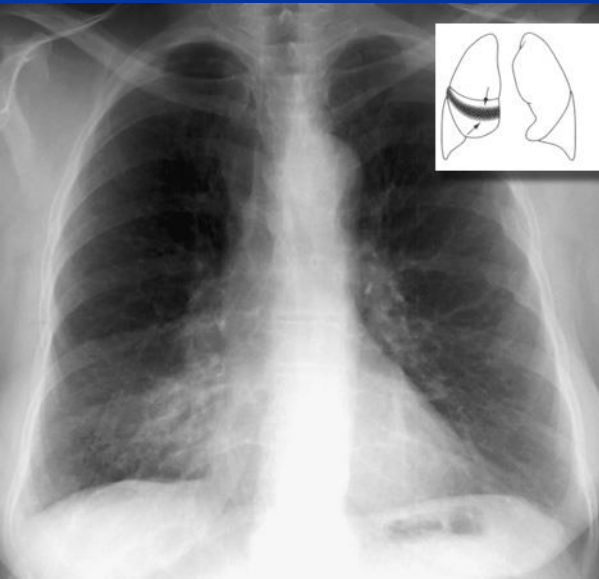
**No Shift, or if Present Then Contralateral**

**Consolidation, Air Space Process**

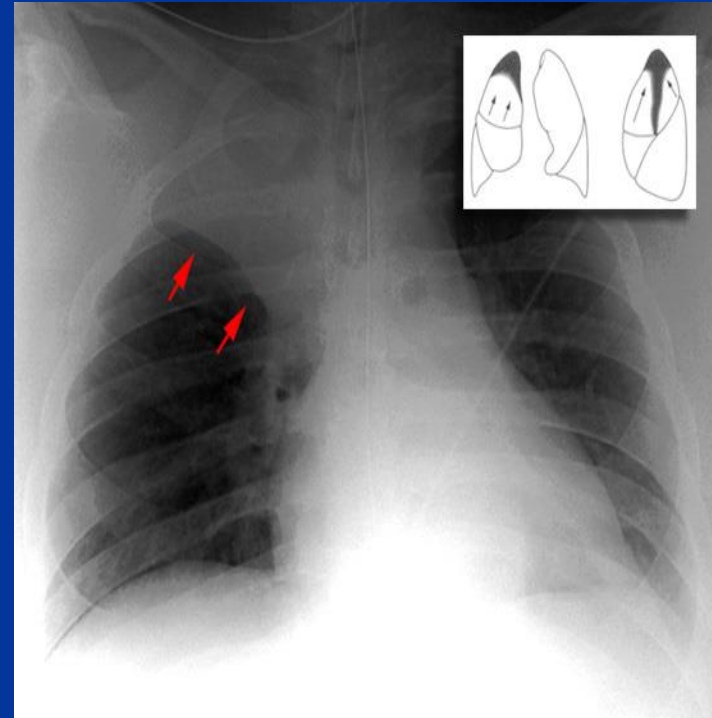
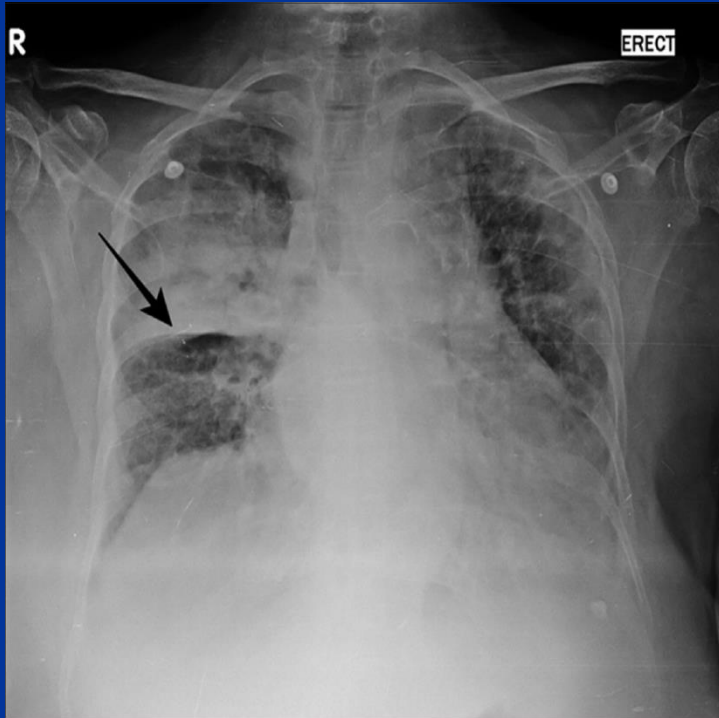
**Not Centered at Hilum**

**Air bronchograms can occur in both.**

# ATELECTASIS VS PNEUMONIA



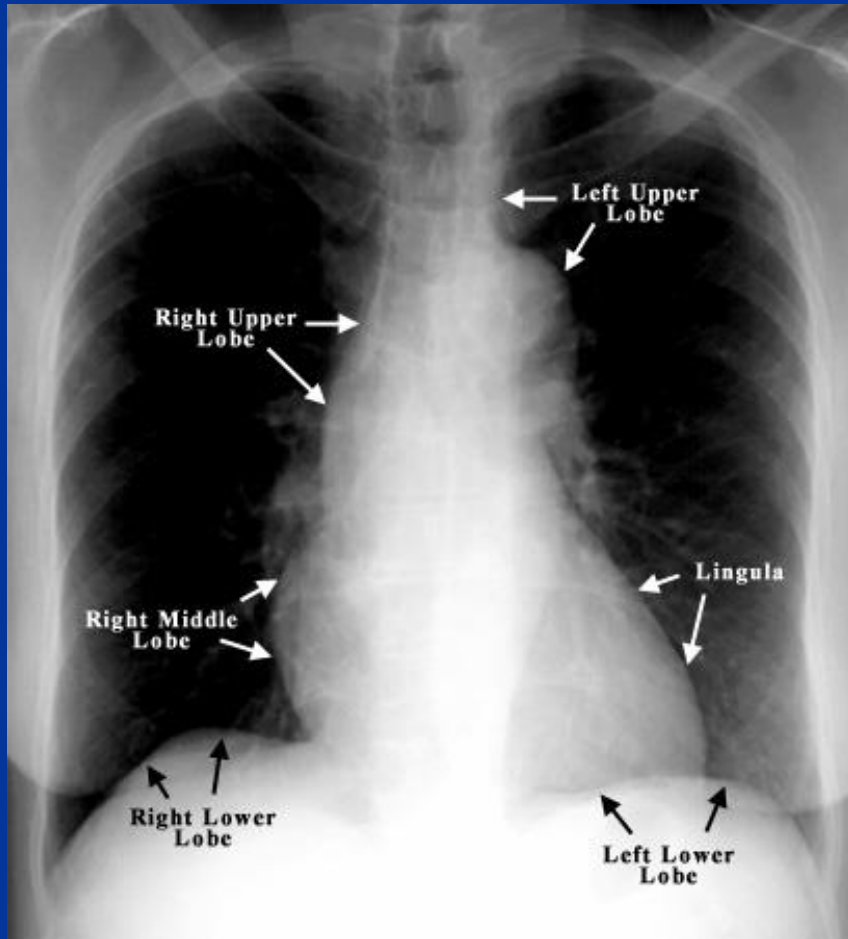
# PNEUMONIA VS ATELECTASIS



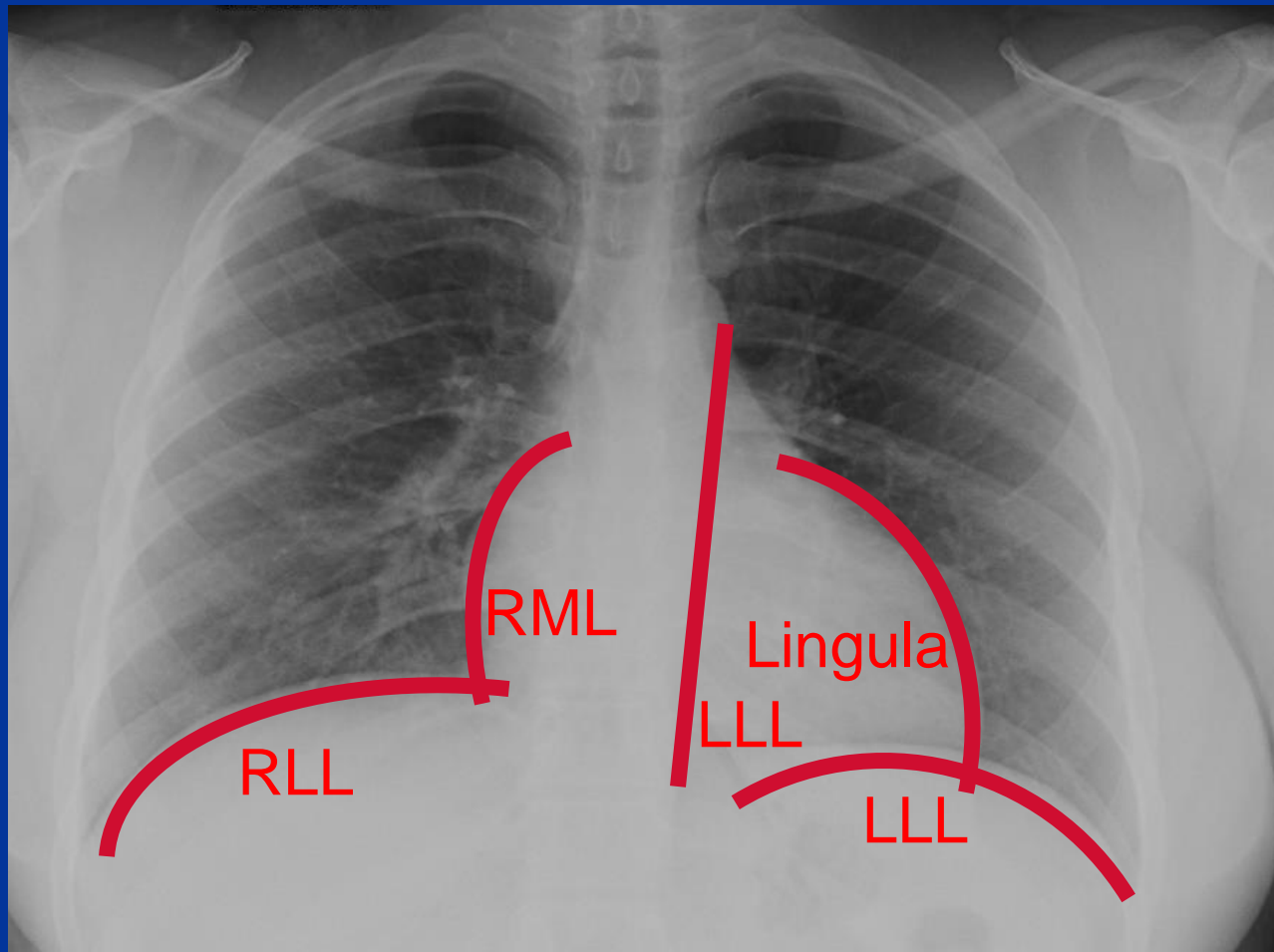
# Recognizing air space disease

- Alveolar spaces replaced from air and filled with...something.
- Nonspecific:
  - Pneumonia, bleeding, edema, tumor.
- Radiologist's report:
  - “consolidation”
  - “air space opacity”
  - “fluffy density”
  - “infiltrate”

# SILHOUETTE SIGN



# Localizing disease from the silhouette sign

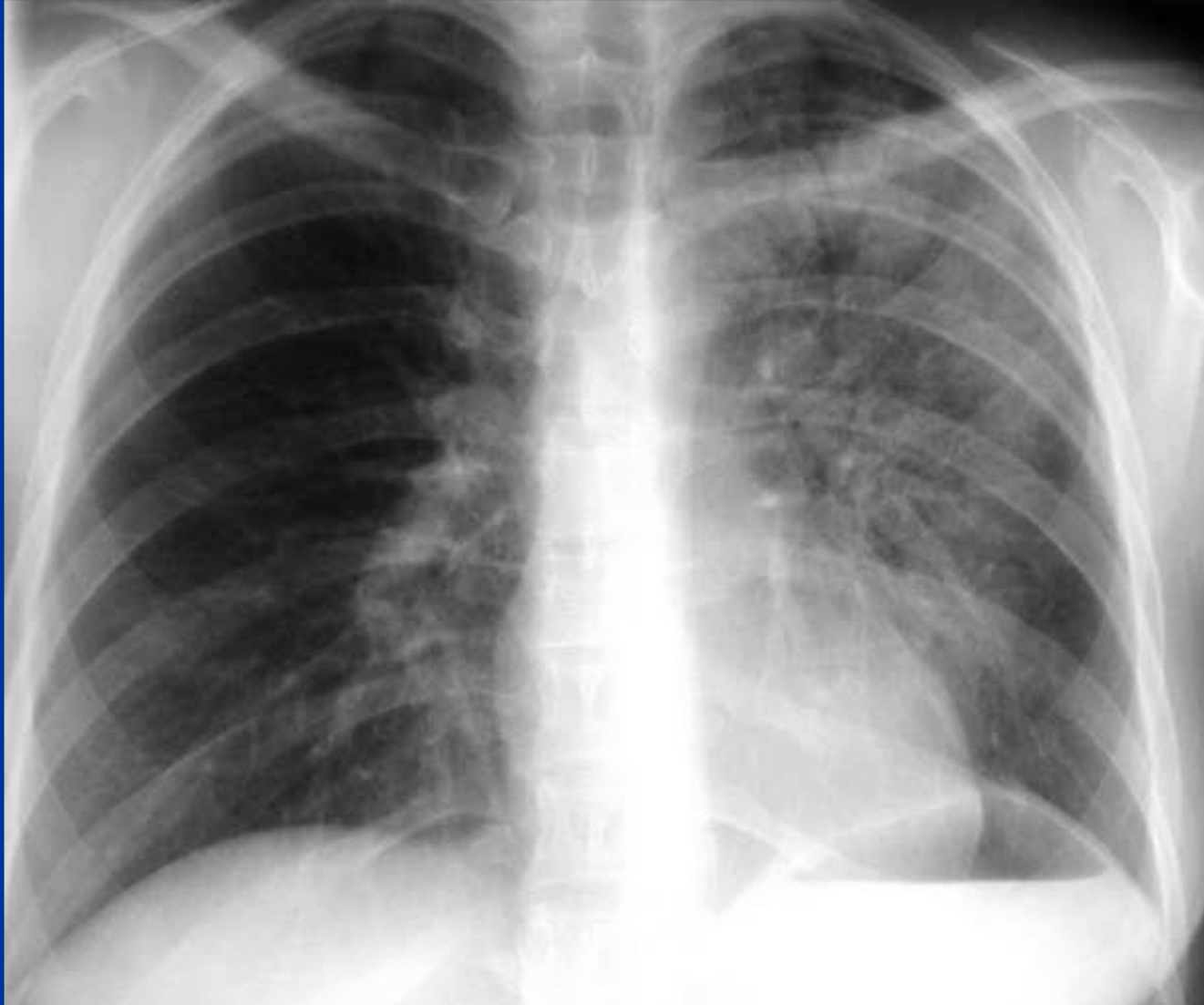


# Pneumonia

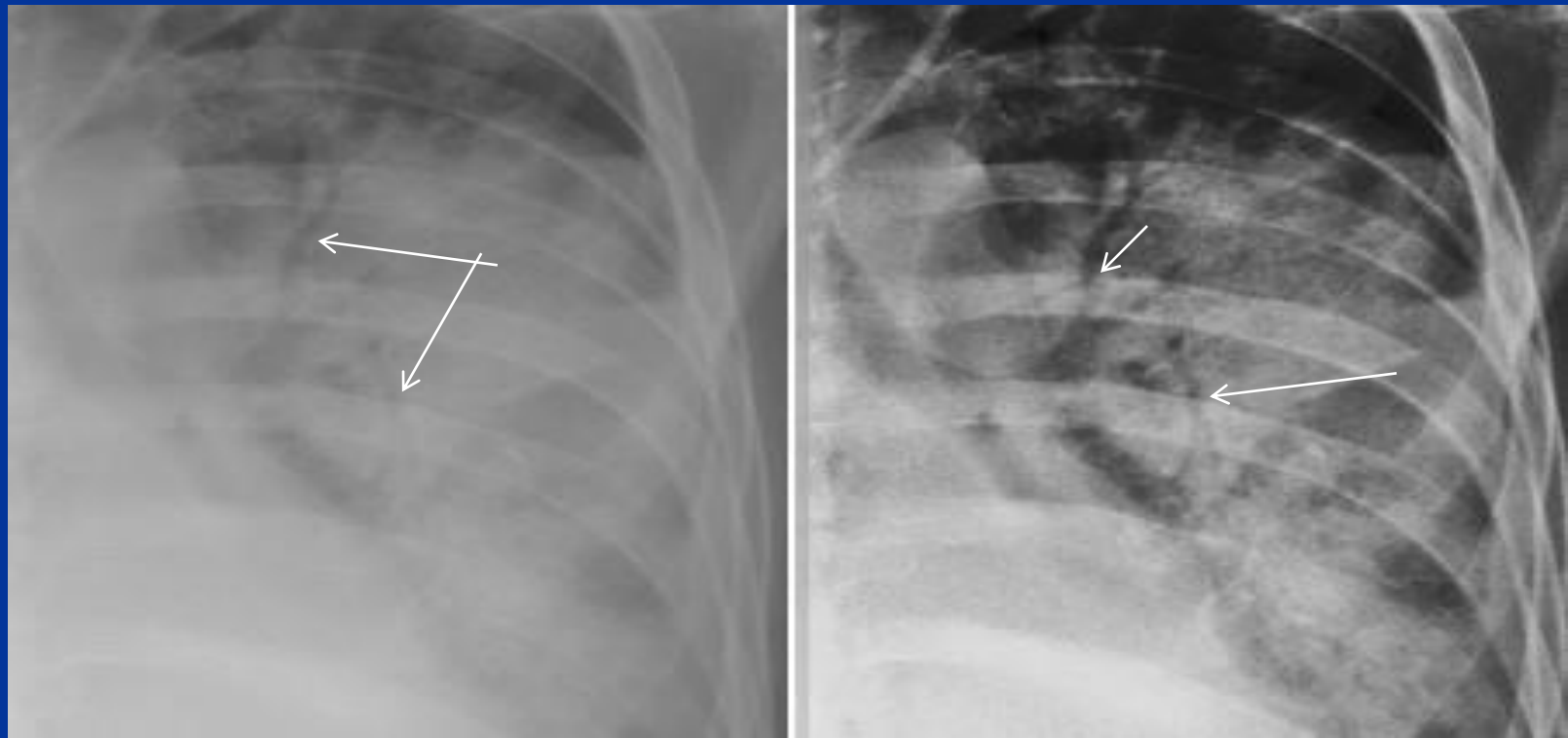
- Signs:
  - Air bronchogram
  - Silhouette - “positive” or “negative”
  - Dense hilum
  - “Spine” sign ( On lateral film )
- All are signs of any air space process
- Dx of pneumonia depends on appropriate clinical scenario.



# AIR-BRONCHOGRAM



# Air bronchogram sign

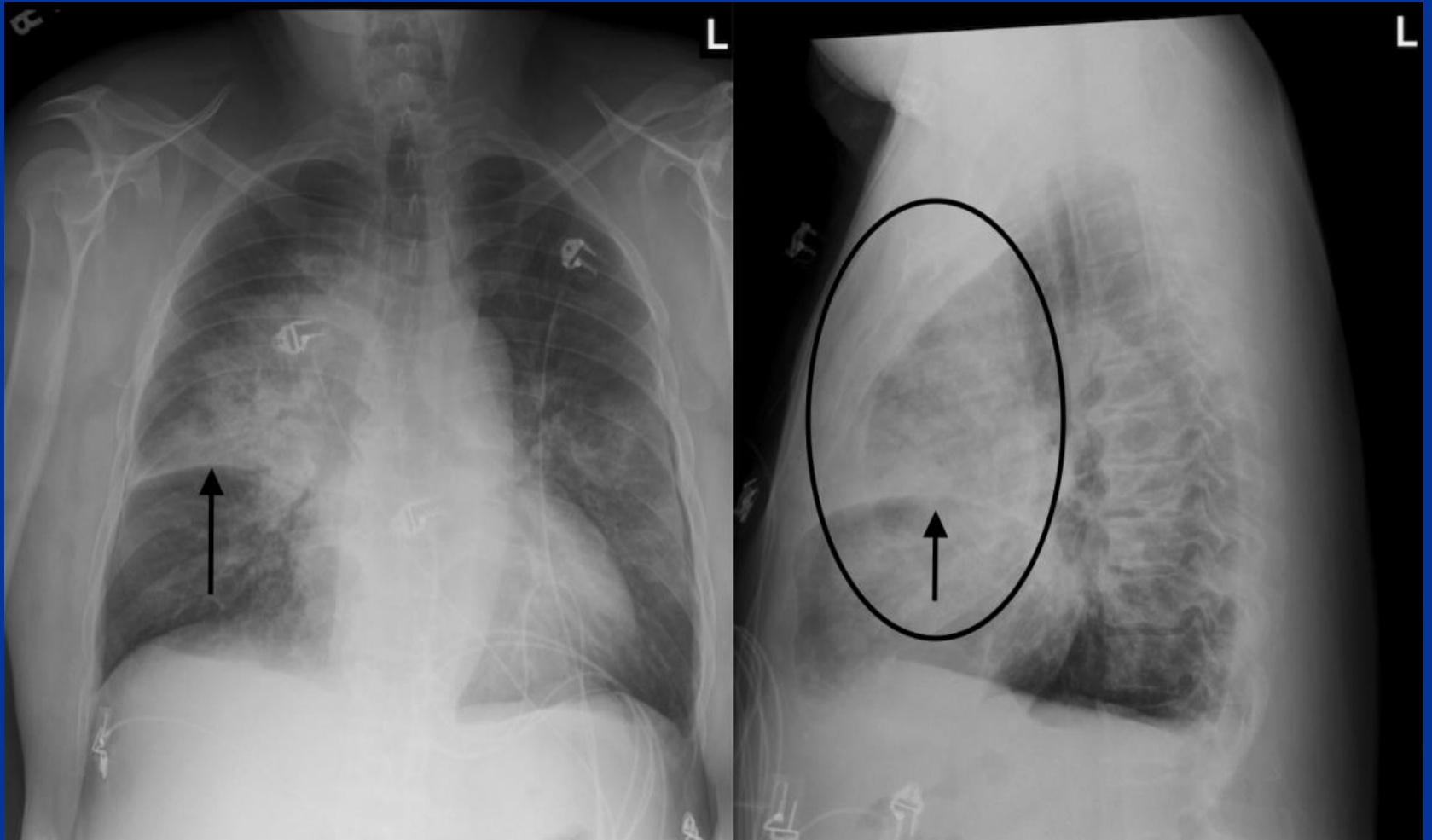


# Air bronchograms — CT



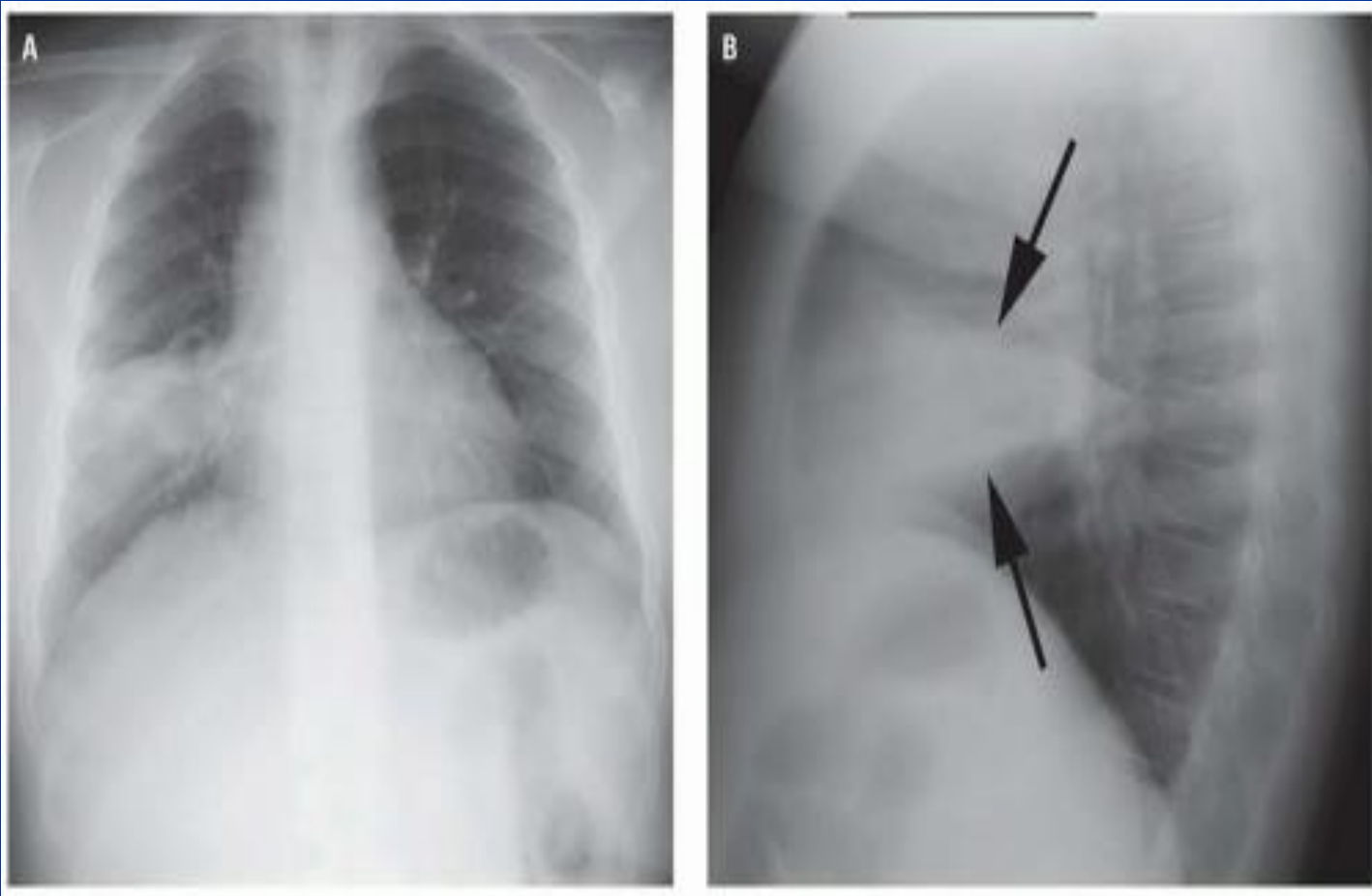
**Pneumonia**

# Right upper lobe



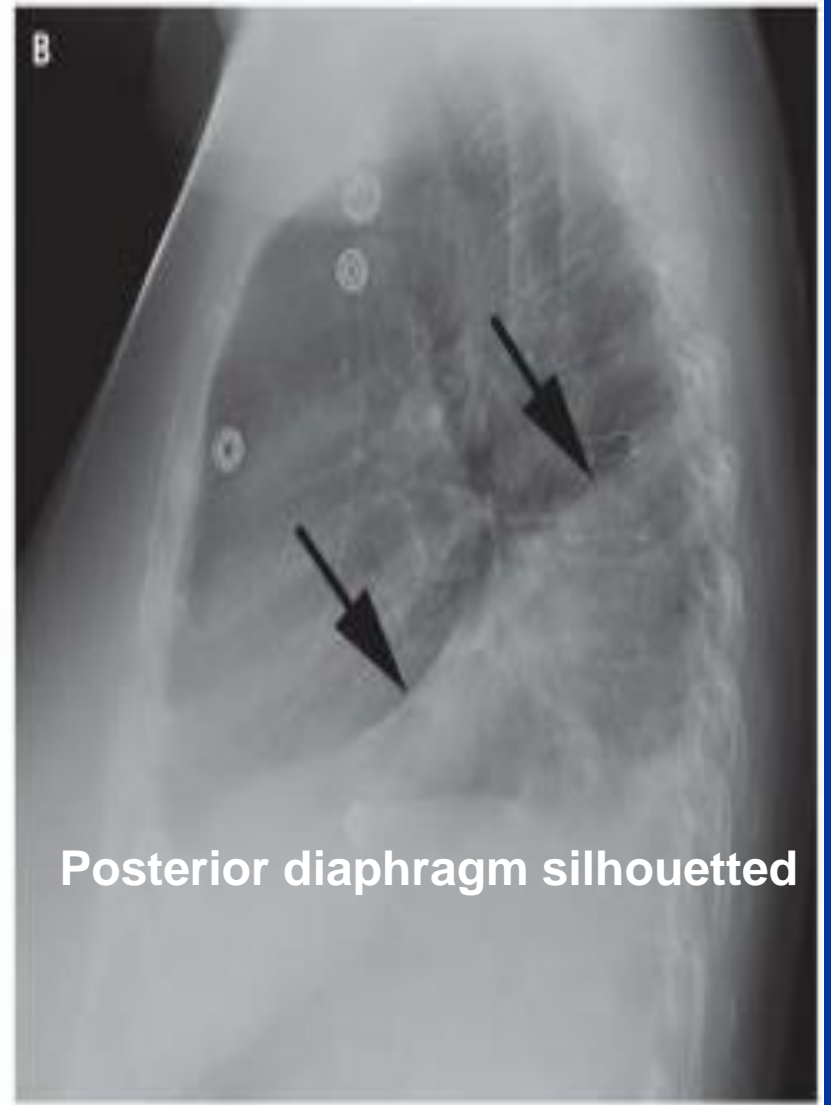
Pneumonia

# Right middle lobe



Pneumonia

# Right lower lobe

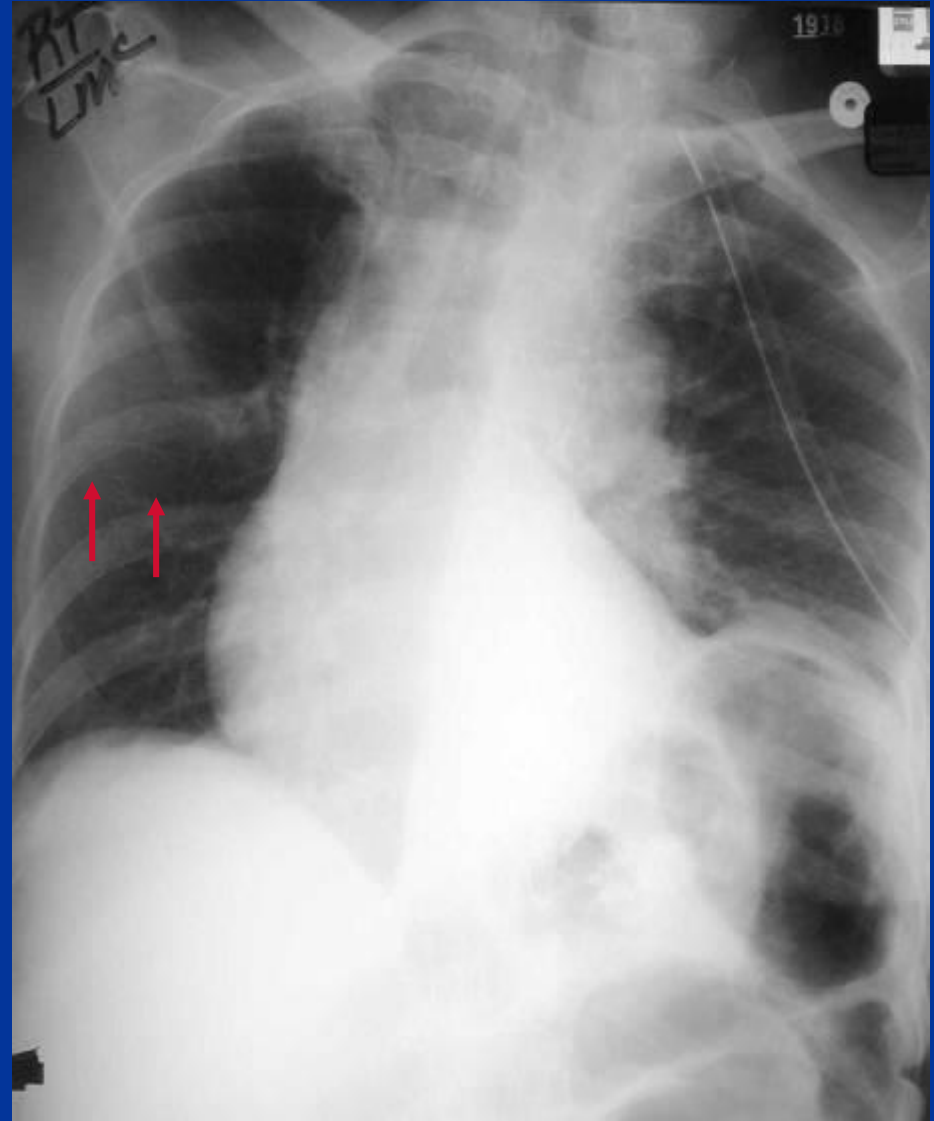


**Pneumonia**

# Lobar Atelectasis

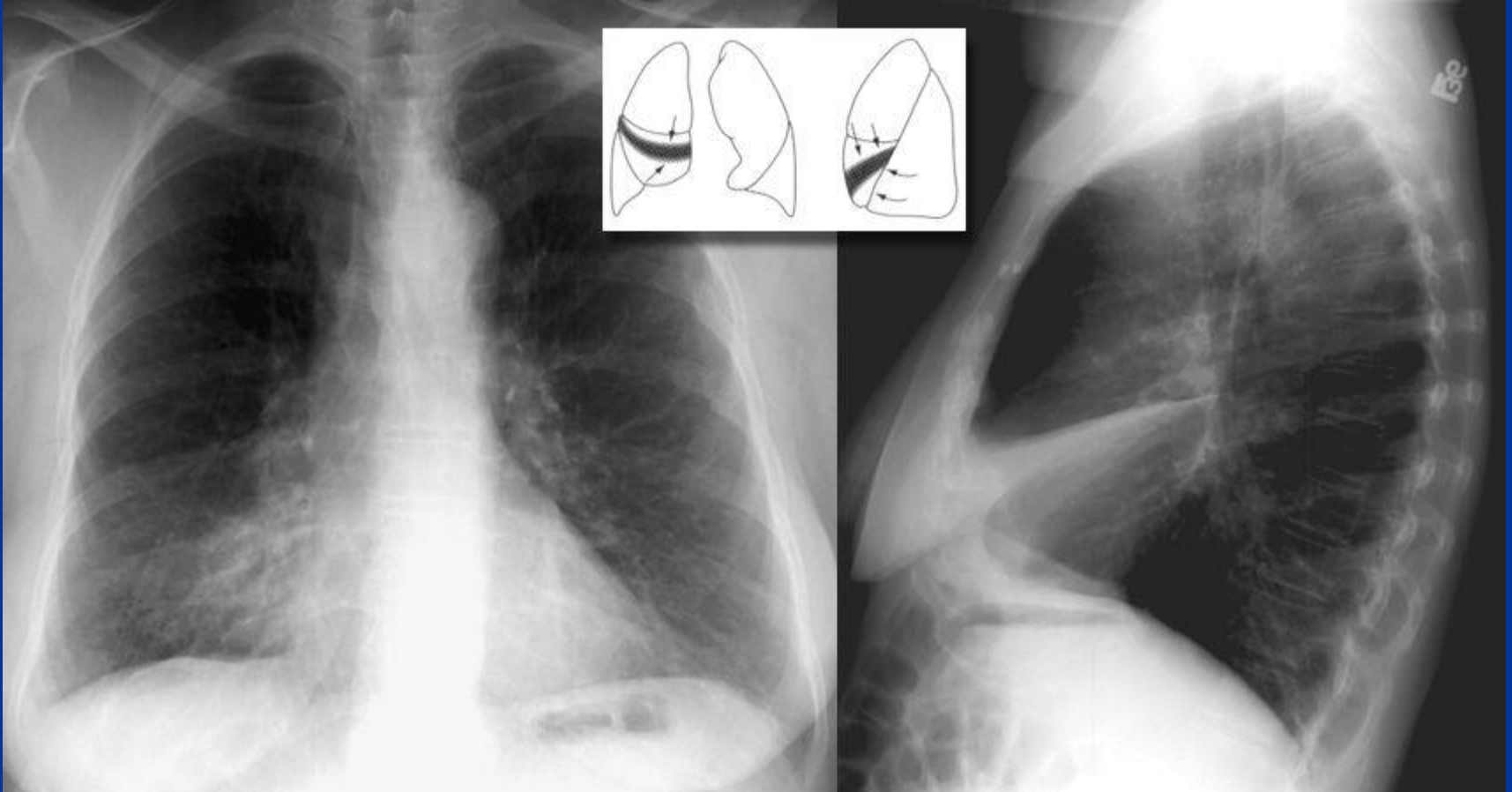
- Best sign – **shift of a fissure**
- Rapid development and clearance
- **Air bronchograms not common** , but if non-obstructive
- Secondary signs:
  - Mediastinal shift
  - Elevated diaphragm
  - Ribs closer together
  - Vague increased density

# RUL Atx

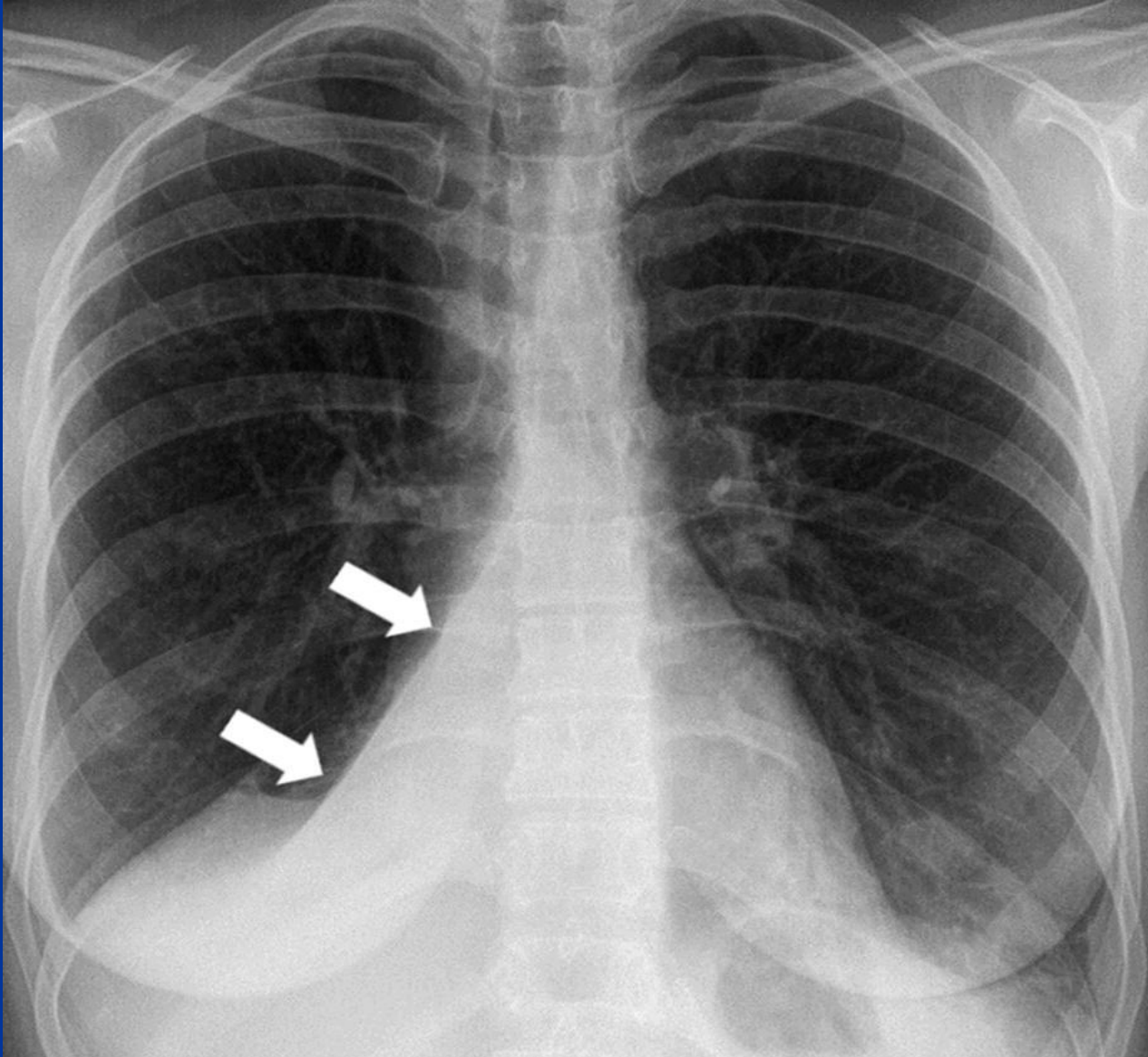




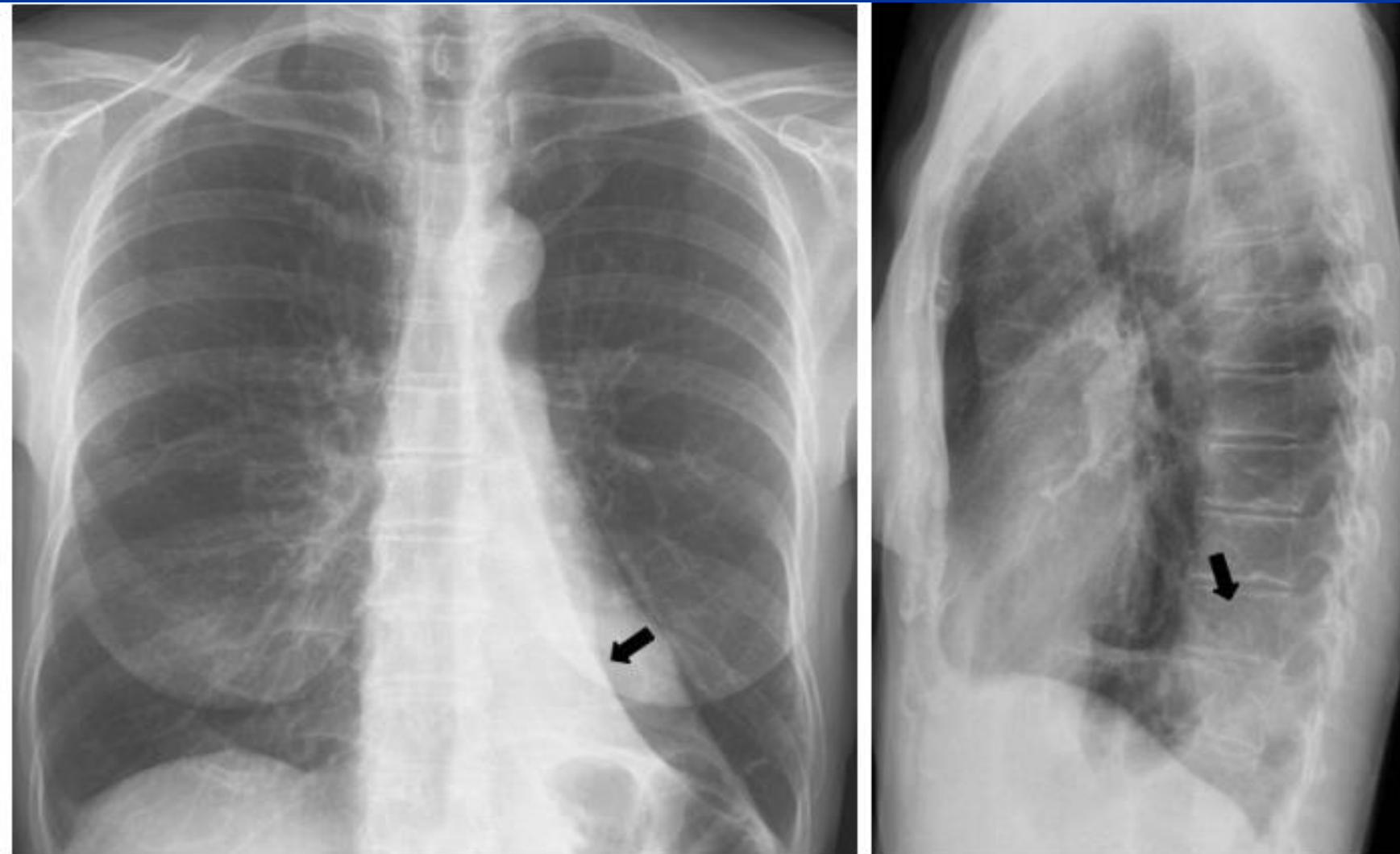
# RML Atx



# RLL COLLAPSE

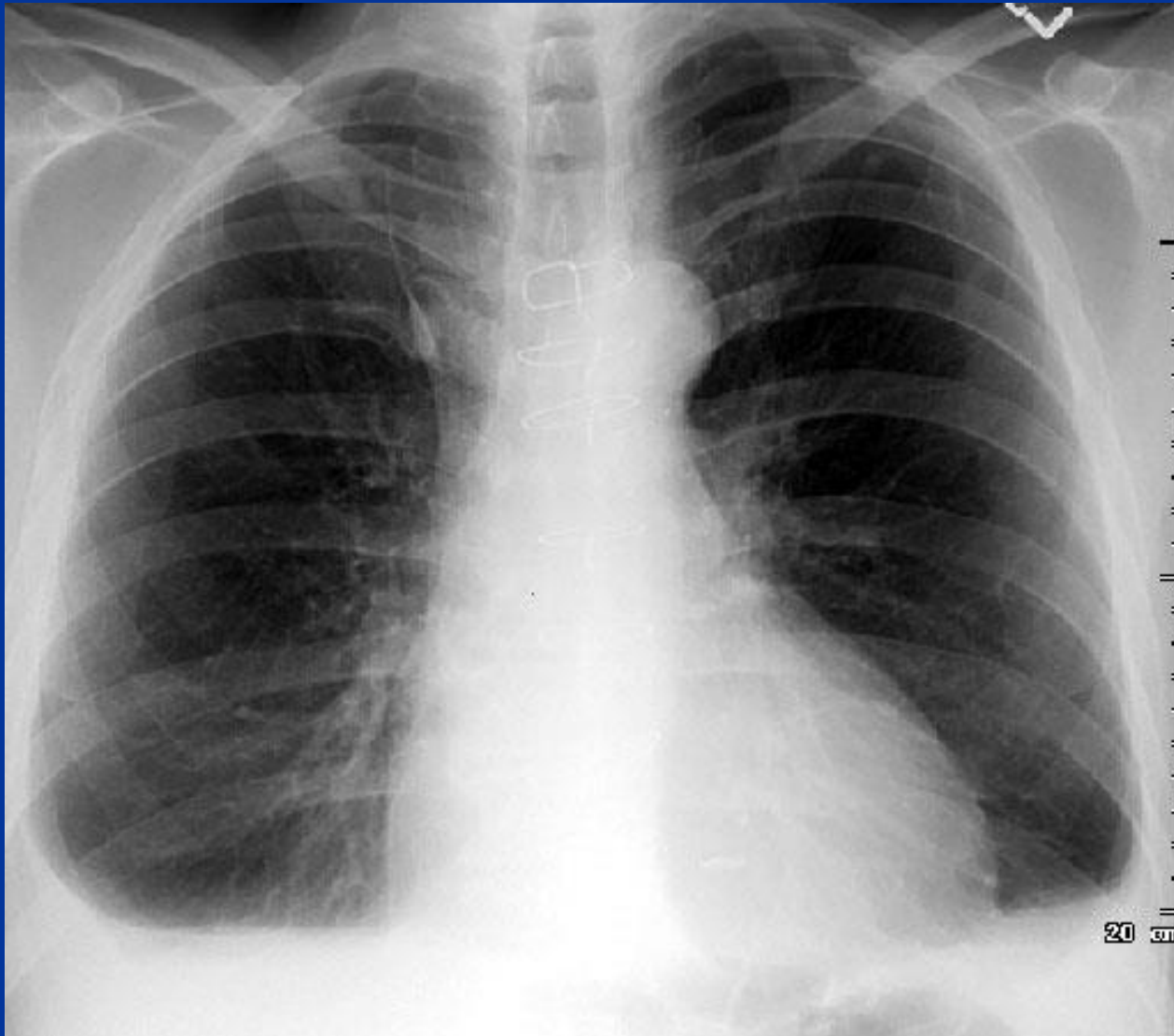


# LLL COLLAPSE

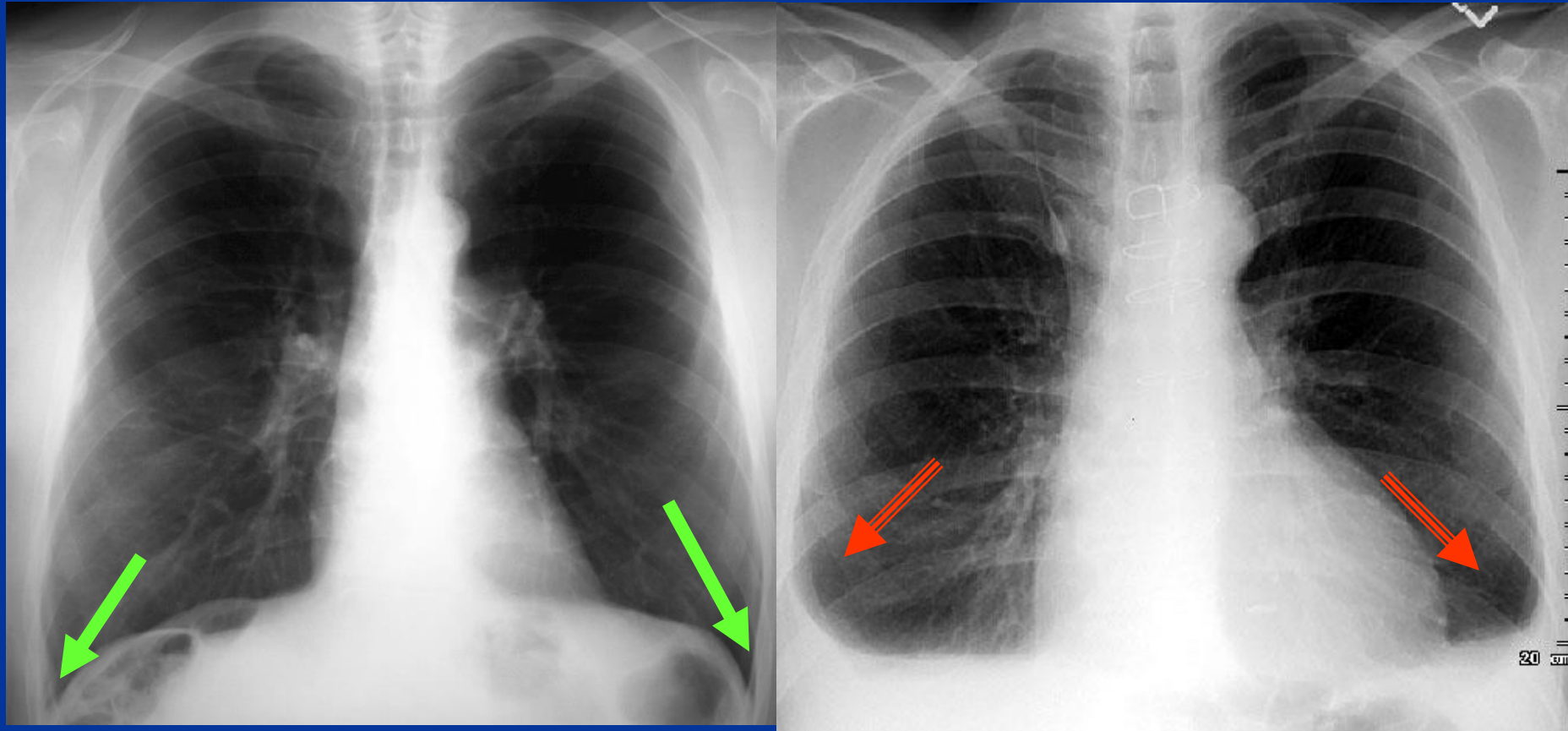


**Fig. 9 PA (right) and lateral (left) chest radiographs in a patient with tight left**

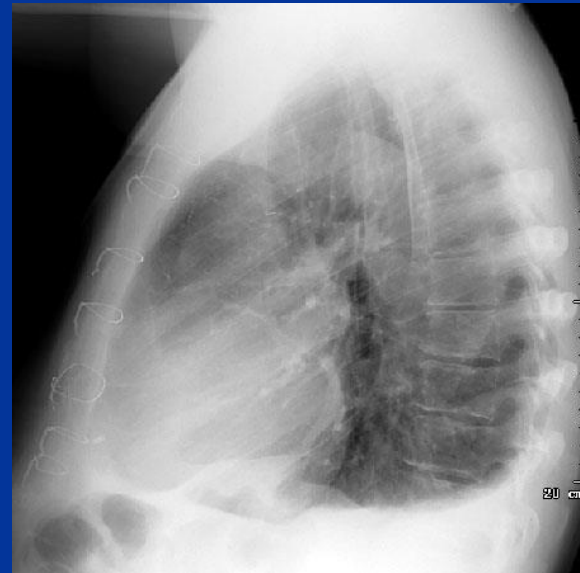
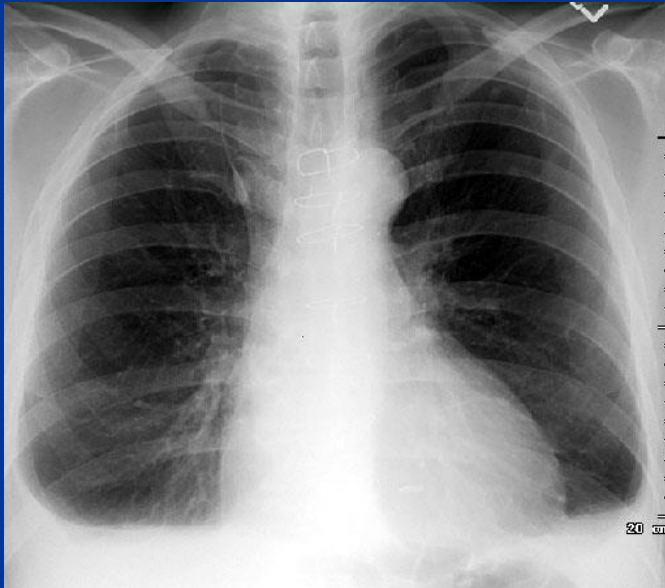
# PLEURAL EFFUSION



# COMPARE COSTO-PHRENIC ANGLES

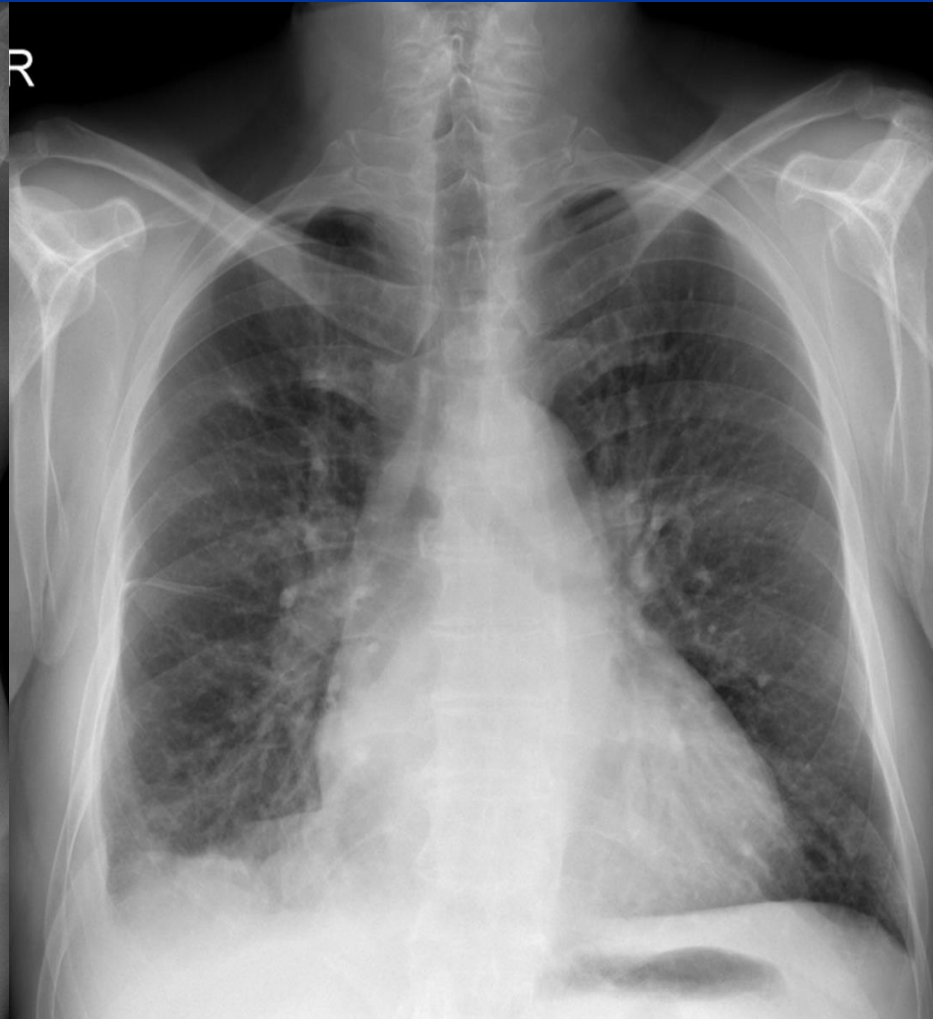
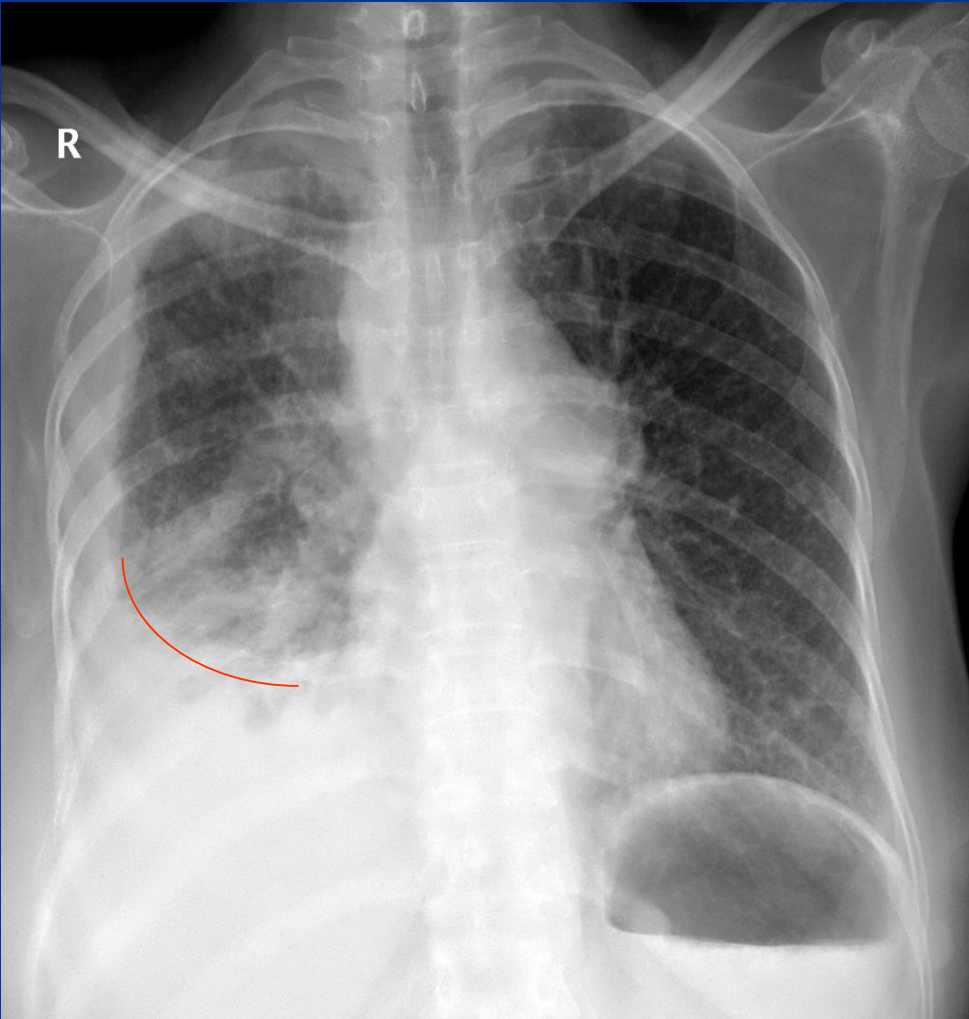


# PLEURAL EFFUSION

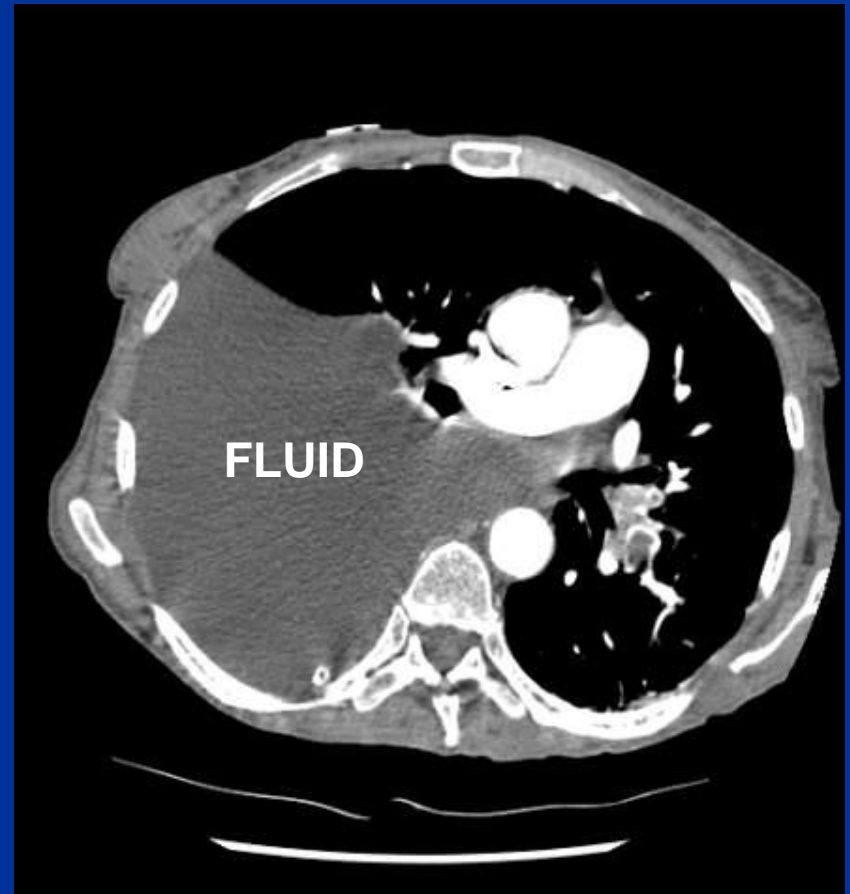
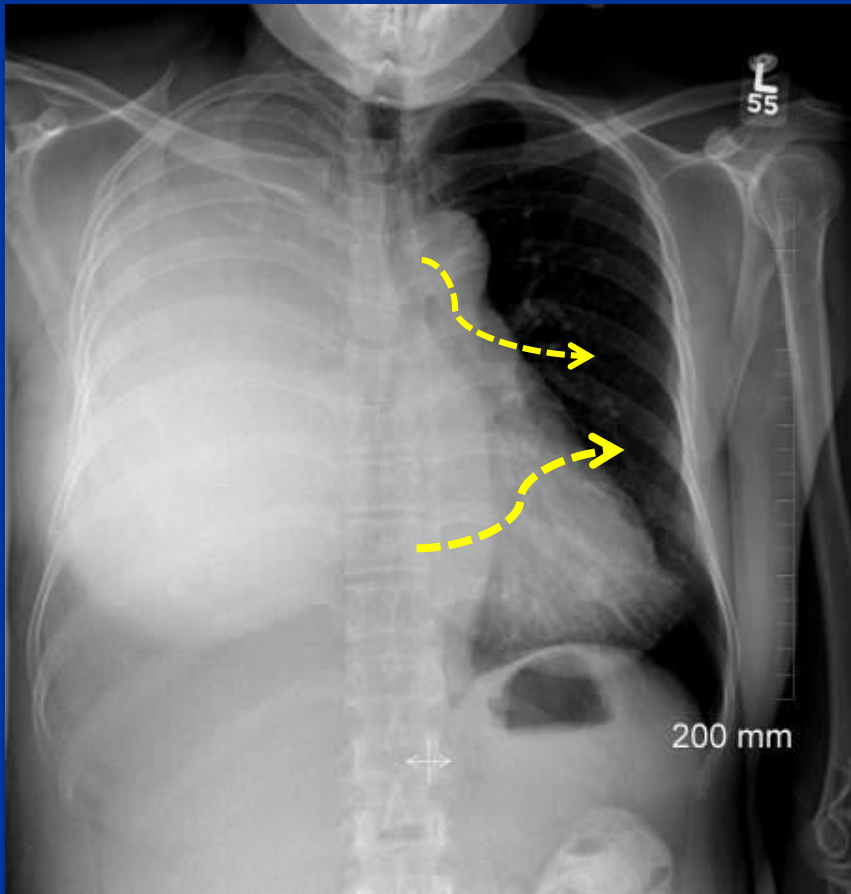


- On an upright film, an effusion will cause blunting on the lateral and if large enough, the posterior costophrenic sulci. Sometimes a depression of the involved diaphragm will occur. A large effusion can lead to a mediastinal shift away from the effusion and opacity the hemithorax. Approximately **200 ml** of fluid are needed to detect an effusion in the **frontal film** vs. approximately **75ml** for the **lateral**. Larger effusions, especially if unilateral, are more likely to be caused by malignancy than smaller ones.

# PLEURAL EFFUSION

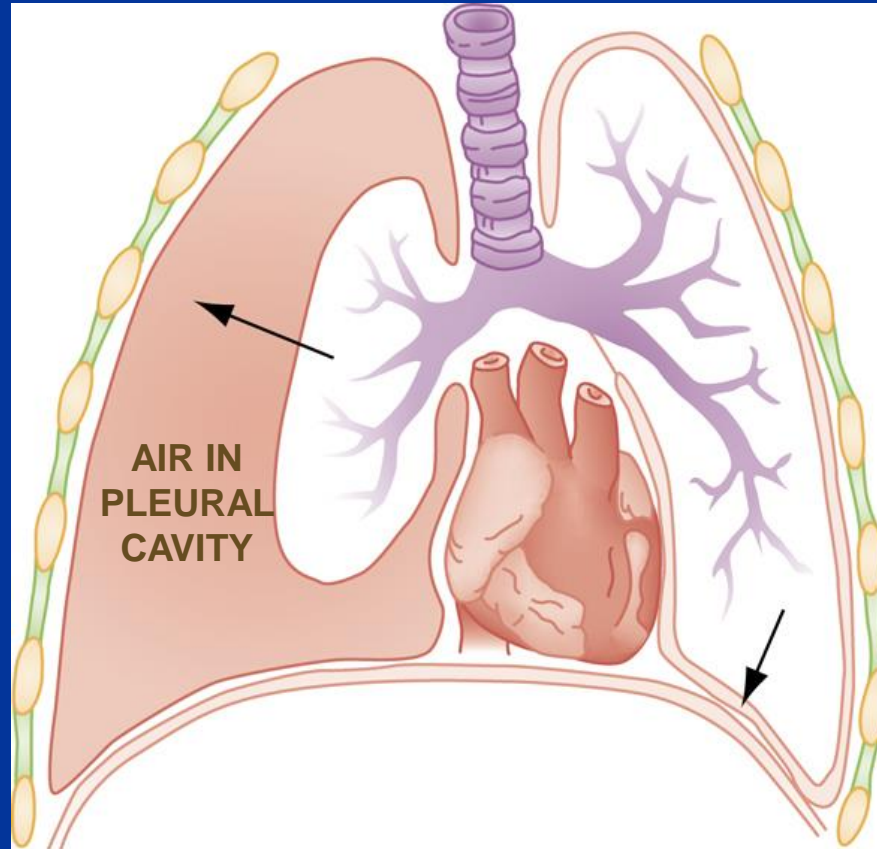


# SEVER PLEURAL EFFUSION

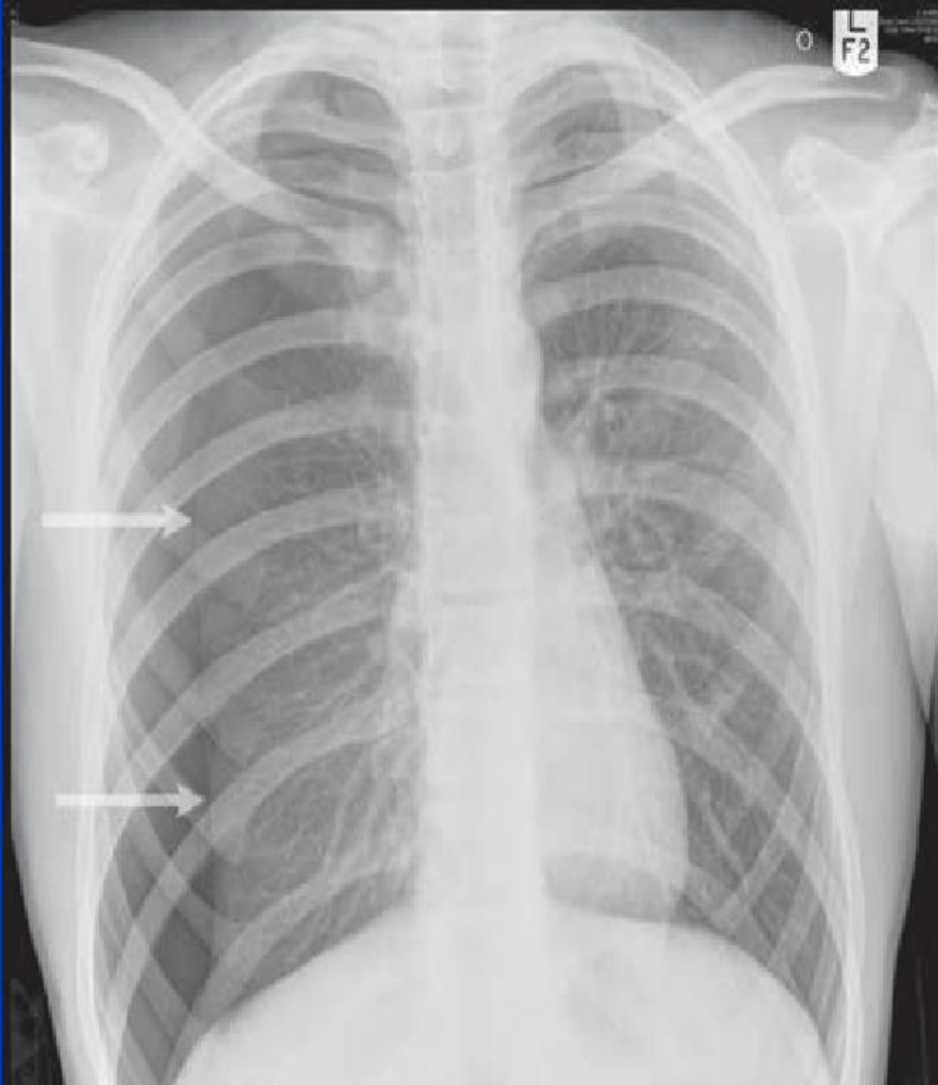




# PNEUMOTHORAX

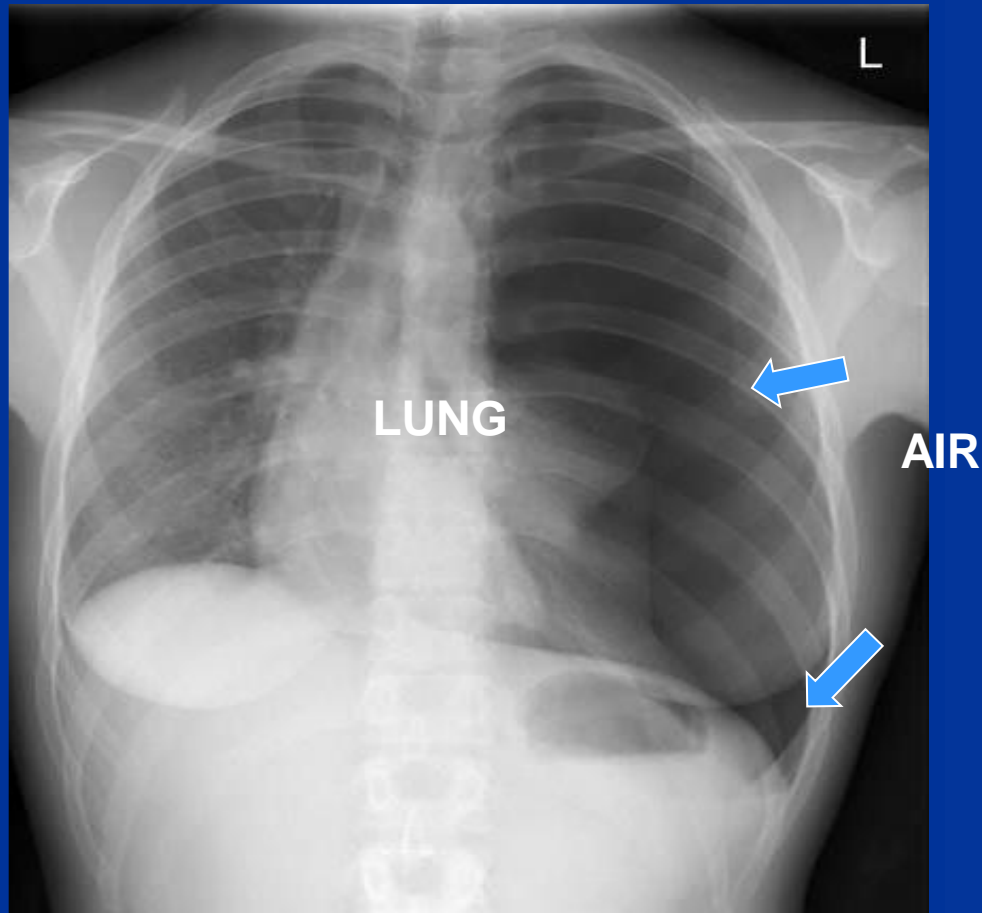


# PNEUMOTHORAX



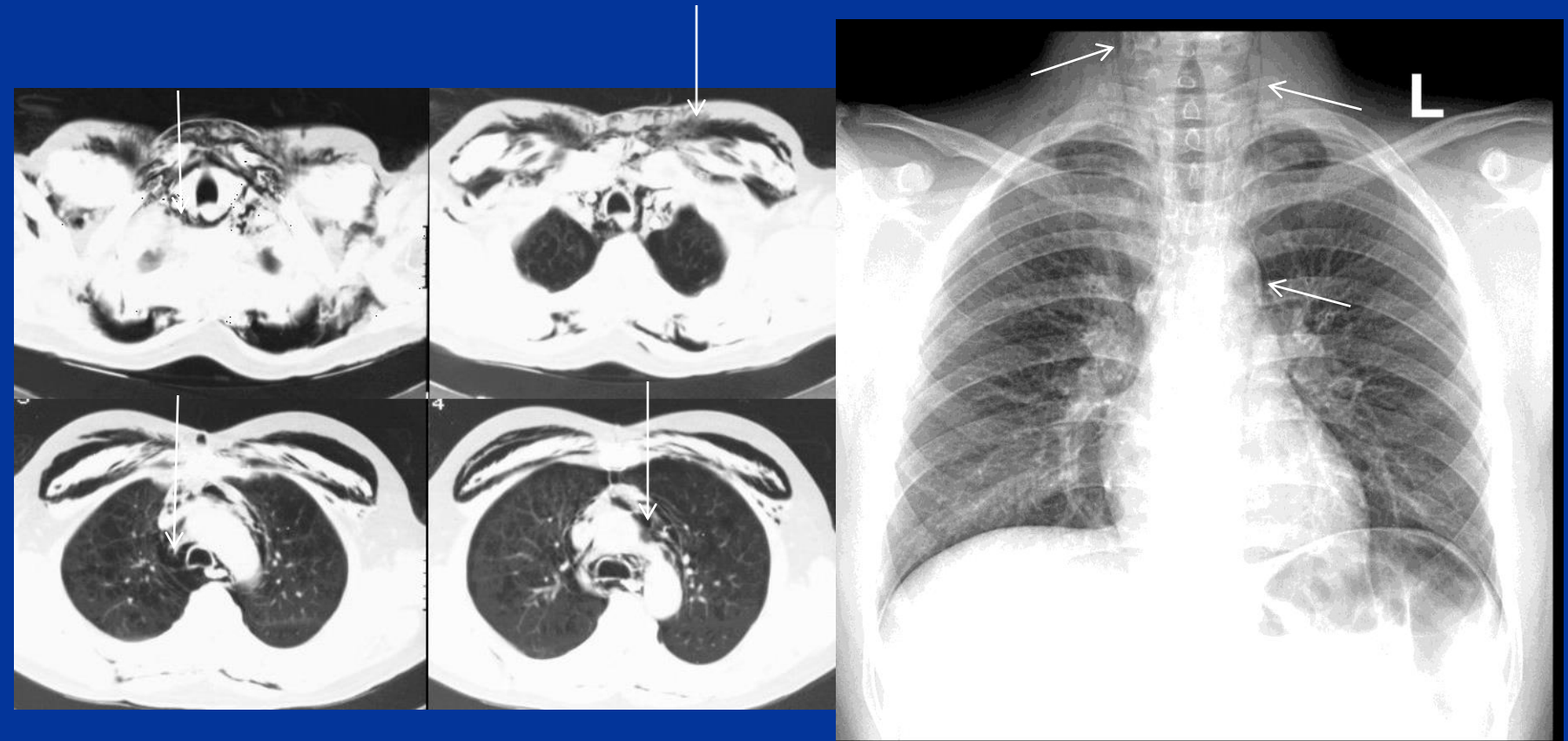
**A pneumothorax is defined as air inside the thoracic cavity but outside the lung. A spontaneous pneumothorax is one that occurs without an obvious inciting incident.**

# TENSION PNEUMOTHORAX

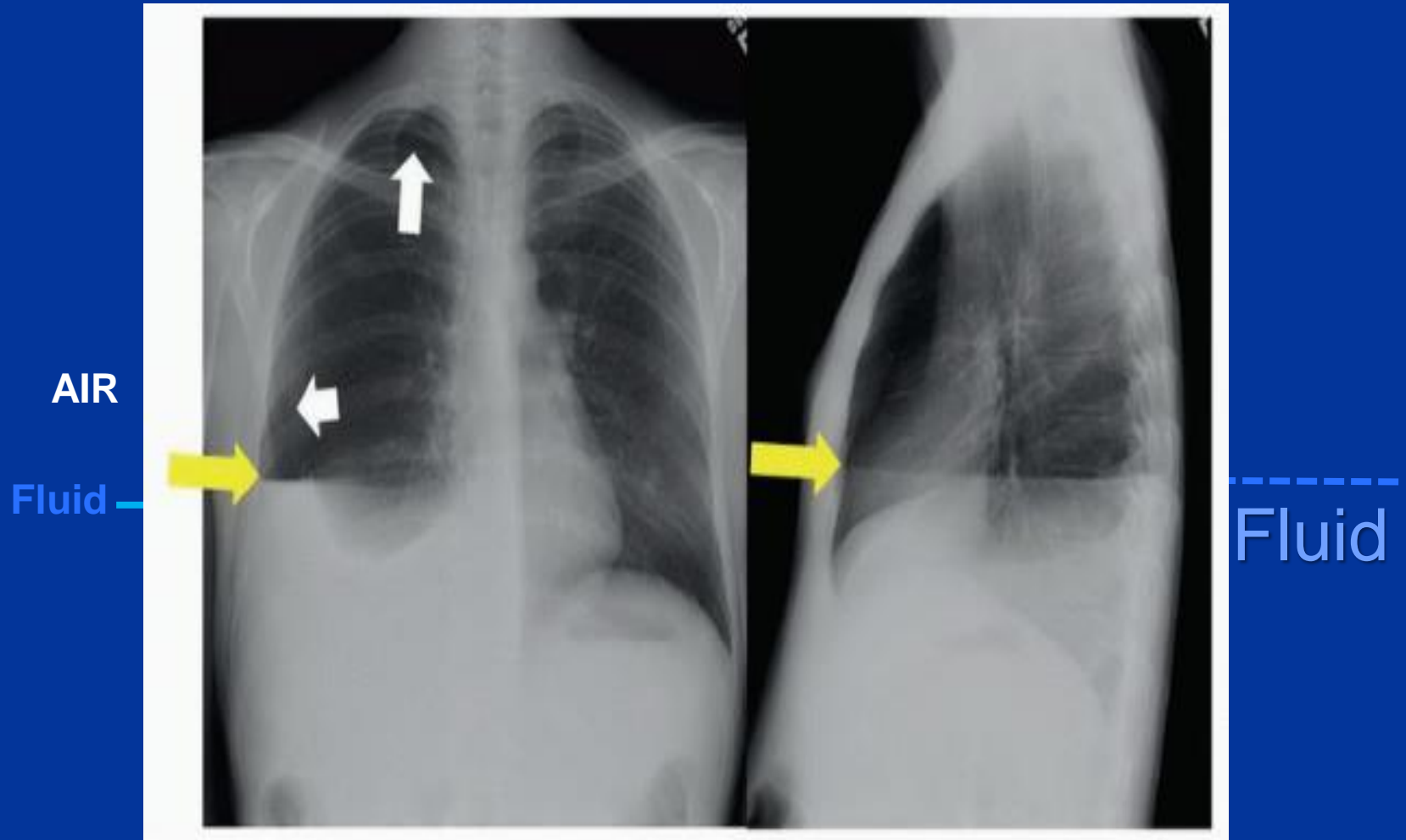


**Cardiomedastinal shift toward contralateral side**

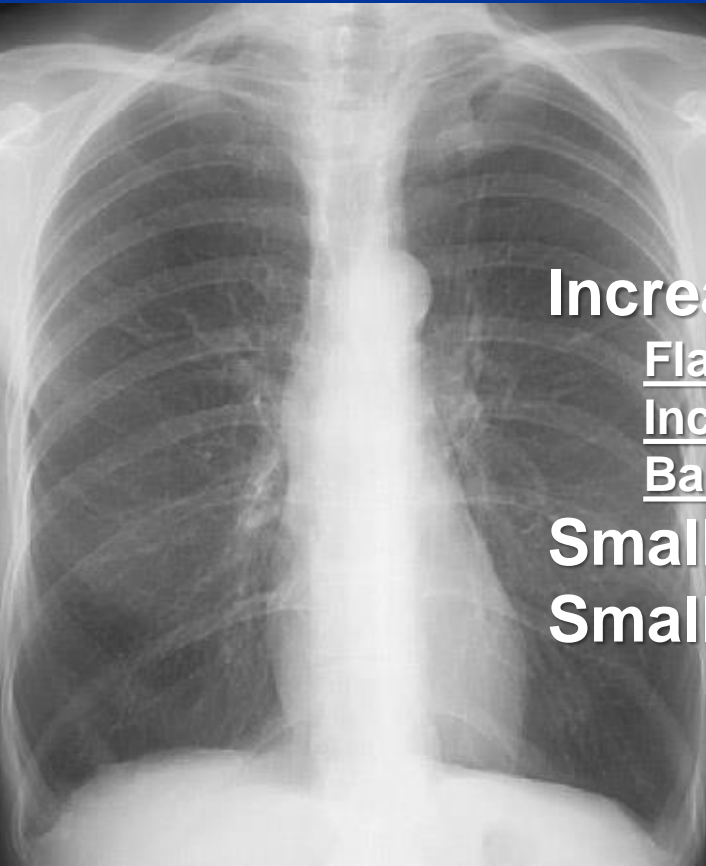
# PNEUMOMEDIASTINUM



# Hydro-pneumo-thorax



# EMPHYSEMA



**Increased Lung Volume**

Flattened Diaphragms

Increase in Retrosternal Airspace

Barrel chest

**Small Vessels**

**Small, narrow cardiac SHADOW**



- Emphysema is **loss of elastic recoil of the lung** with destruction of pulmonary capillary bed and alveolar septa. It is caused most often by cigarette smoking and less commonly by alpha-1 antitrypsin deficiency.



**EMPHYSEMA**



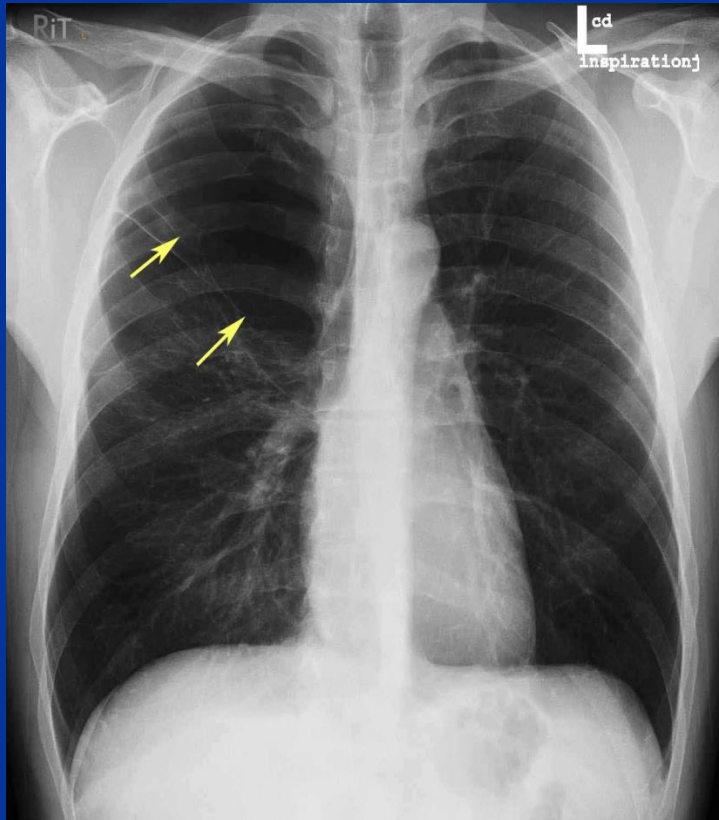
- Emphysema is commonly seen on CXR as diffuse hyperinflation with flattening of diaphragms, increased retrosternal space, bullae (lucent, air-containing spaces that have no vessels that are not perfused)



**Normal**



# Giant Bulla

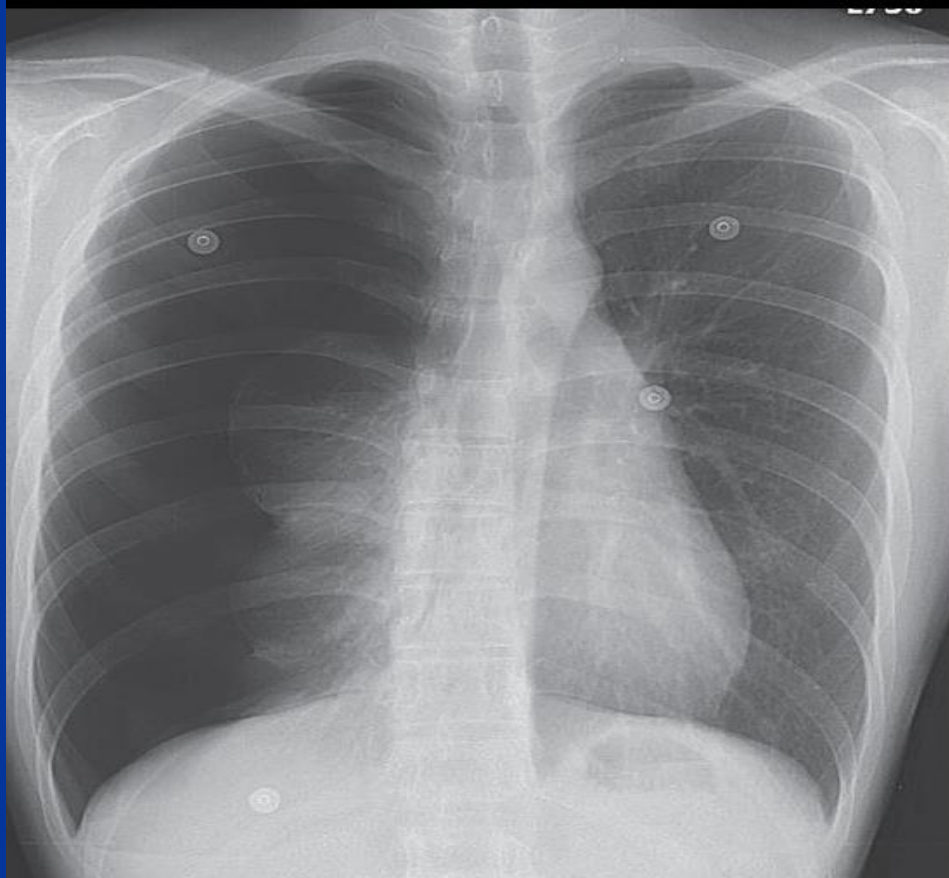




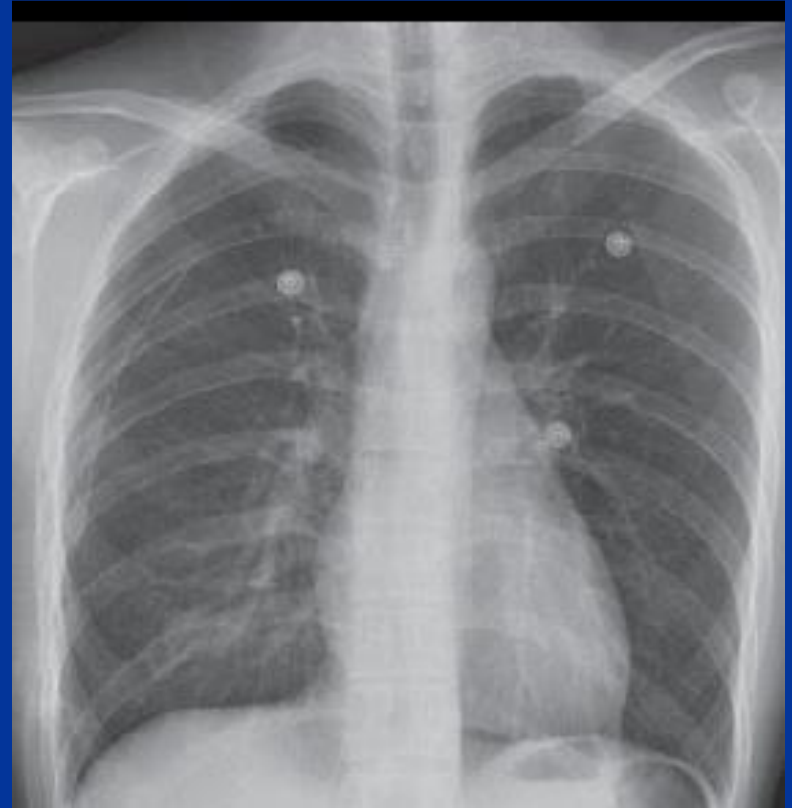
# CASES

## History

▶ 27-year-old woman with chest tightness and shortness of breath presents to the Emergency Department.



# Case 1 Tension Pneumothorax

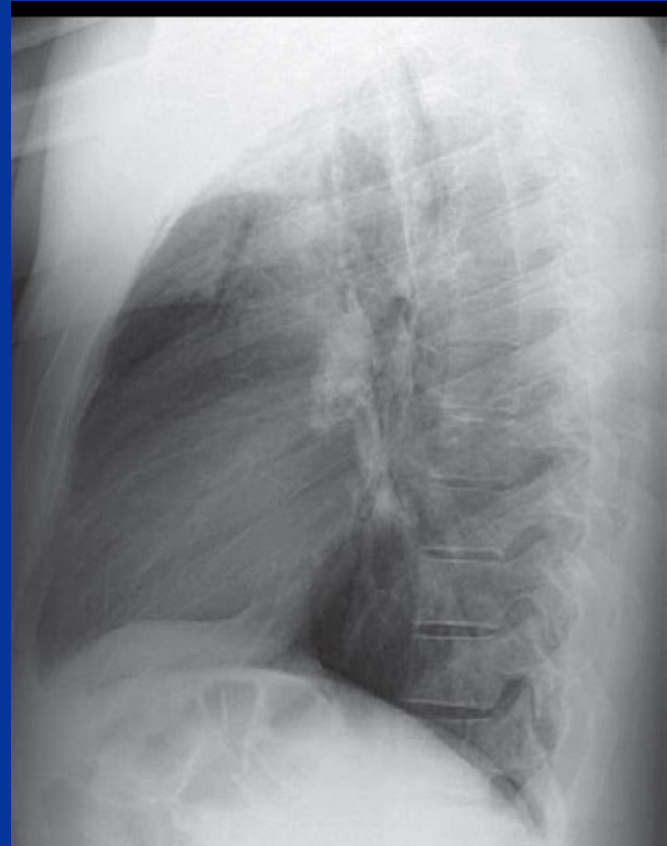


## Findings

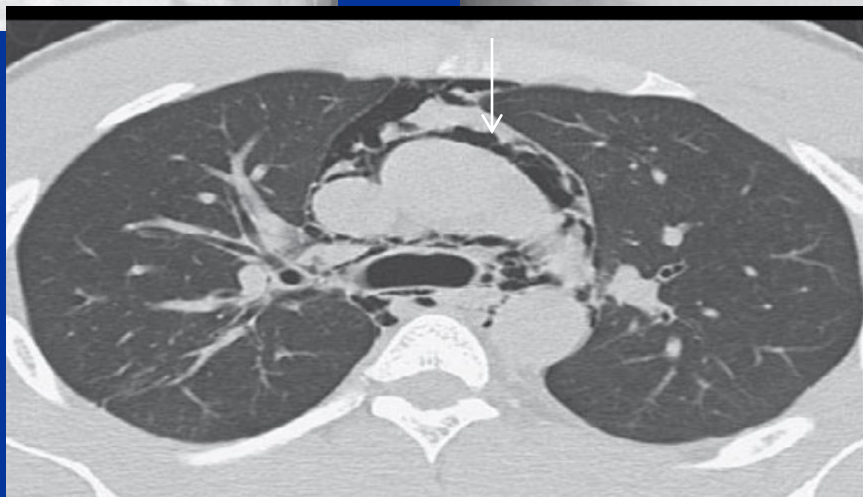
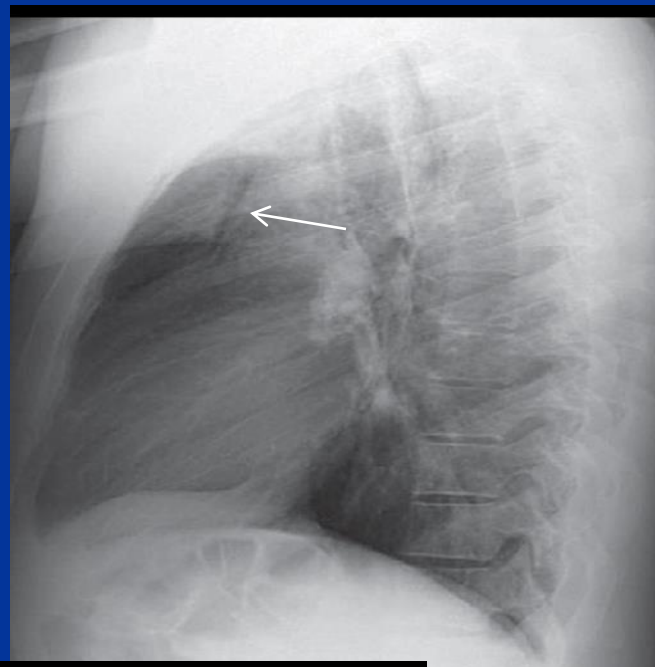
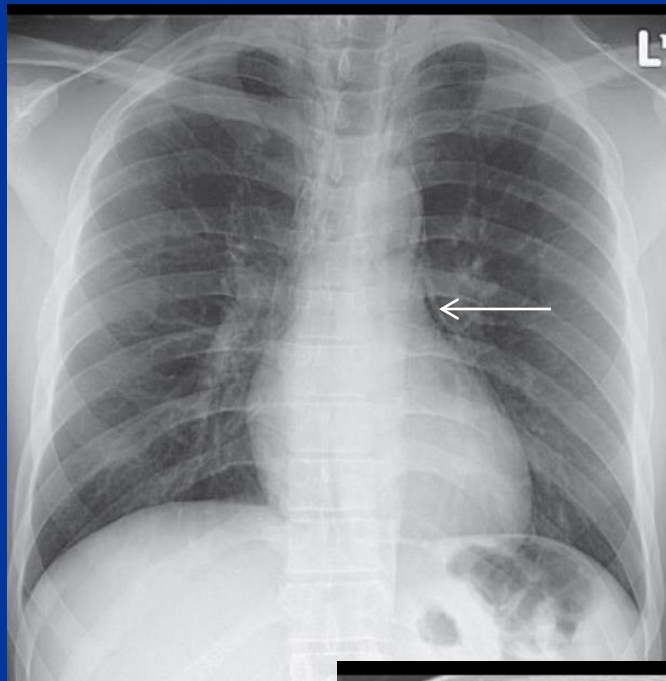
- ▶ Initial chest radiograph (Fig. 1.1 ) clearly demonstrates increased lucency in the right hemothorax with minimal displacement of the right hemidiaphragm inferiorly and shift of the mediastinum left ward. Note the increased distances between the ribs on the right, compared with those on the left . The right lung is partially collapsed.
- ▶ Visceral pleural surface (white arrows in Fig. 1 .2 ) can be seen as a thin white line, allowing distinction from a skin fold. No pulmonary vessels are seen lateral to the pleural line. The anterior junction line (black arrow in Fig. 1.2 ) is also displaced left ward.

## History

- ▶ 22-year-old man complains of severe sudden onset of chest pain.



# Case 2 Spontaneous Pneumomediastinum



## **Findings**

▶ **Chest radiograph shows lucency adjacent to the left heart border (arrow in Fig. 6.3 ) on the frontal radiograph.**

**Increased lucency is also seen around the aortic arch and in the right paratracheal region.**

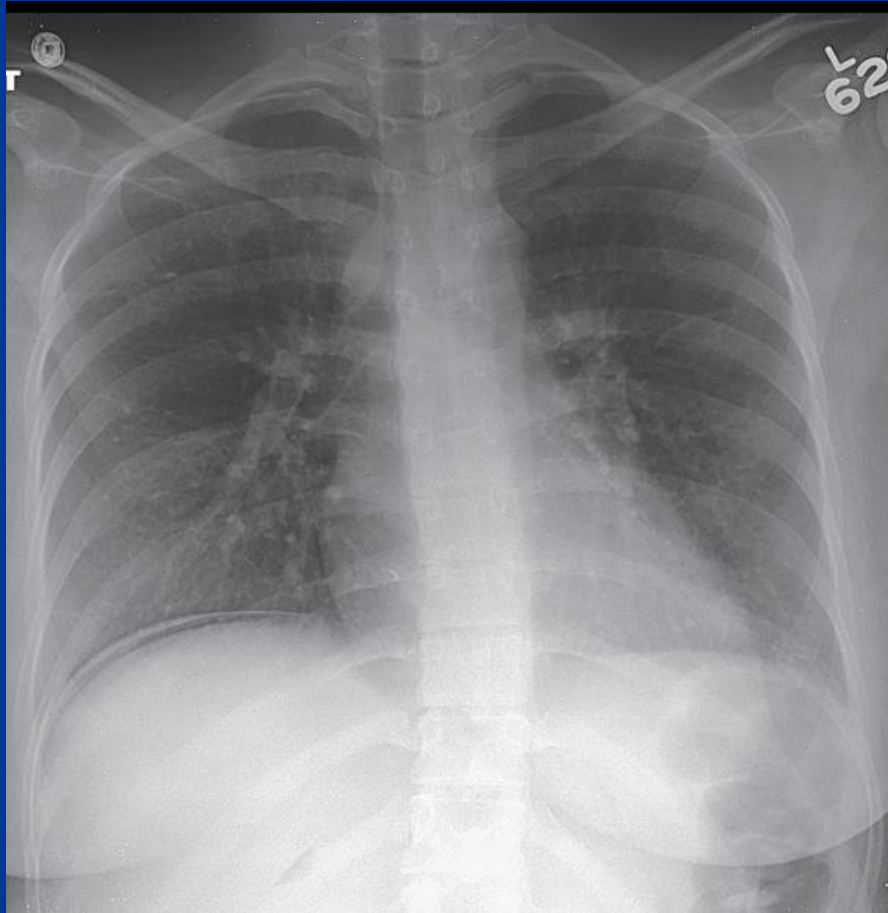
▶ **On the lateral radiograph, the anterior wall of the trachea is very well seen (arrow in Fig. 6.4 ).**

**Gas is also seen anterior to the ascending aorta.**

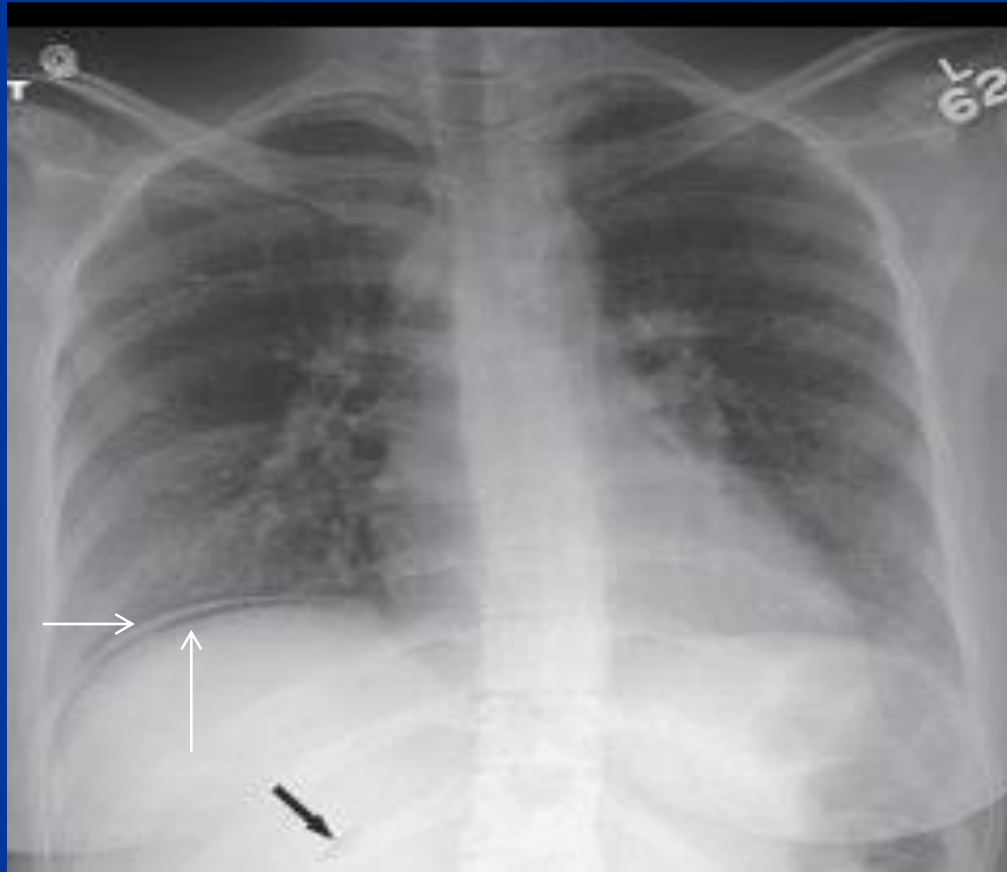
▶ **CT (Fig. 6.5 ) confirms the presence of gas centrally without fluid or evidence of tracheal rupture.**

## History

- ▶ 26-year-old woman presents with sudden onset of chest and shoulder pain.



# Case 3 :Pneumoperitoneum (from a Perforated Ulcer)



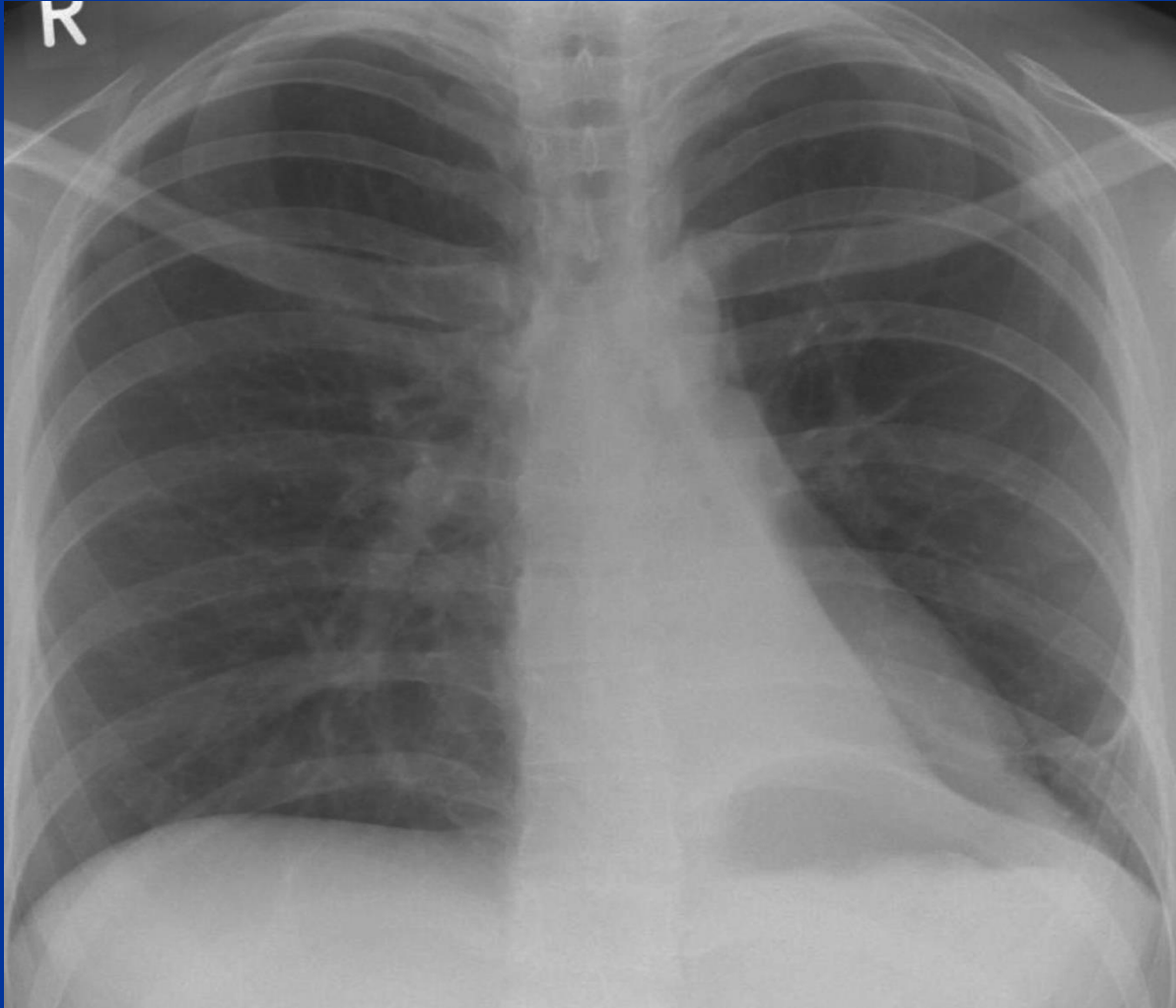


## Findings

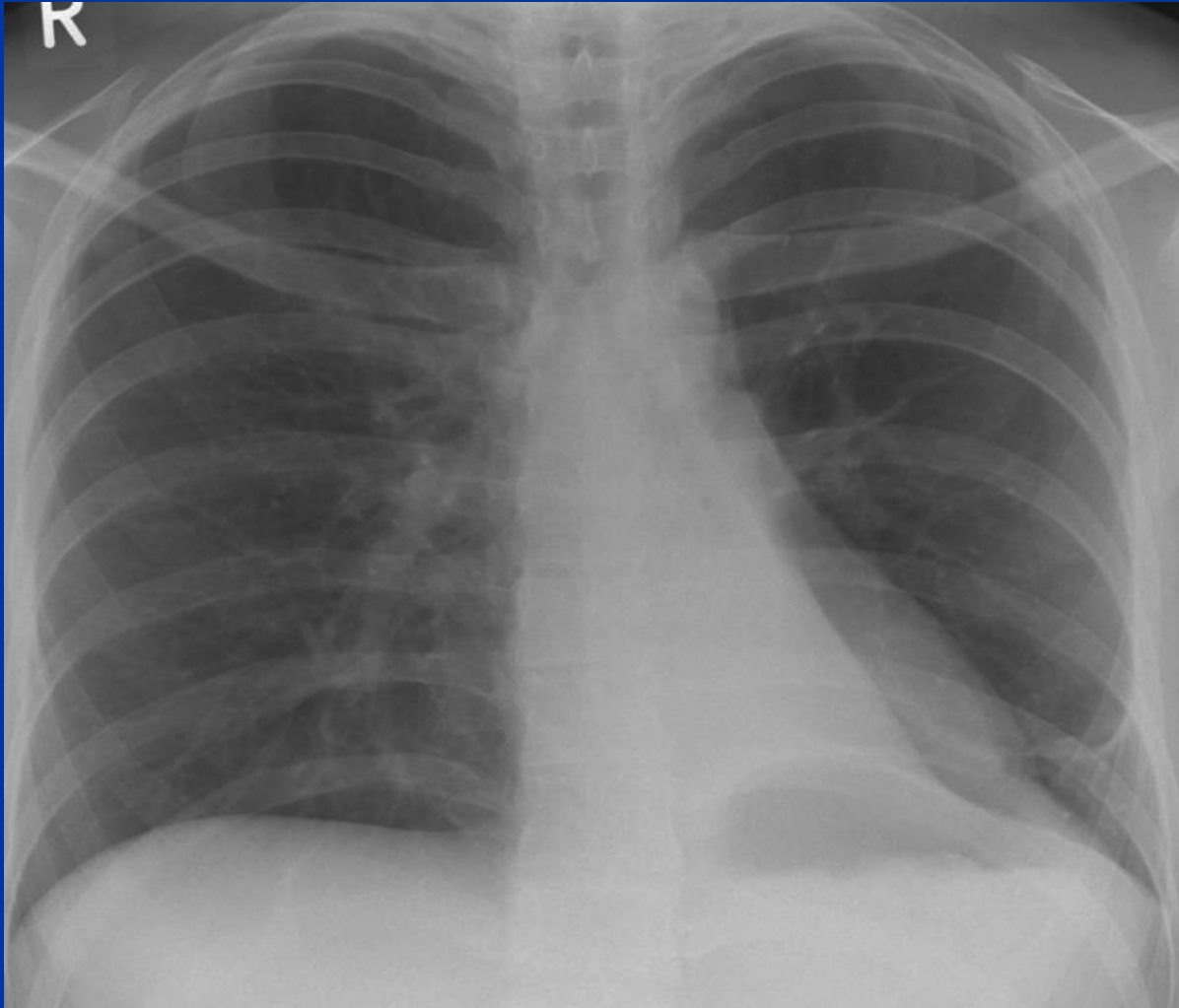
▶ Chest radiograph shows a crescentic lucency below the right hemidiaphragm (Fig. 7.1 ).

## History

- ▶ 28-year-old man with a history of myasthenia gravis is noted to be hypoxic.



## Case 4 Left Lower Collapse (from a Mucus Plug)



## Findings

▶ Initial chest radiograph shows a retrocardiac opacity. The left hemidiaphragm cannot be seen behind the heart and the left heart border appears straightened. Also note the inferior location of the left hilum.



**THANK YOU**