Basic Chest X-Ray Interpretation

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X-rays- describe radiation which is part of the spectrum which includes visible light, gamma rays and cosmic radiation.

Unlike visible light, radiation passes through stuff.

When you shine a beam of X-Ray at a person and put a film on the other side of them a shadow is produced of the inside of their body.

Different tissues in our body absorb X-rays at different extents:

- Bone- high absorption (white)
- Tissue- somewhere in the middle absorption (grey)
- Air- low absorption (black)

Be systematic

:

1) Check the quality of the film

Film Quality

- First determine is the film a PA or AP view.

  PA- the x-rays penetrate through the back of the patient on to the film

  AP-the x-rays penetrate through the front of the patient on to the film.

  All x-rays in the PICU are portable and are AP view

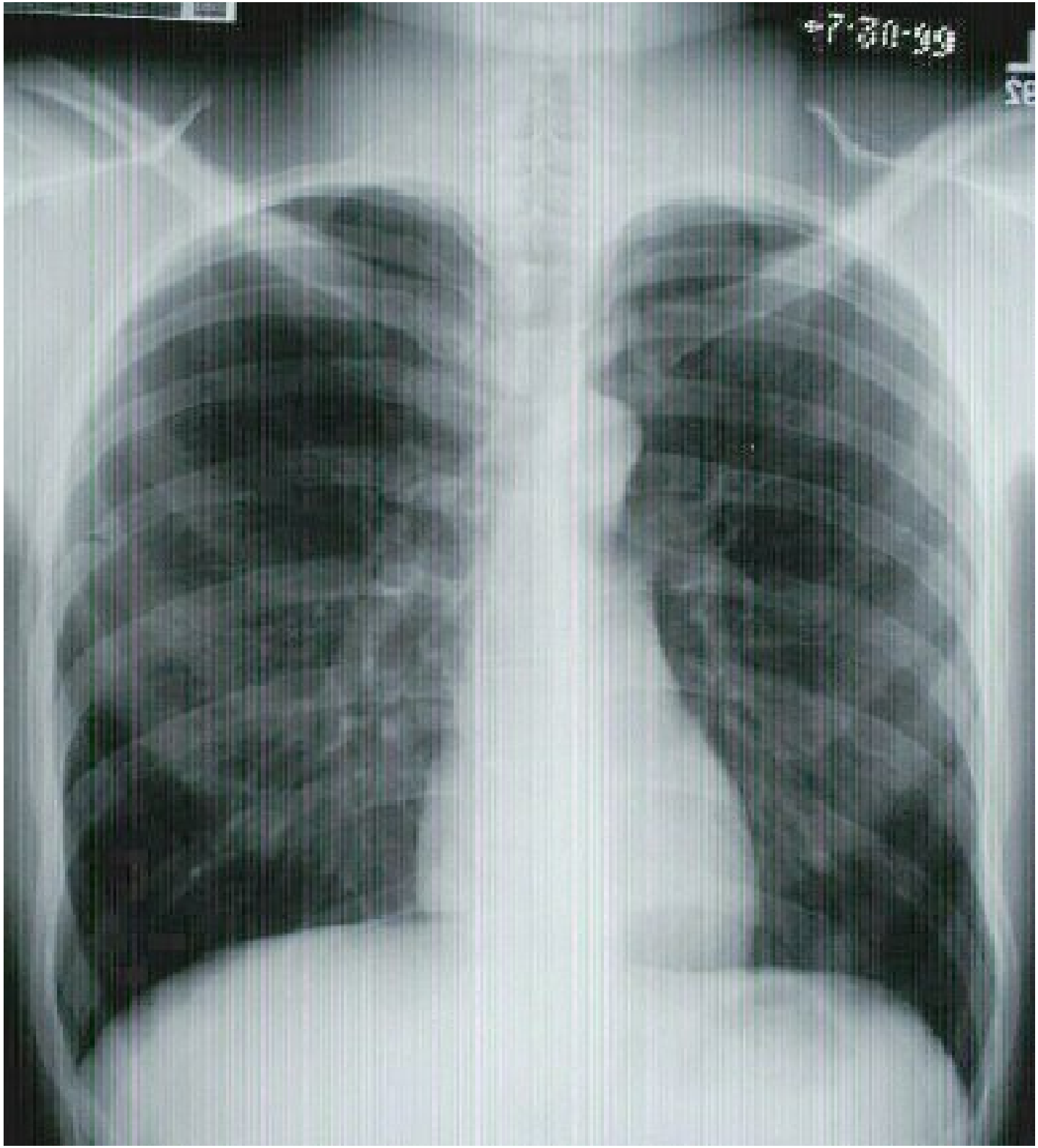
Film Quality (cont)

- Was film taken under full inspiration?
  -10 posterior ribs should be visible.

Why do I say posterior here?

When X-ray beams pass through the anterior chest on to the film Under the patient, the ribs closer to the film (posterior) are most apparent.

A really good film will show anterior ribs too, there should Be 6 to qualify as a good inspiratory film.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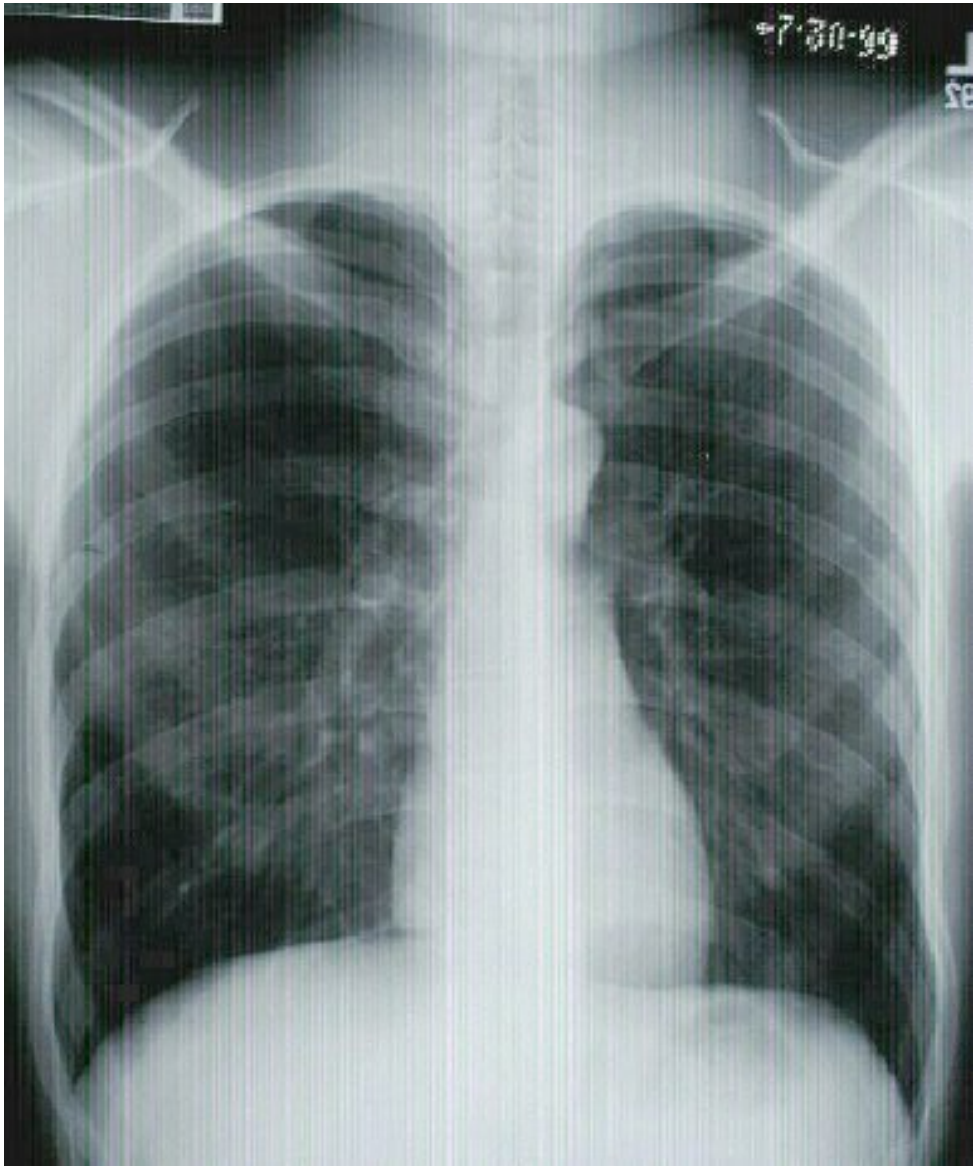
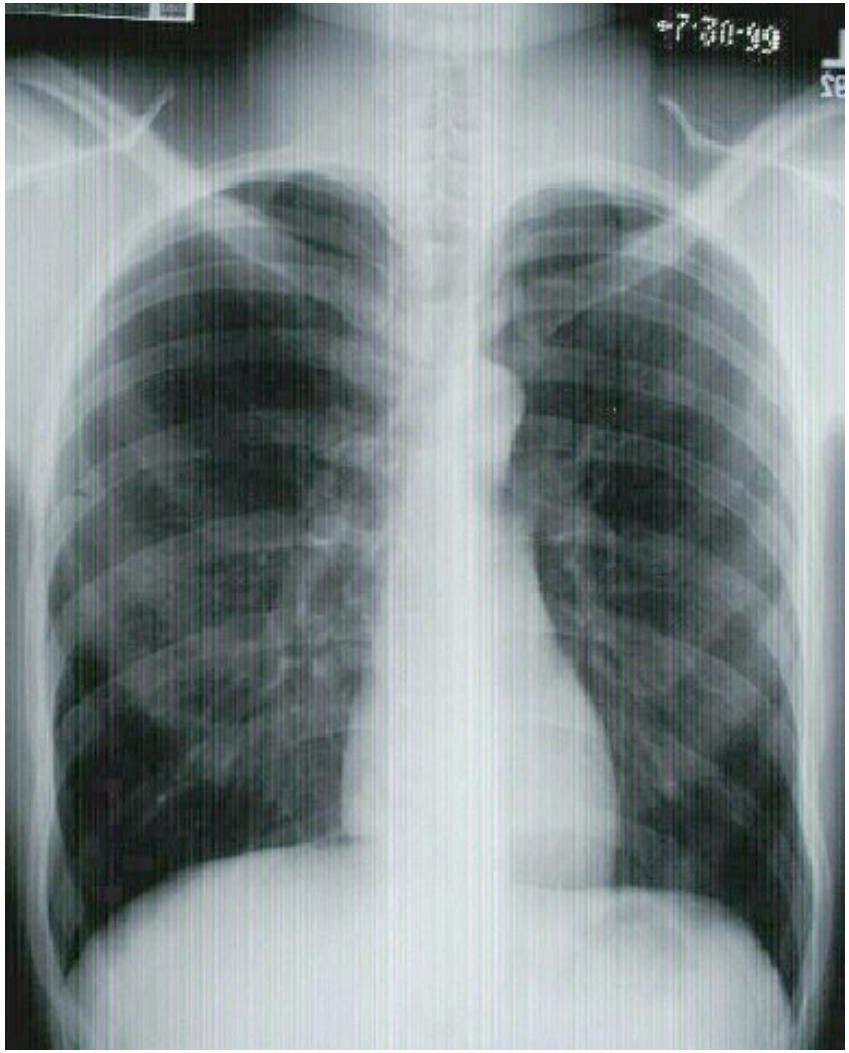
Quality (cont.)

- Is the film over or under penetrated if under penetrated you will not be able to see the thoracic vertebrae.



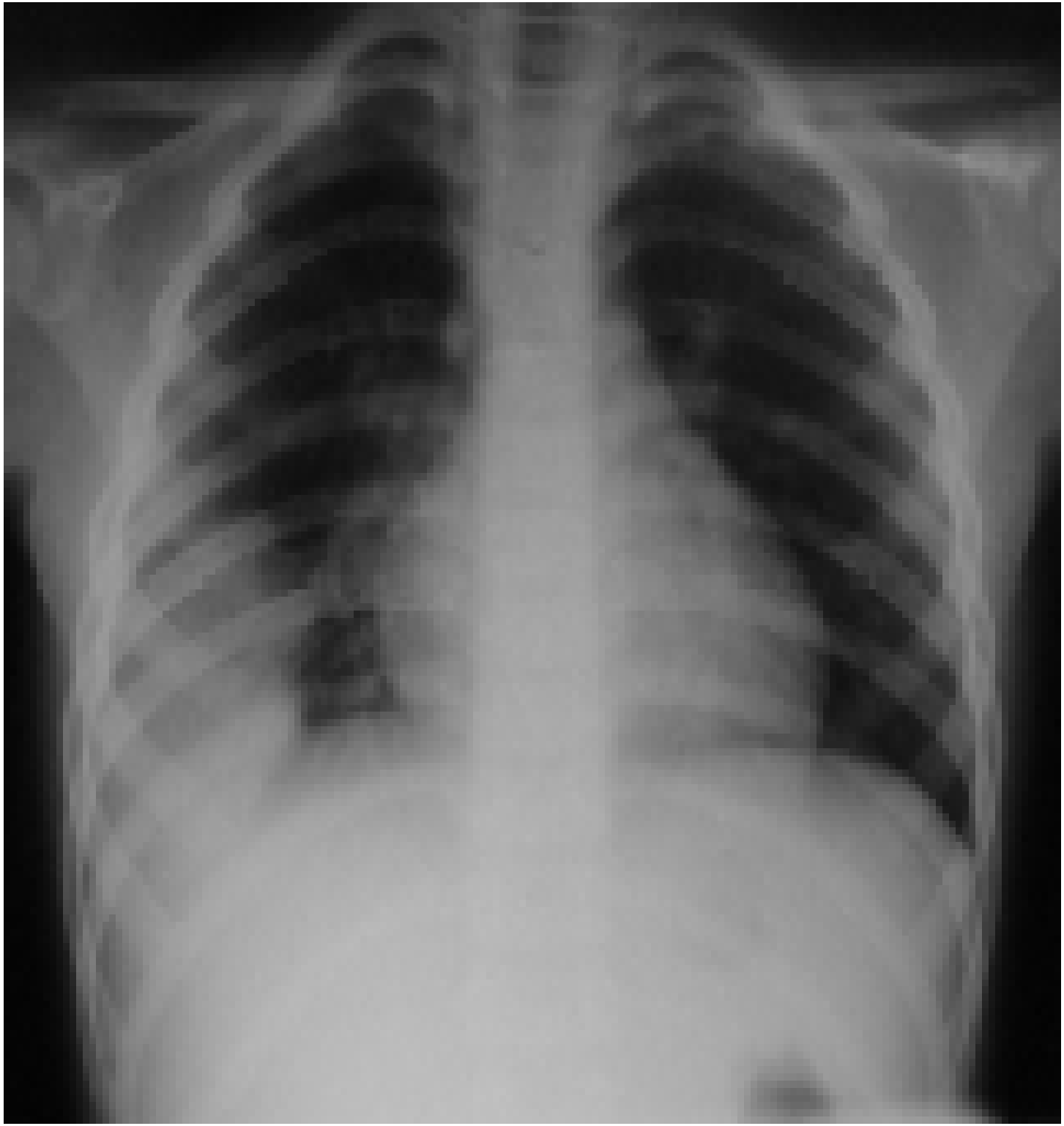
Quality (cont)

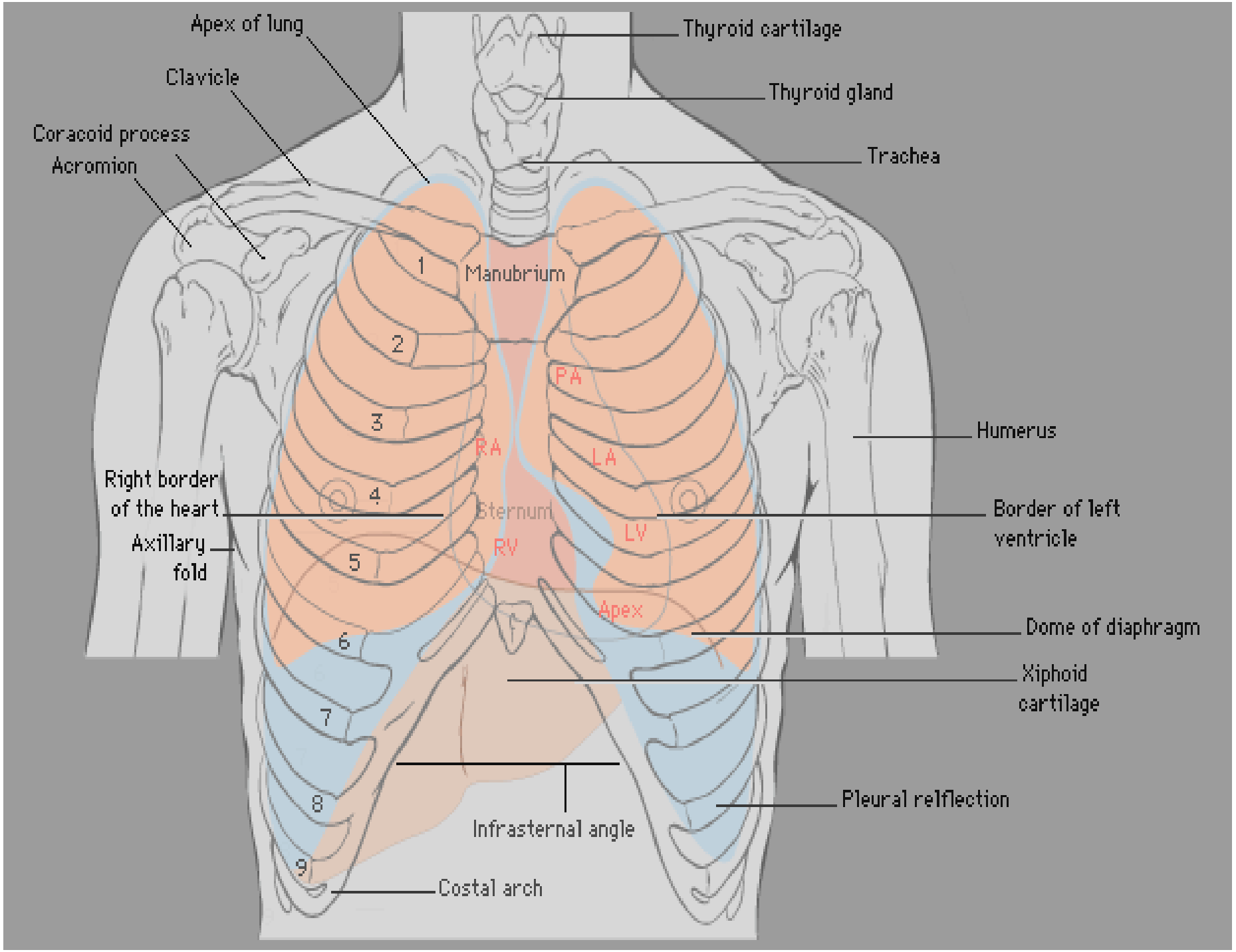
- Check for rotation
  - Does the thoracic spine align in the center of the sternum and between the clavicles?
  - Are the clavicles level?



Verify Right and Left sides

- Gastric bubble should be on the left




Apex of lung
Clavicle
Coracoid process
Acromion
Thyroid cartilage
Thyroid gland
Trachea
1
Manubrium
2
PA
3
RA
LA
Humerus
Right border of the heart
4
Sternum
Border of left ventricle
Axillary fold
5
RV
LV
Apex
Dome of diaphragm
6
Xiphoid cartilage
7
Pleural relflection
8
Infrasternal angle
9
Costal arch

Now you are ready

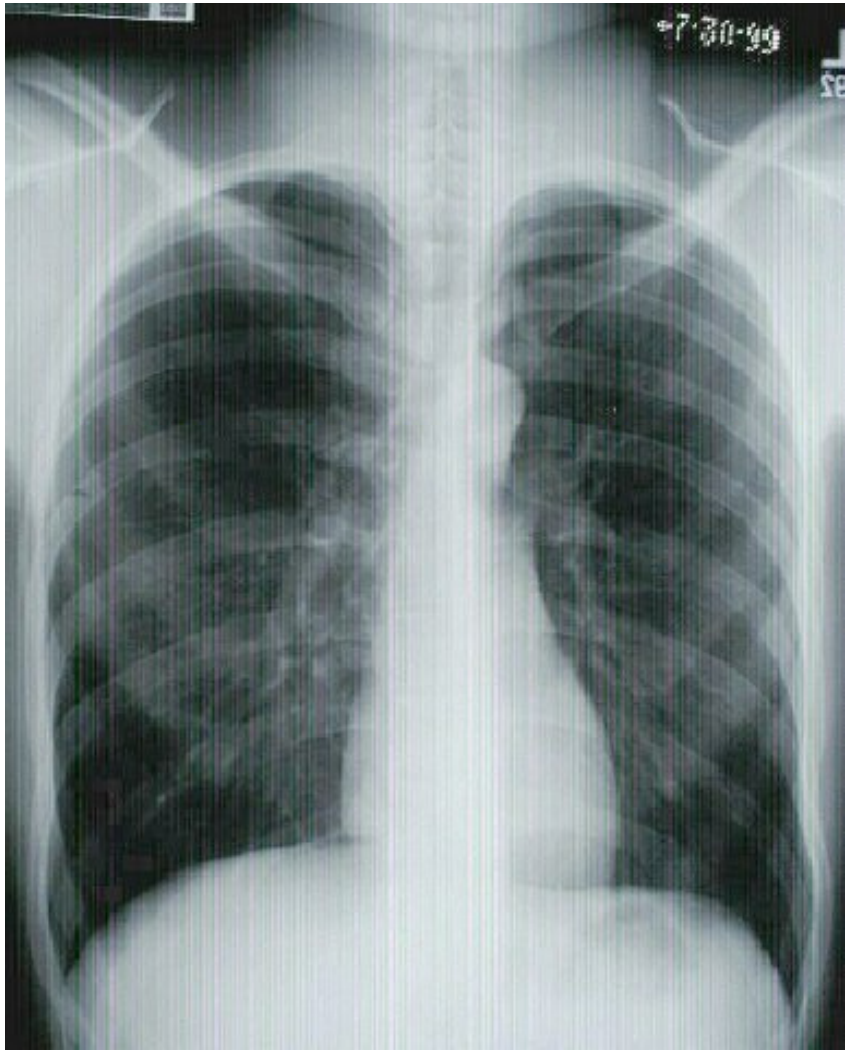
- Look at the diaphram:

  for tenting

  free air

  abnormal elevation
- Margins should be sharp

  (the right hemidiaphram is usually slightly higher than the left)

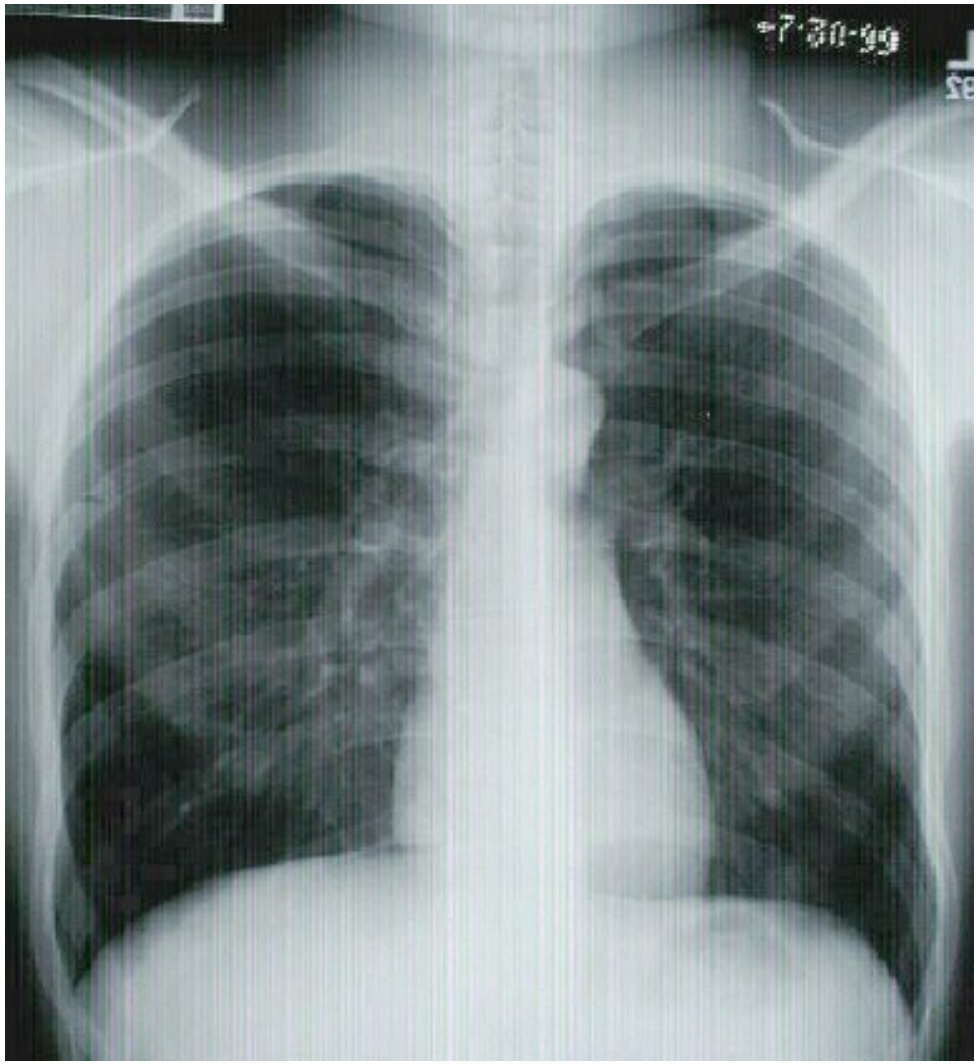


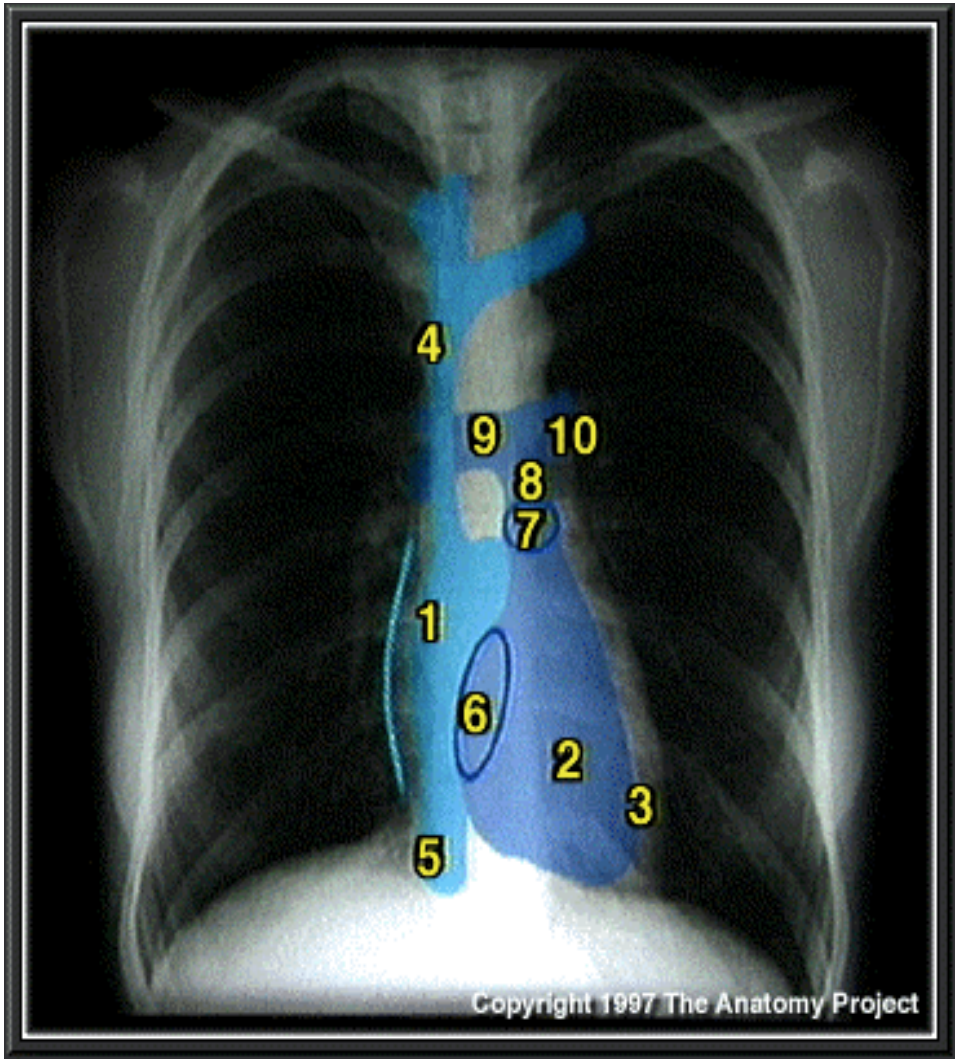
Check the Heart

- Size
- Shape
- Silhouette-margins should be sharp
- Diameter (>1/2 thoracic diameter is enlarged heart)

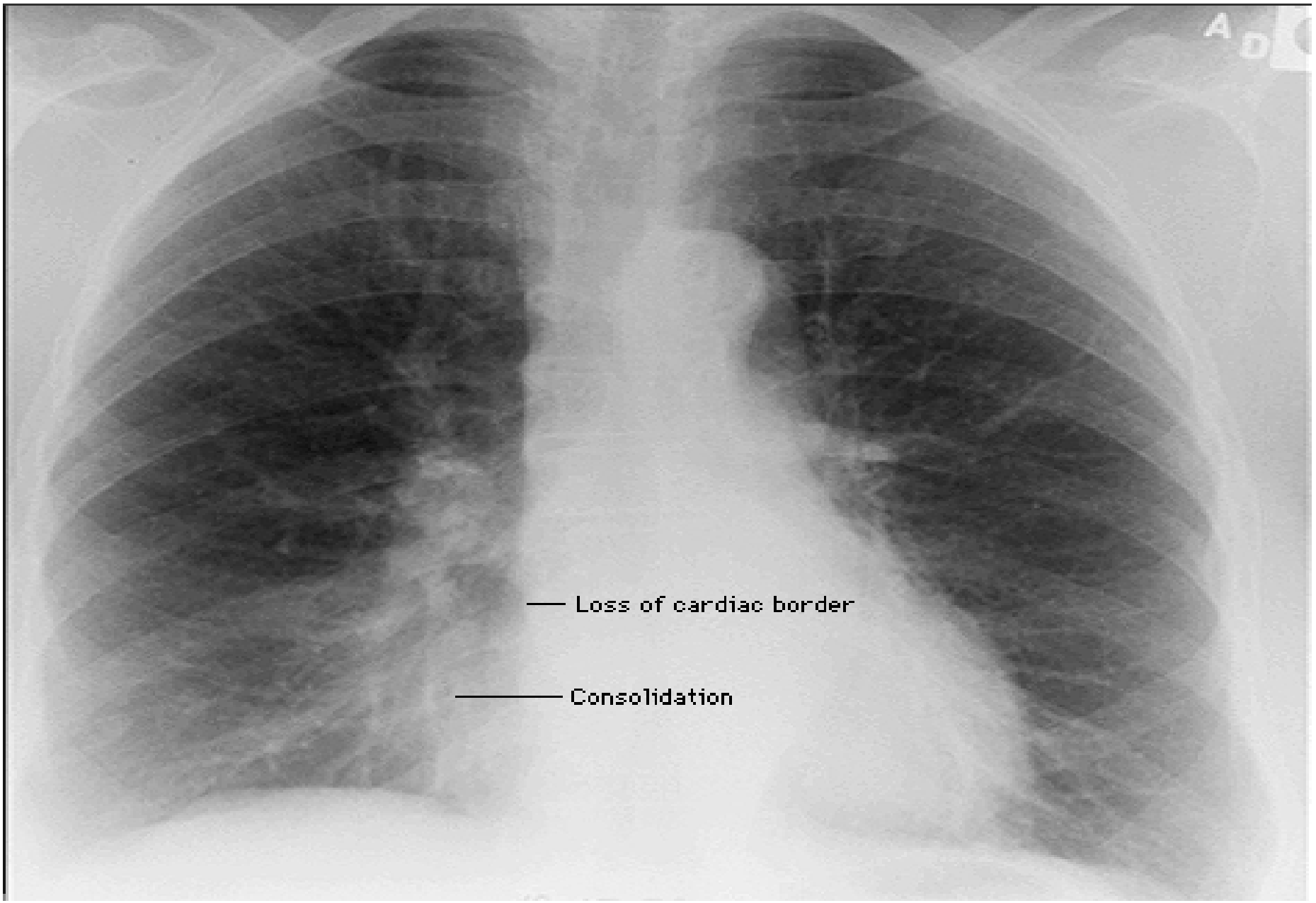
Remember: AP views make heart appear larger than it actually is.

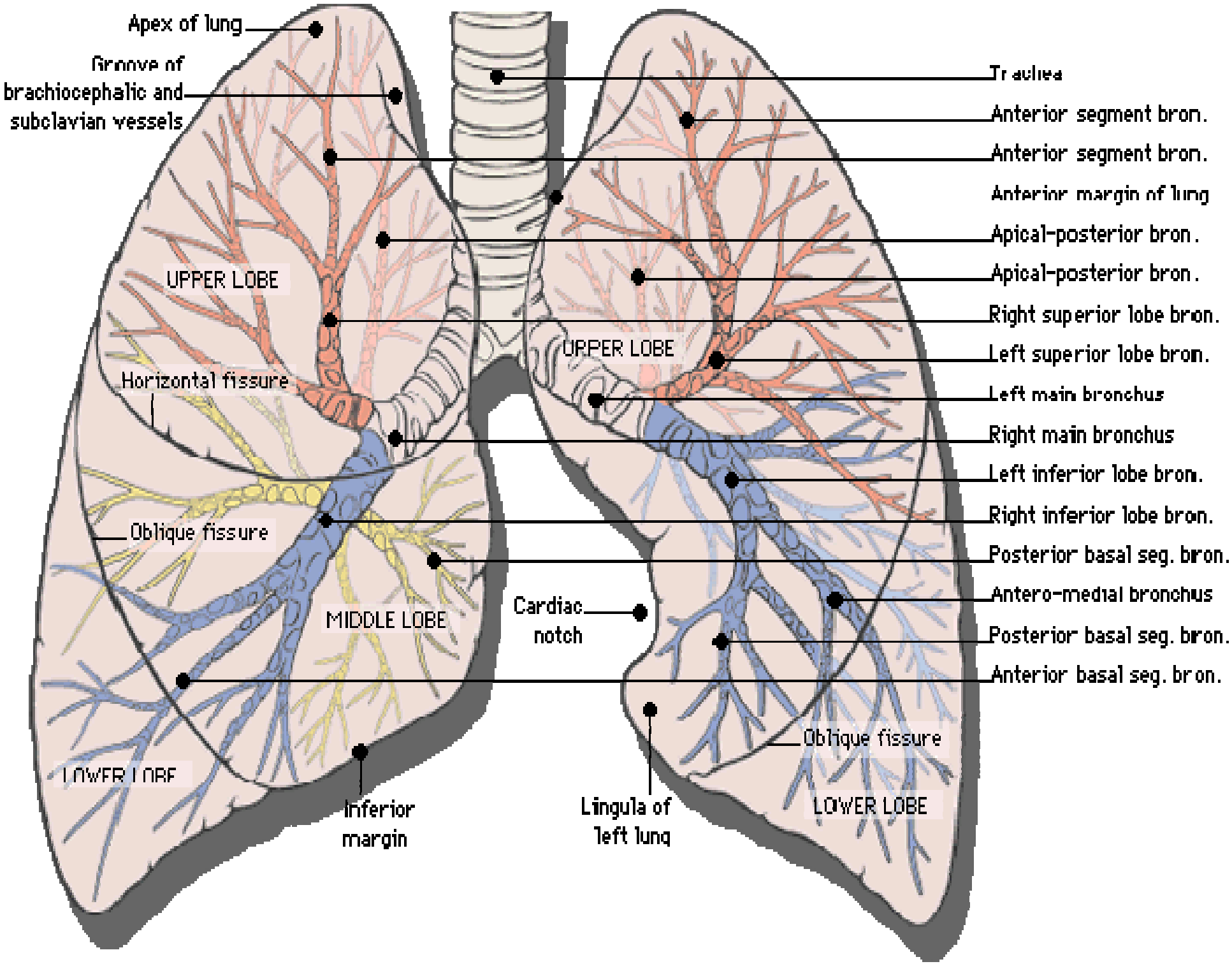
Cardiac Silhouette





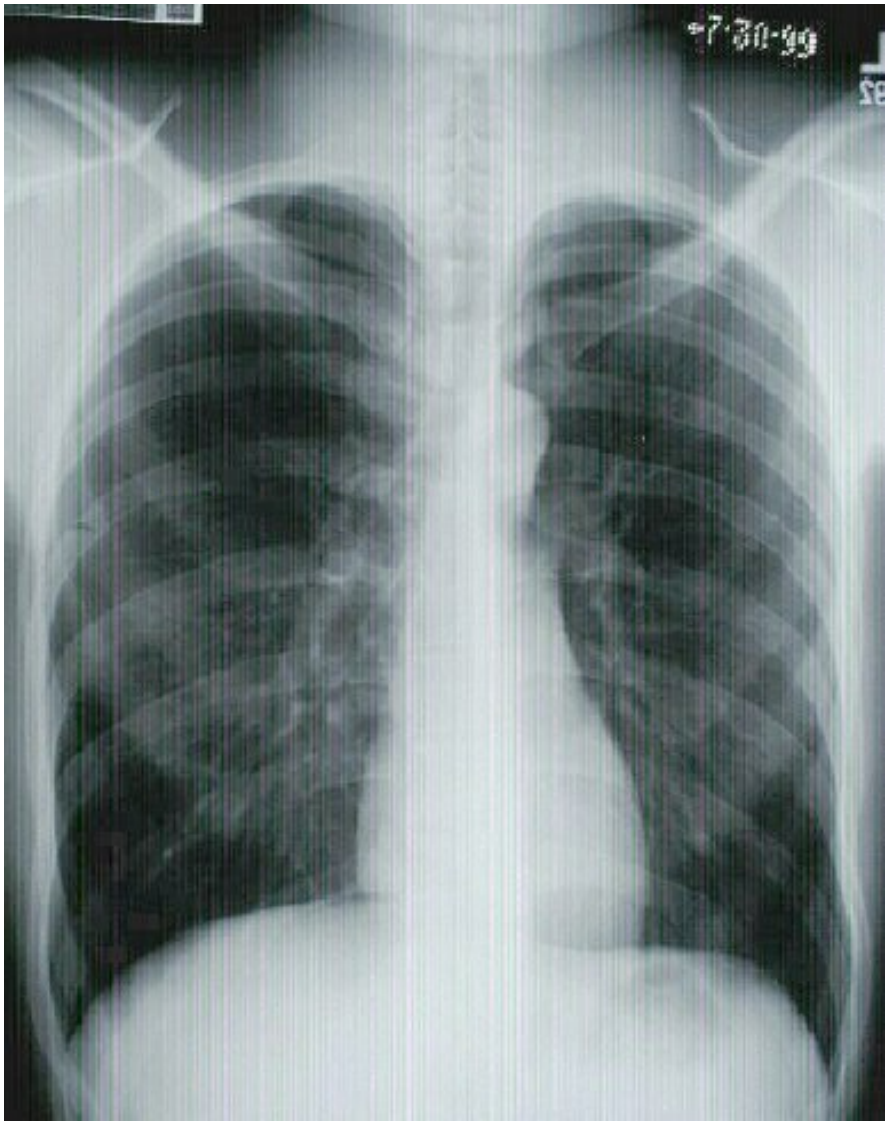
1. R Atrium
2. R Ventricle
3. Apex of L Ventricle
4. Superior Vena Cava
5. Inferior Vena Cava
6. Tricuspid Valve
7. Pulmonary Valve
8. Pulmonary Trunk
9. R PA 10. L PA


Loss of cardiac border
Consolidation

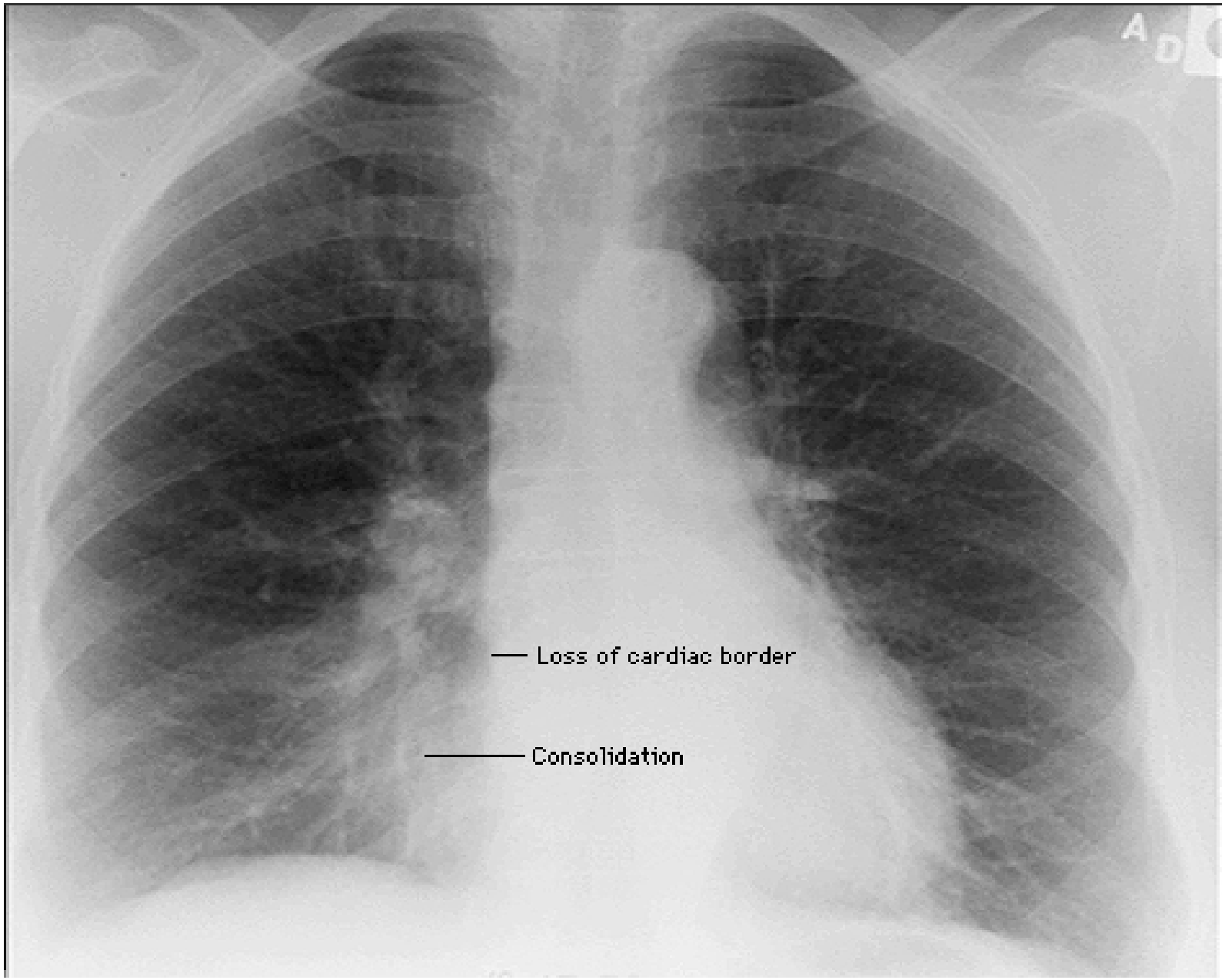

Apex of lung
Groove of brachiocephalic and subclavian vessels
UPPER LOBE
Horizontal fissure
Oblique fissure
MIDDLE LOBE
LOWER LOBE
Inferior margin
Cardiac notch
Lingula of left lung
UPPER LOBE
Oblique fissure
LOWER LOBE
Trachea
Anterior segment bron.
Anterior segment bron.
Anterior margin of lung
Apical-posterior bron.
Apical-posterior bron.
Right superior lobe bron.
Left superior lobe bron.
Left main bronchus
Right main bronchus
Left inferior lobe bron.
Right inferior lobe bron.
Posterior basal seg. bron.
Antero-medial bronchus
Posterior basal seg. bron.
Anterior basal seg. bron.

Check the costophrenic angles

Margins should be sharp

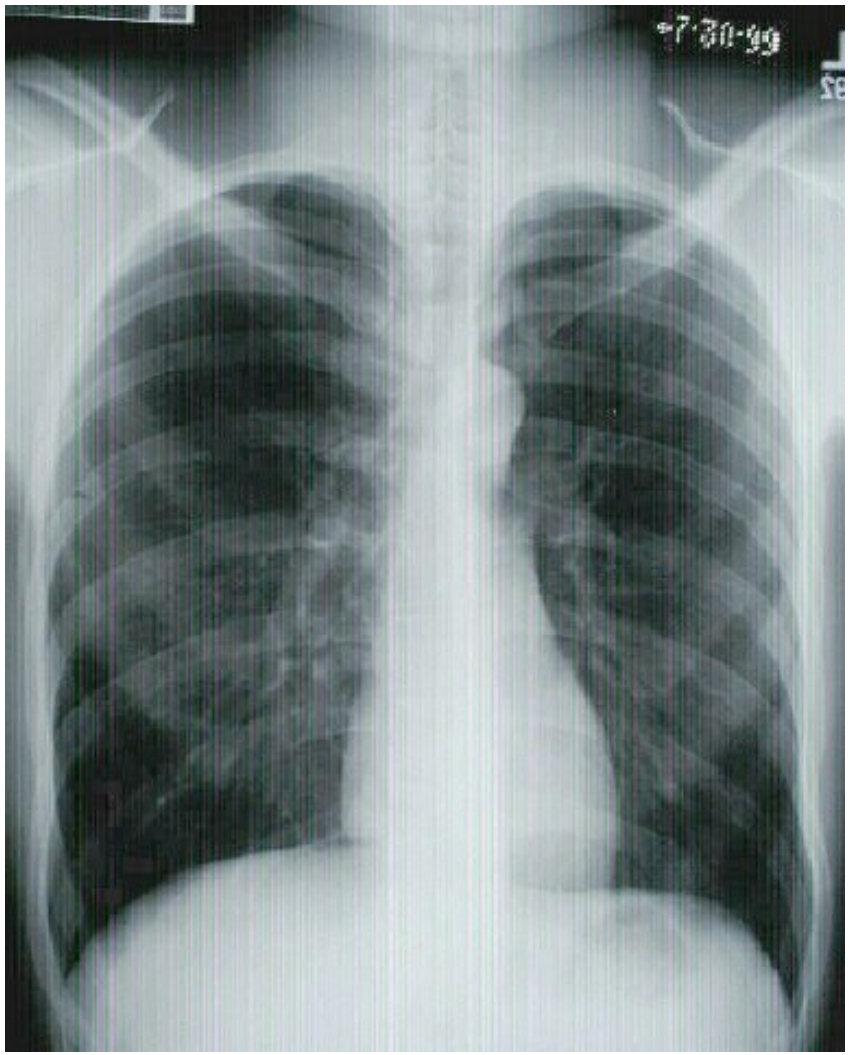


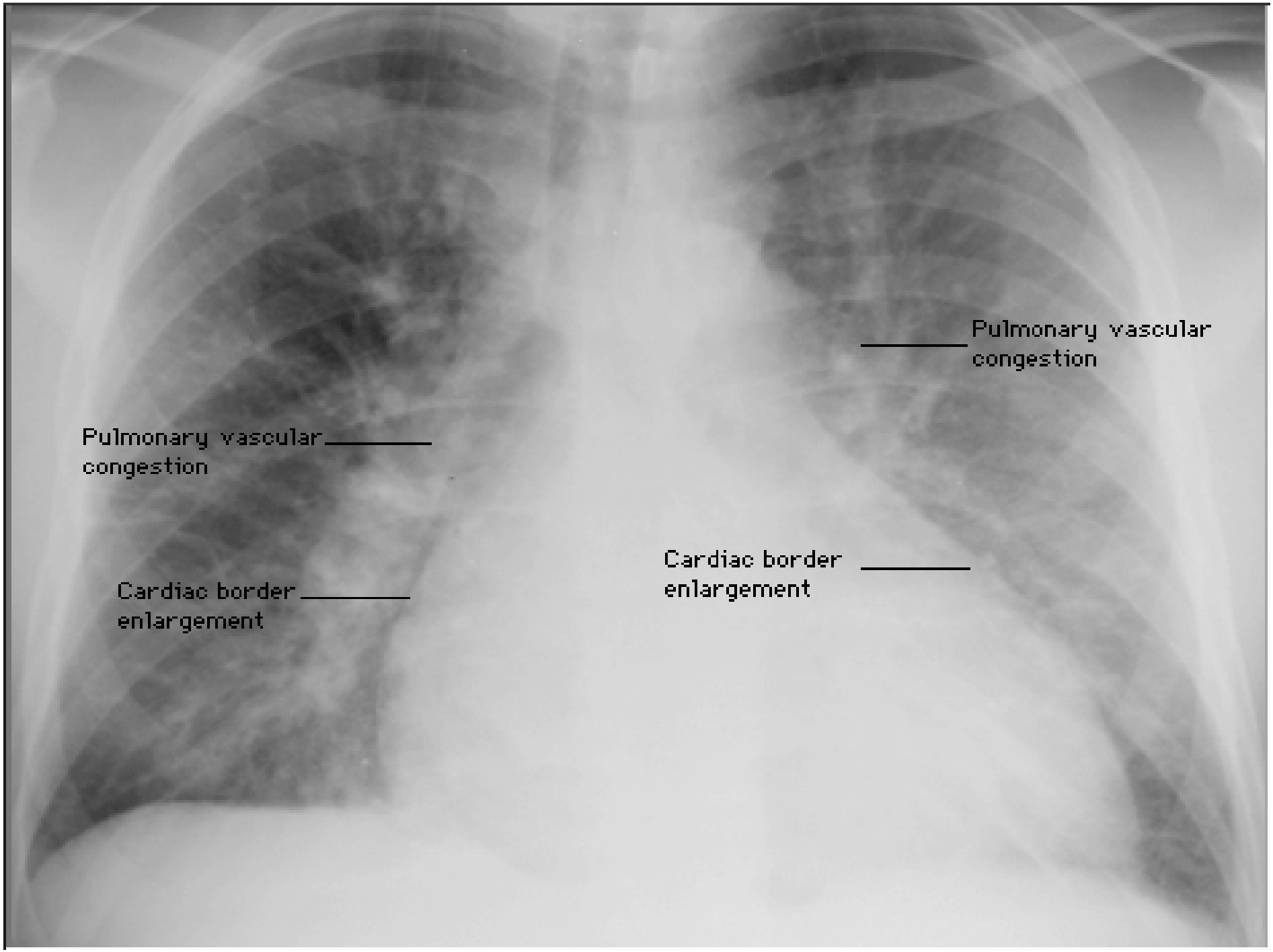
Loss of Sharp Costophrenic Angles



Check the hilar region

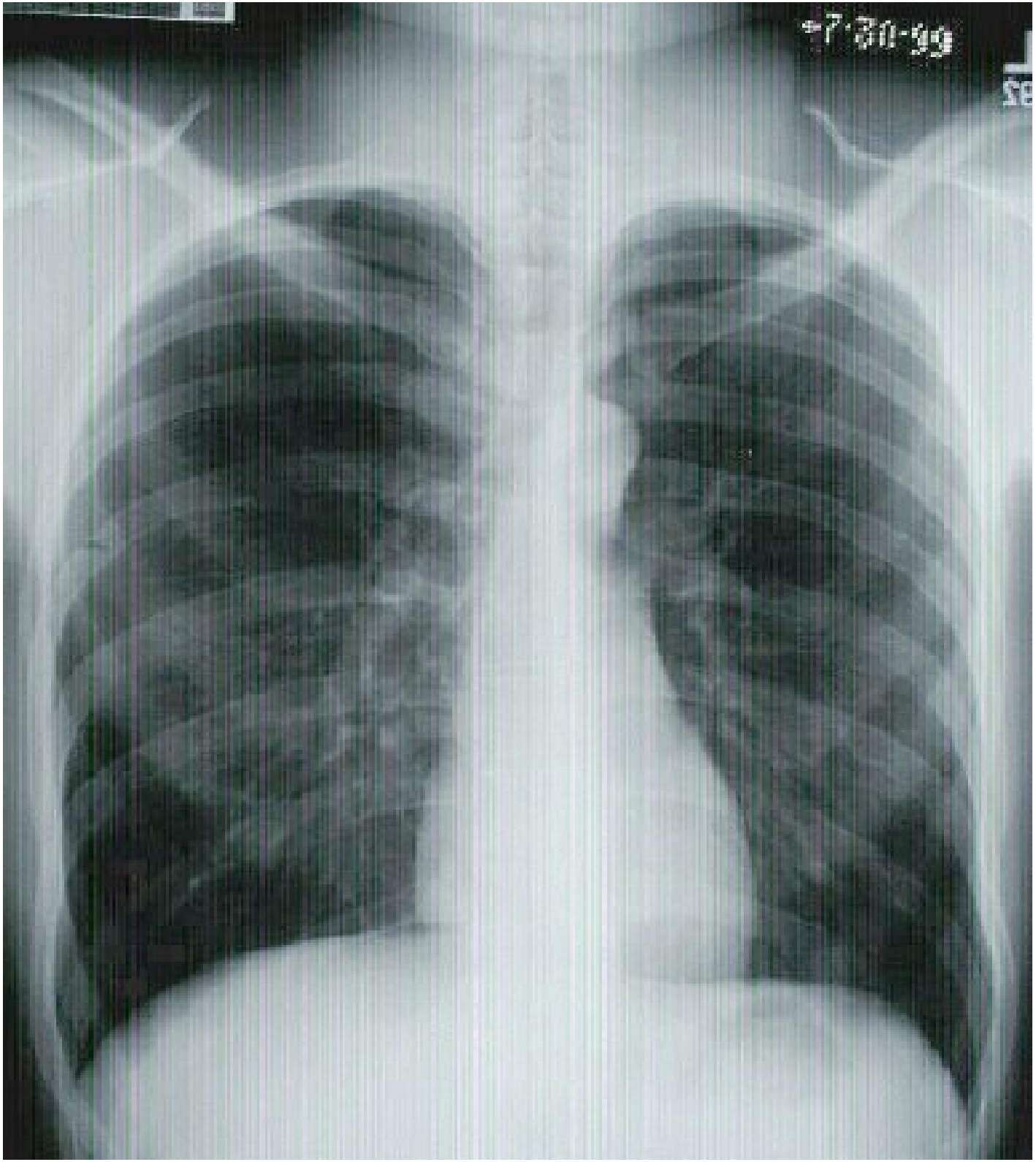
- The hilar – the large blood vessels going to and from the lung at the root of each lung where it meets the heart.
- Check for size and shape of aorta, nodes,enlarged vessels

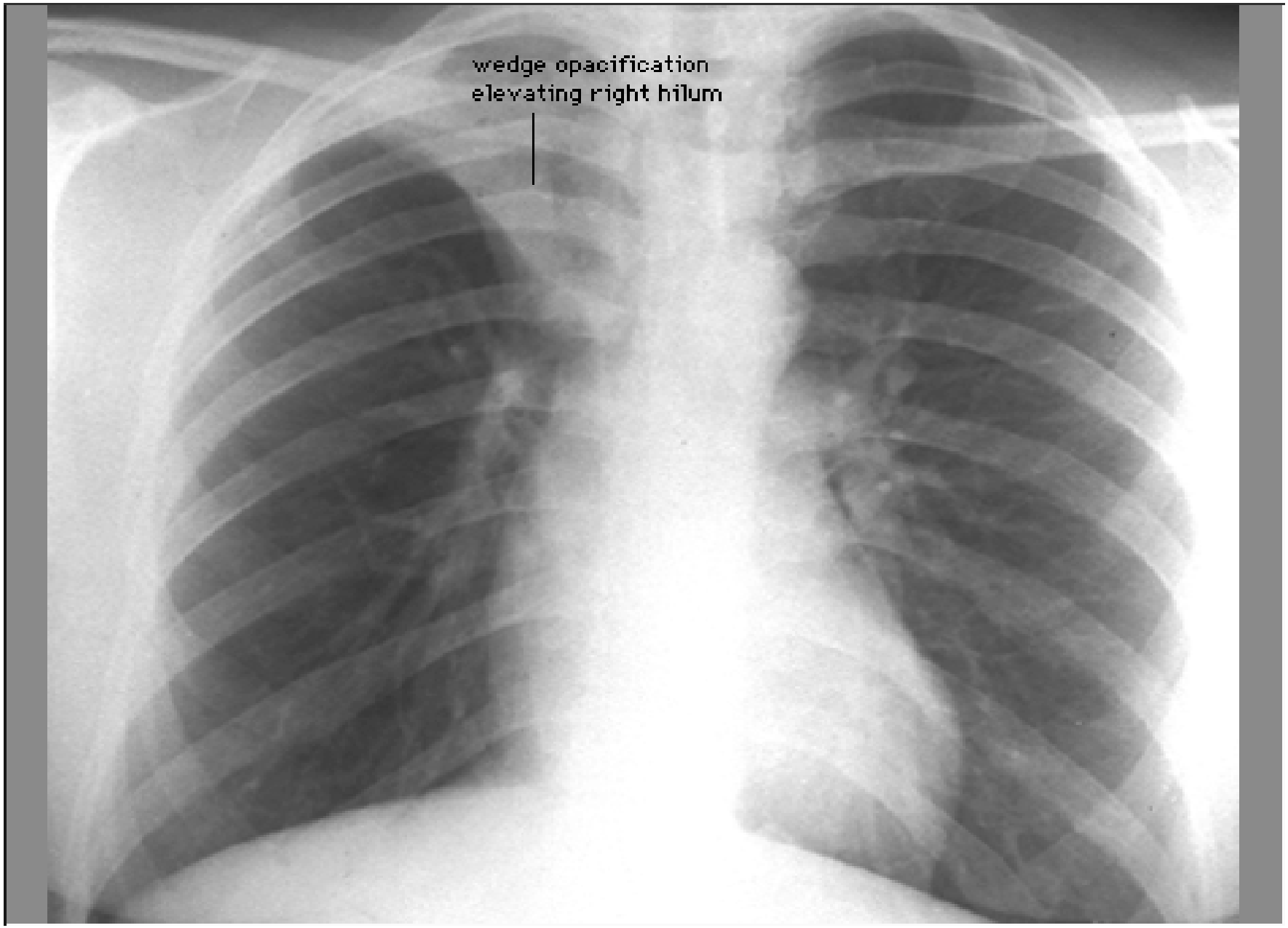


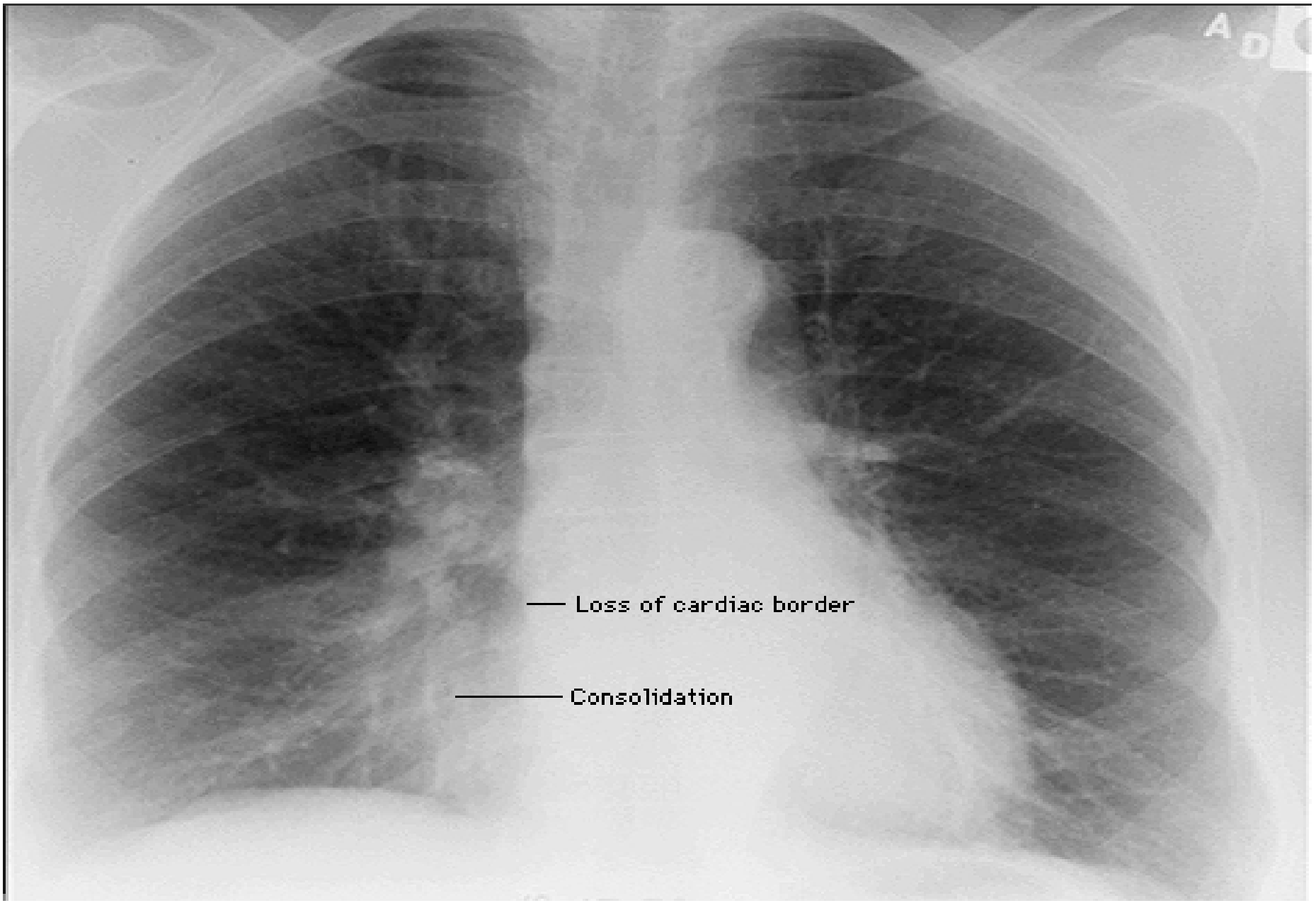

Pulmonary vascular congestion
Pulmonary vascular congestion
Cardiac border enlargement
Cardiac border enlargement

Finally, Check the Lung Fields

- Infiltrates
- Increased interstitial markings
- Masses
- Absence of normal margins
- Air bronchograms
- Increased vascularity




wedge opacification
elevating right hilum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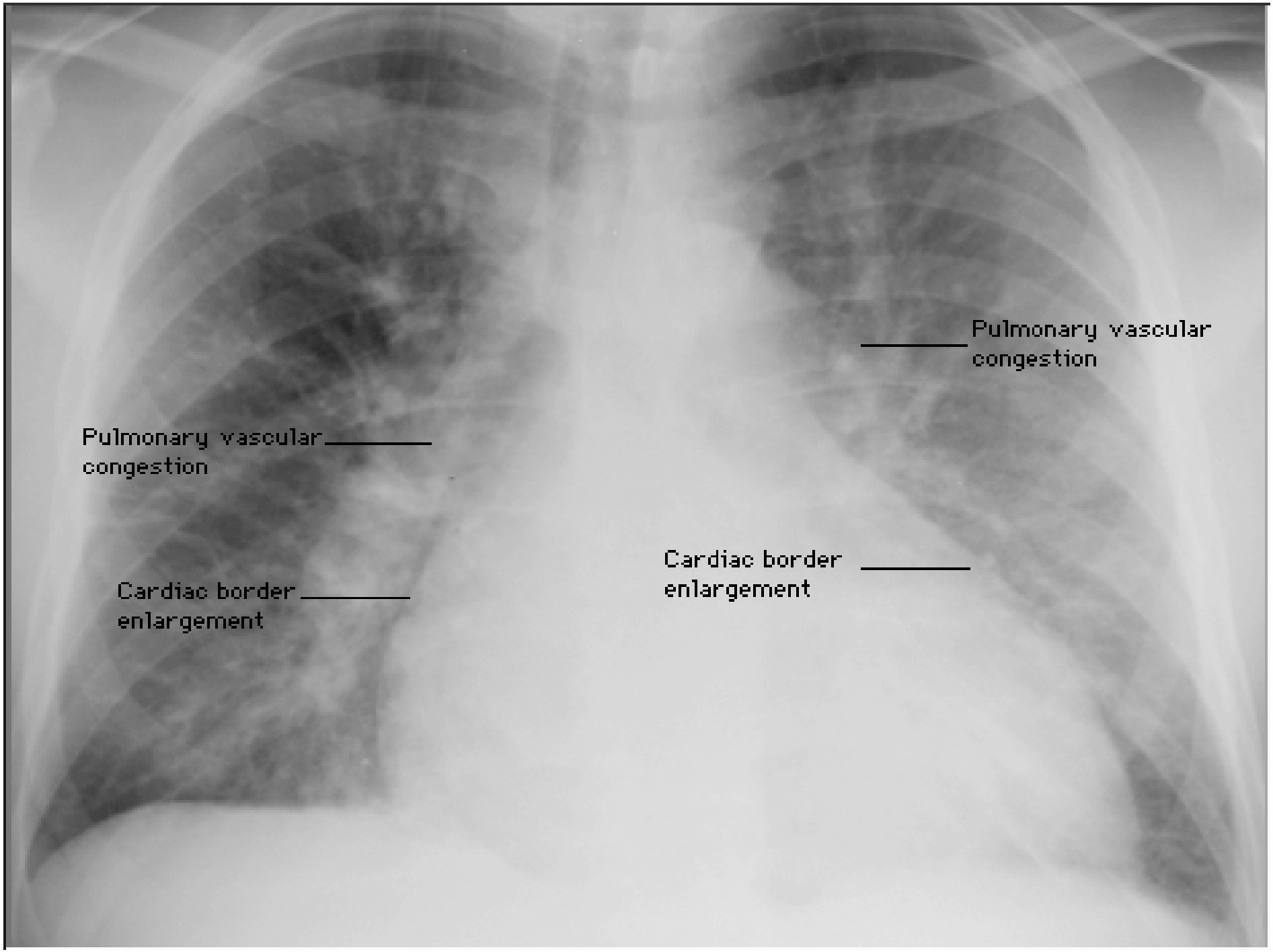
Consolidation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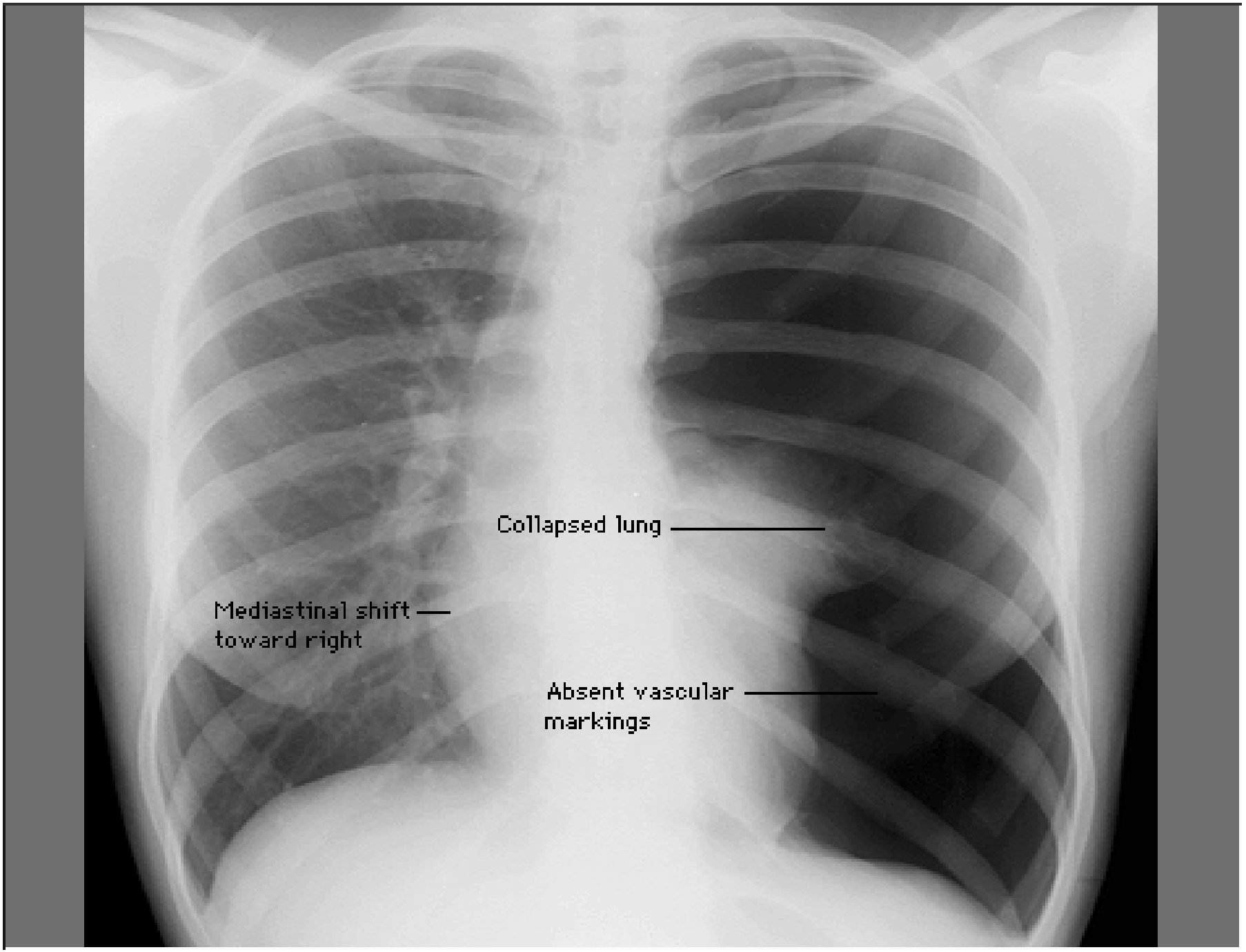
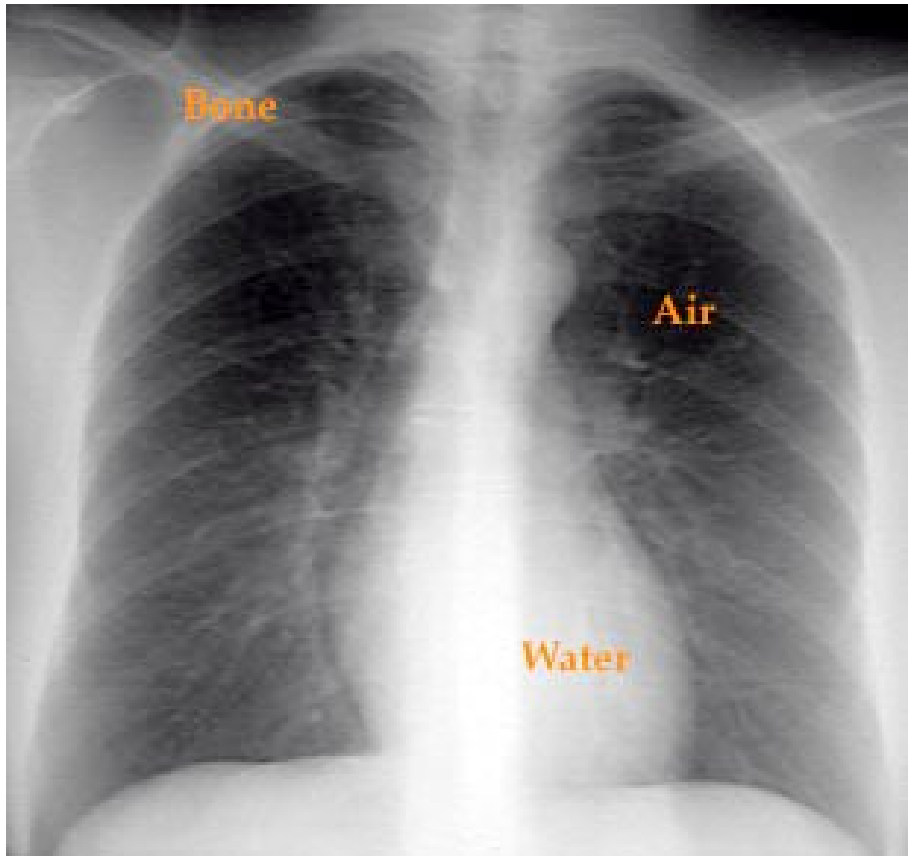
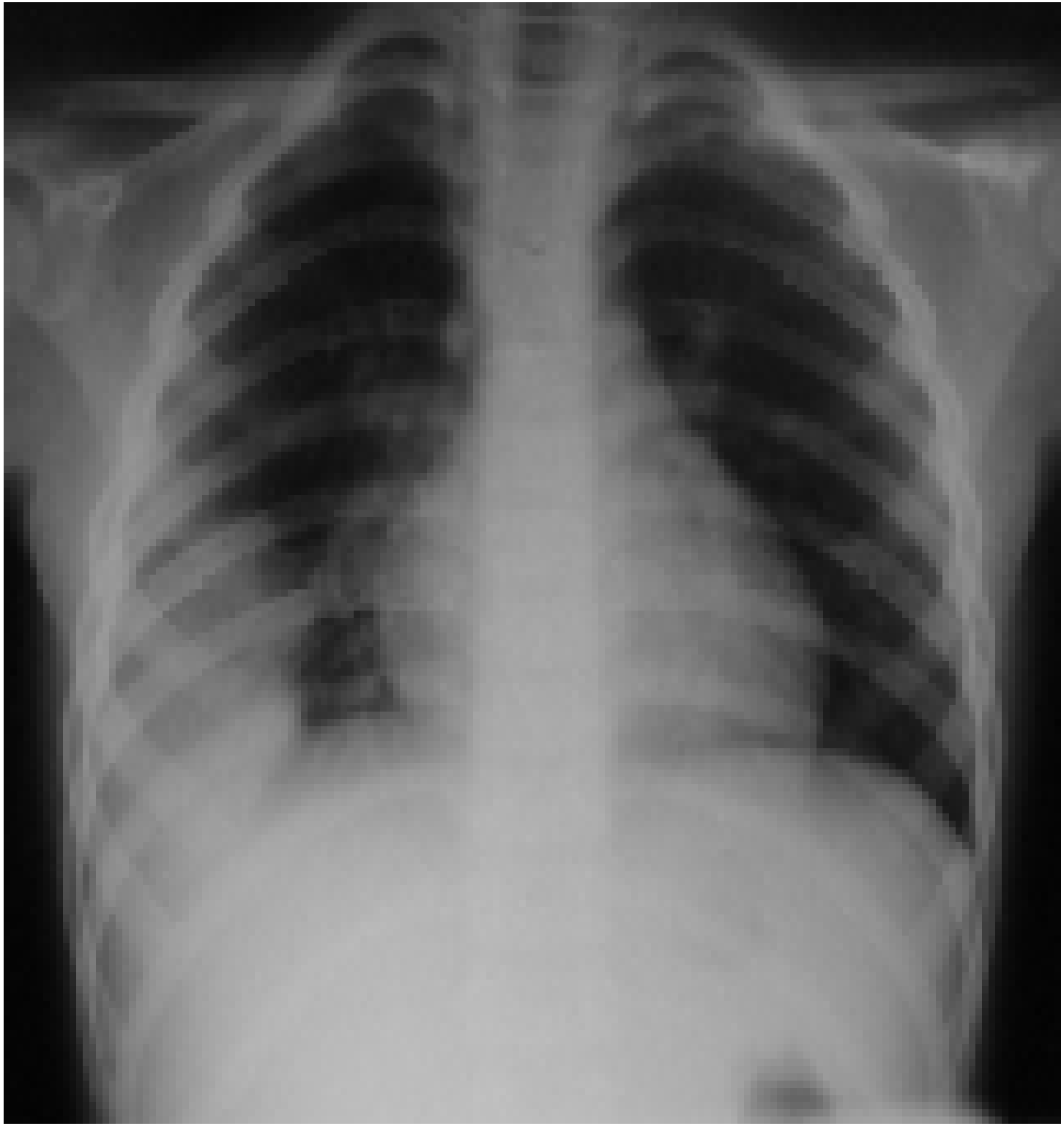
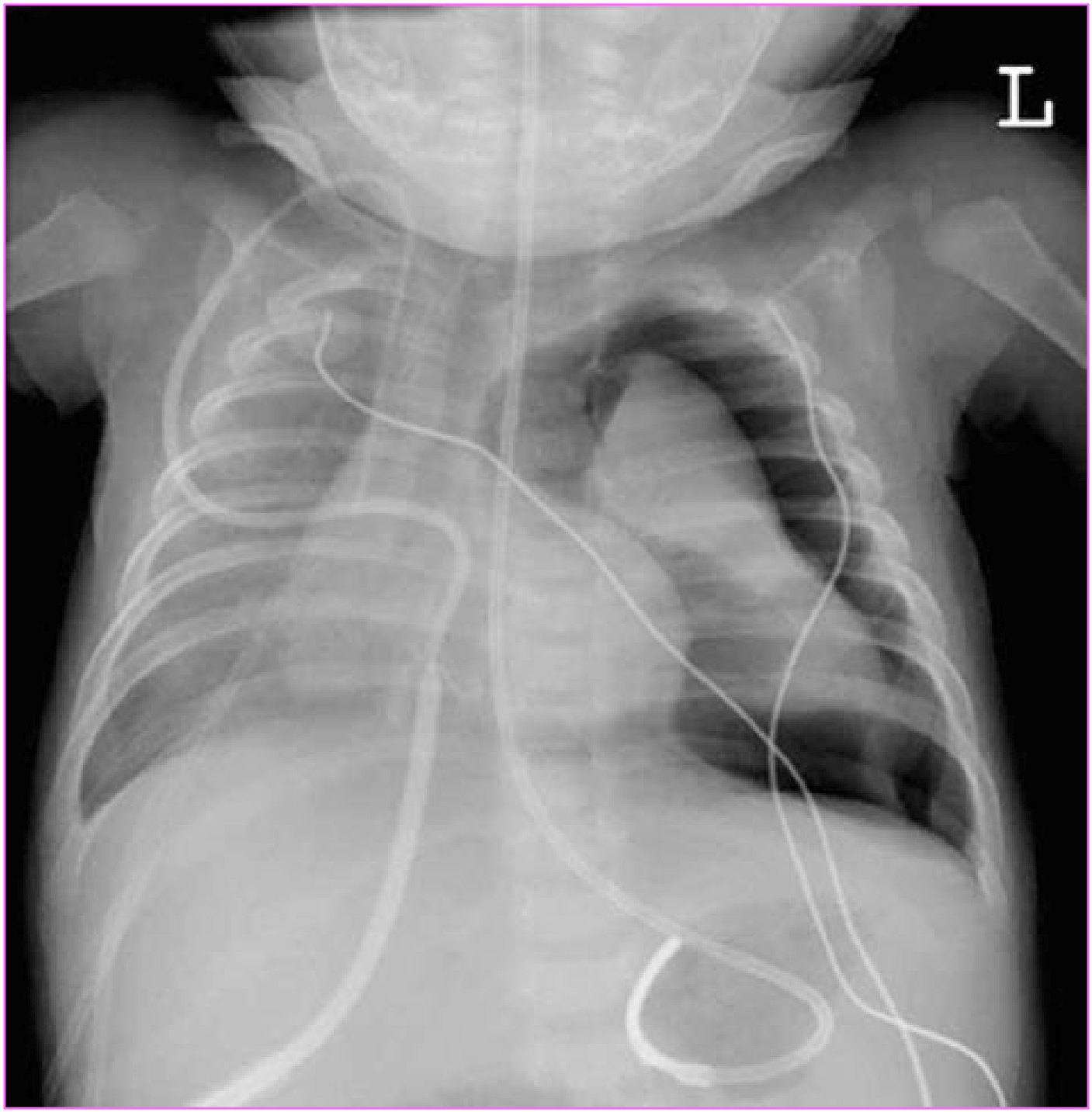
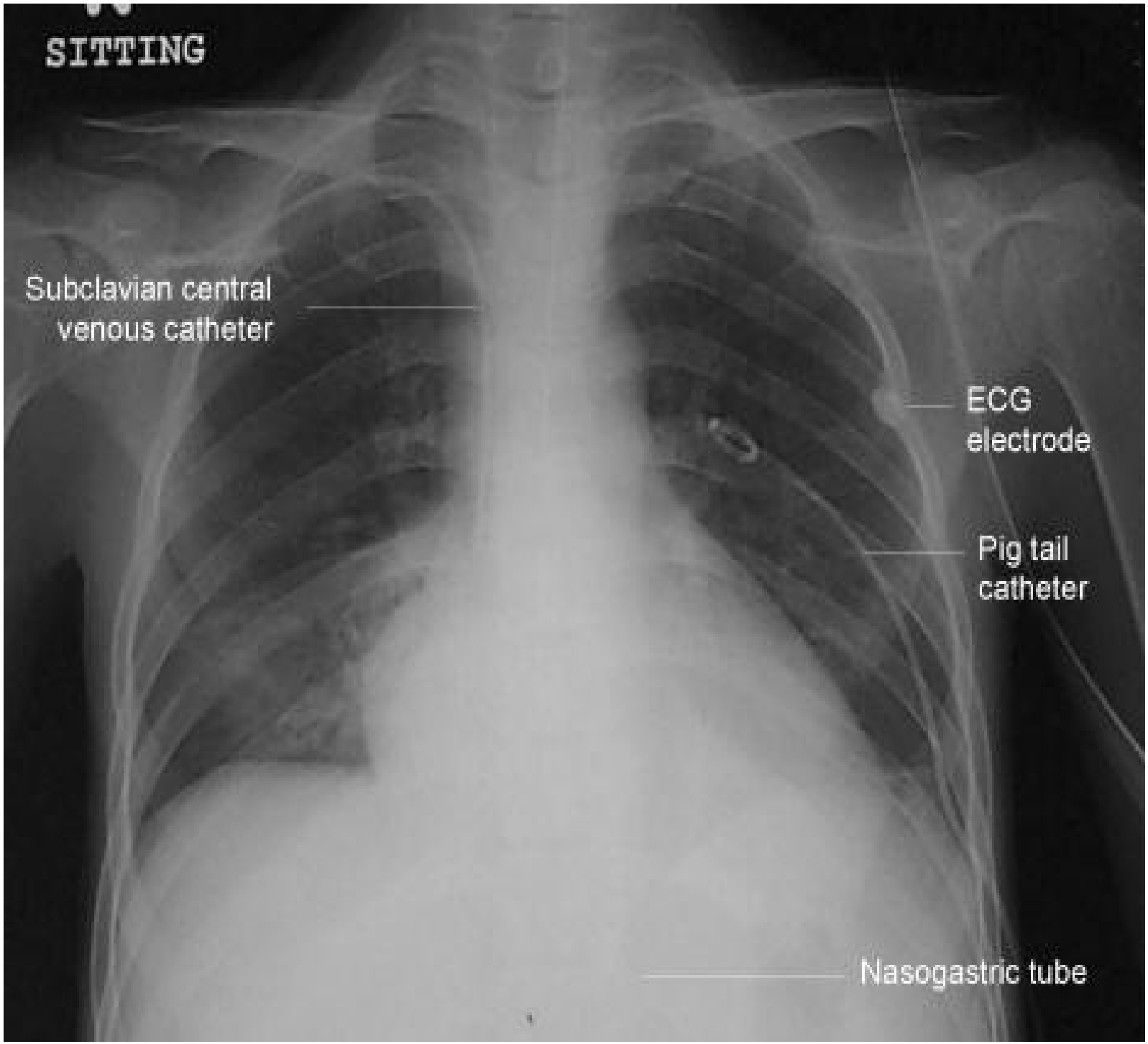
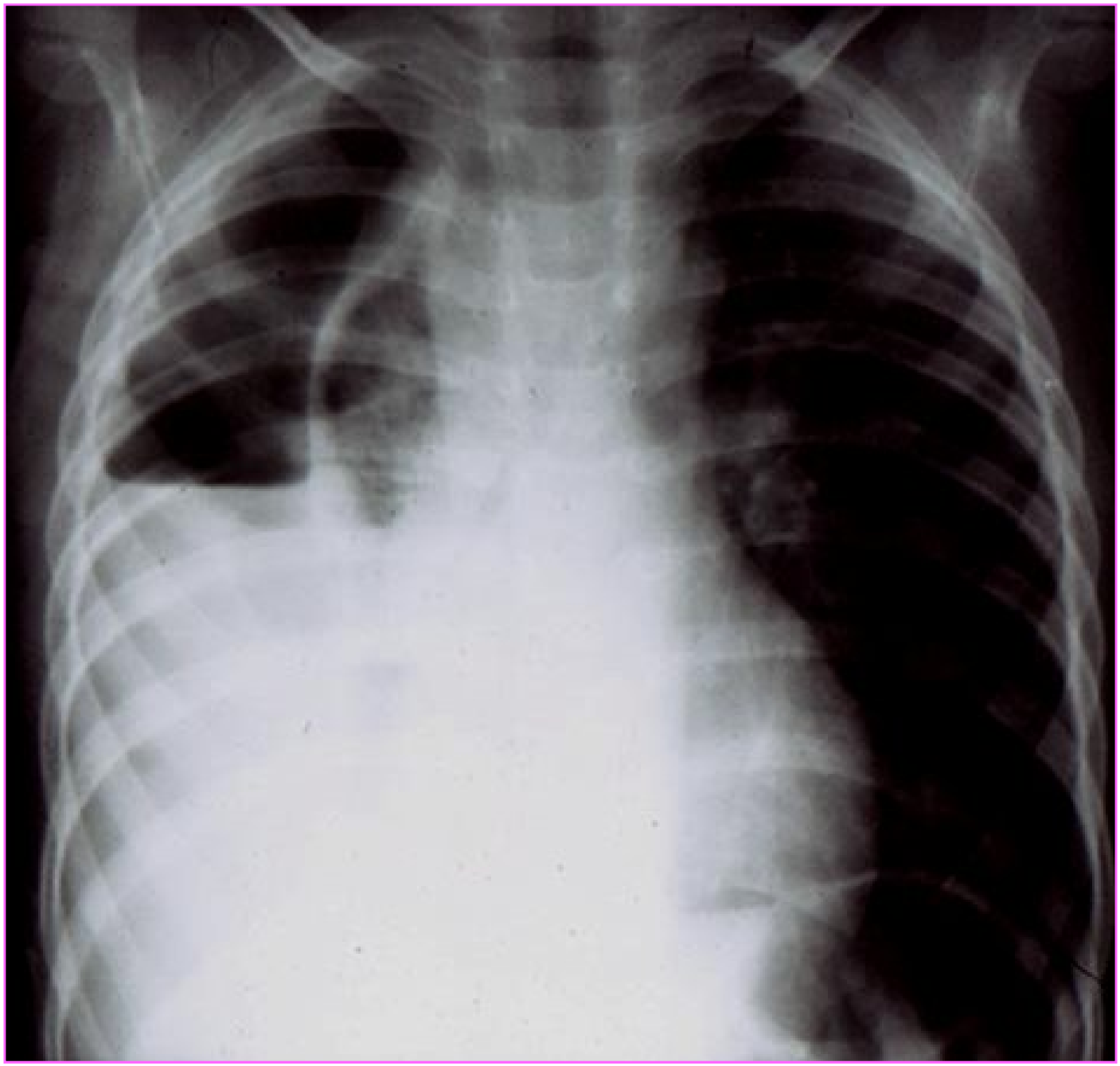

Collapsed lung
Mediastinal shift toward right
Absent vascular markings

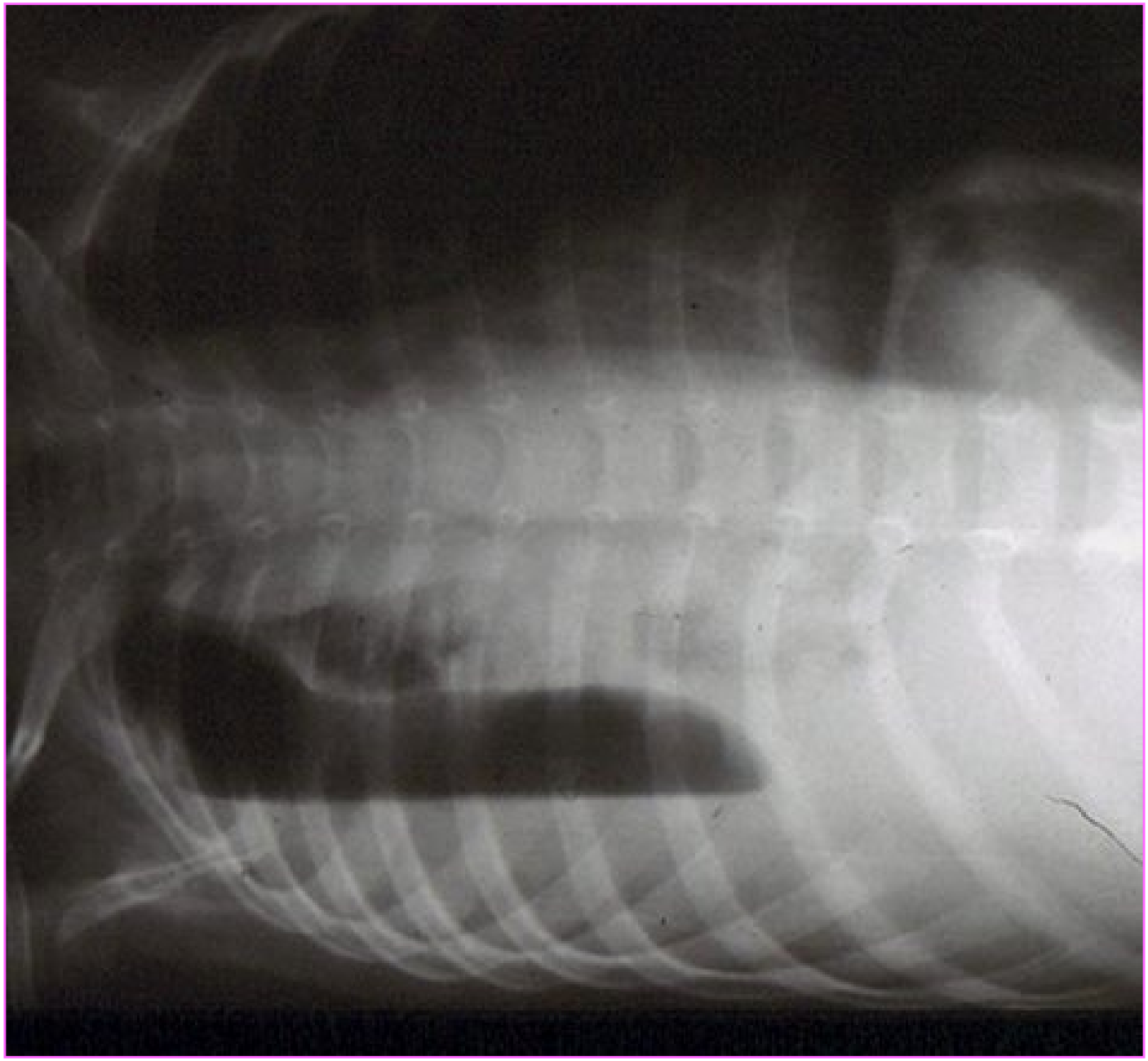

Bone
Air
Water



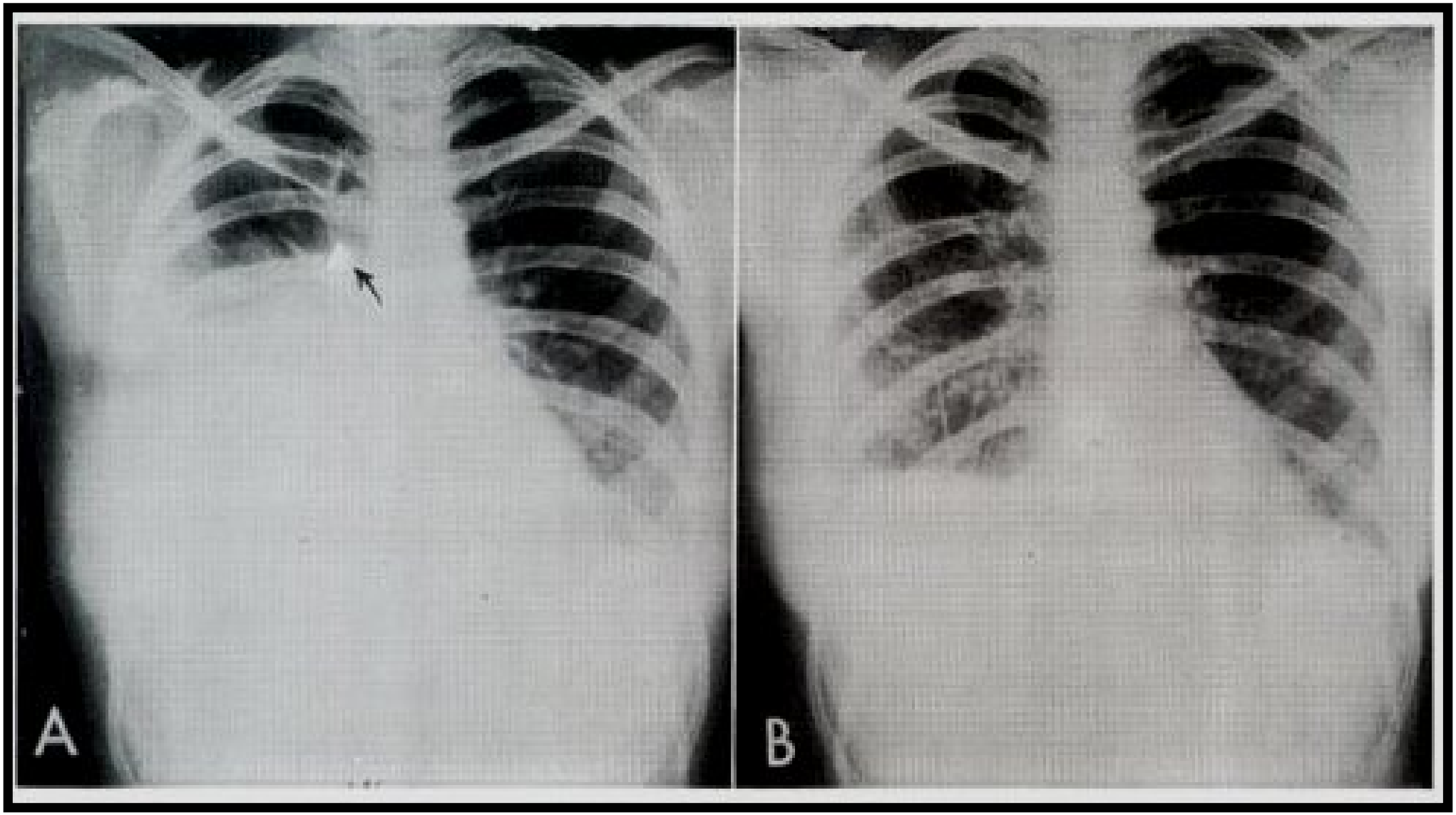

L

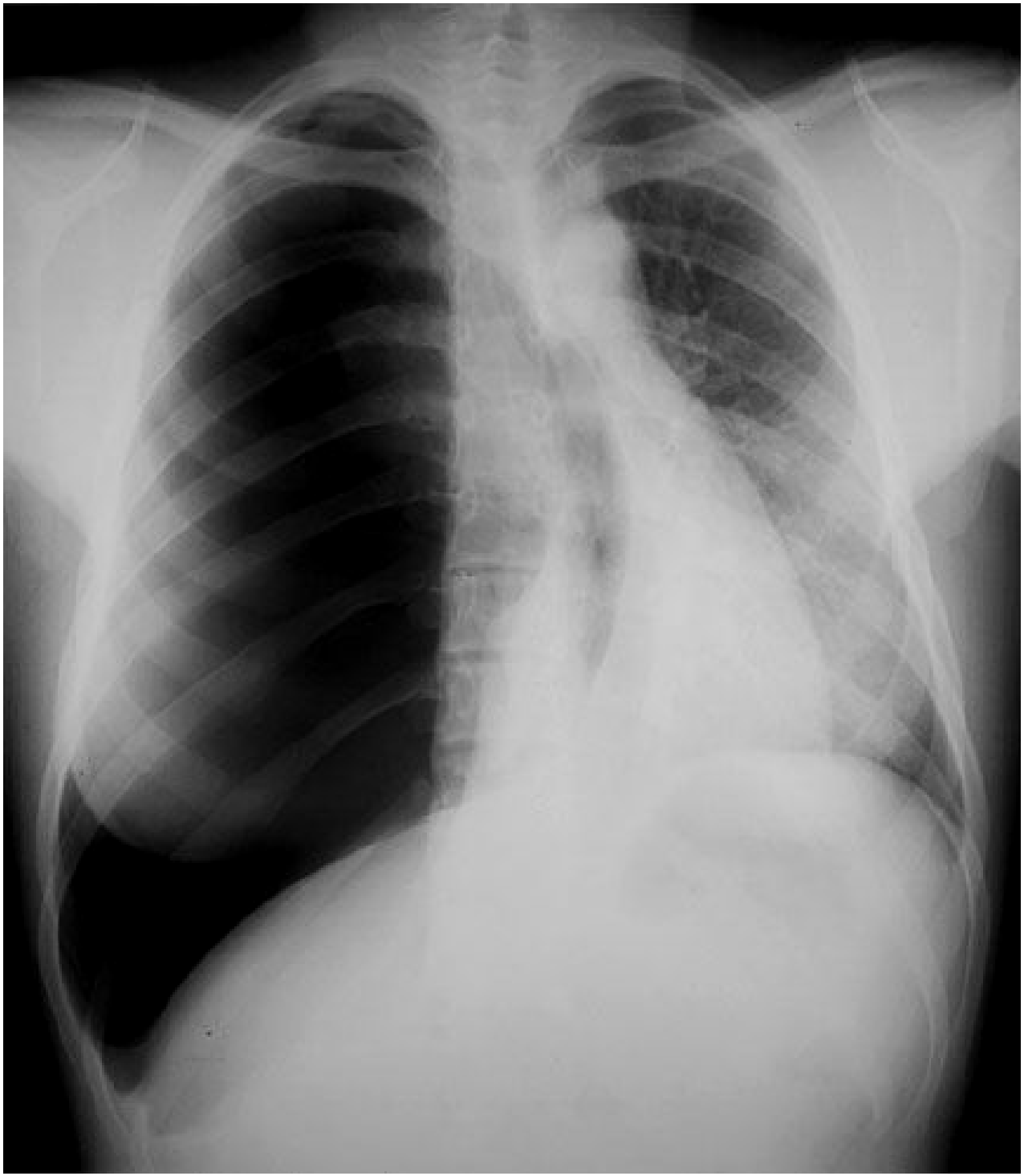

SITTING
Subclavian central venous catheter
ECG electrode
Pig tail catheter
Nasogastric tube

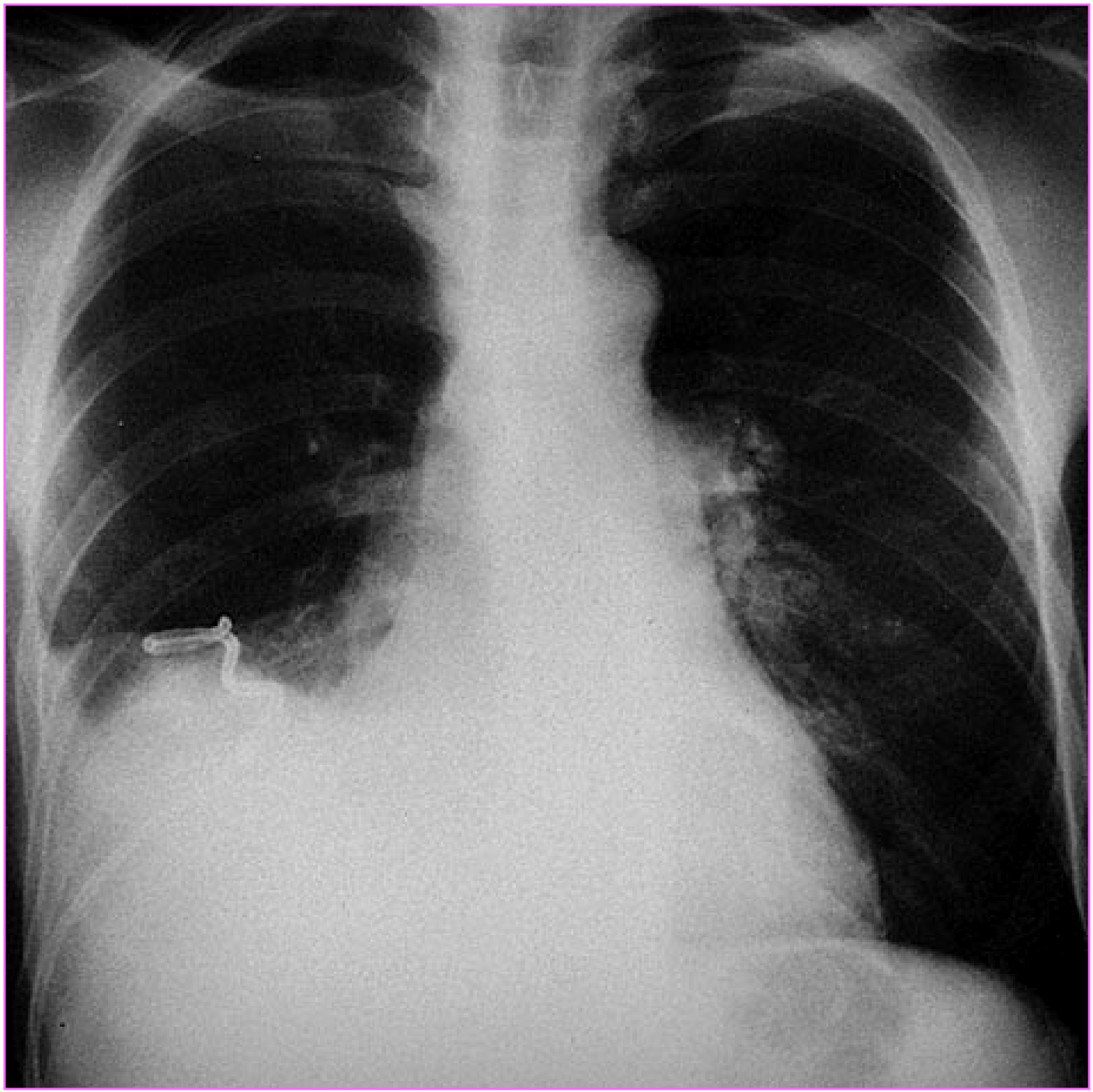


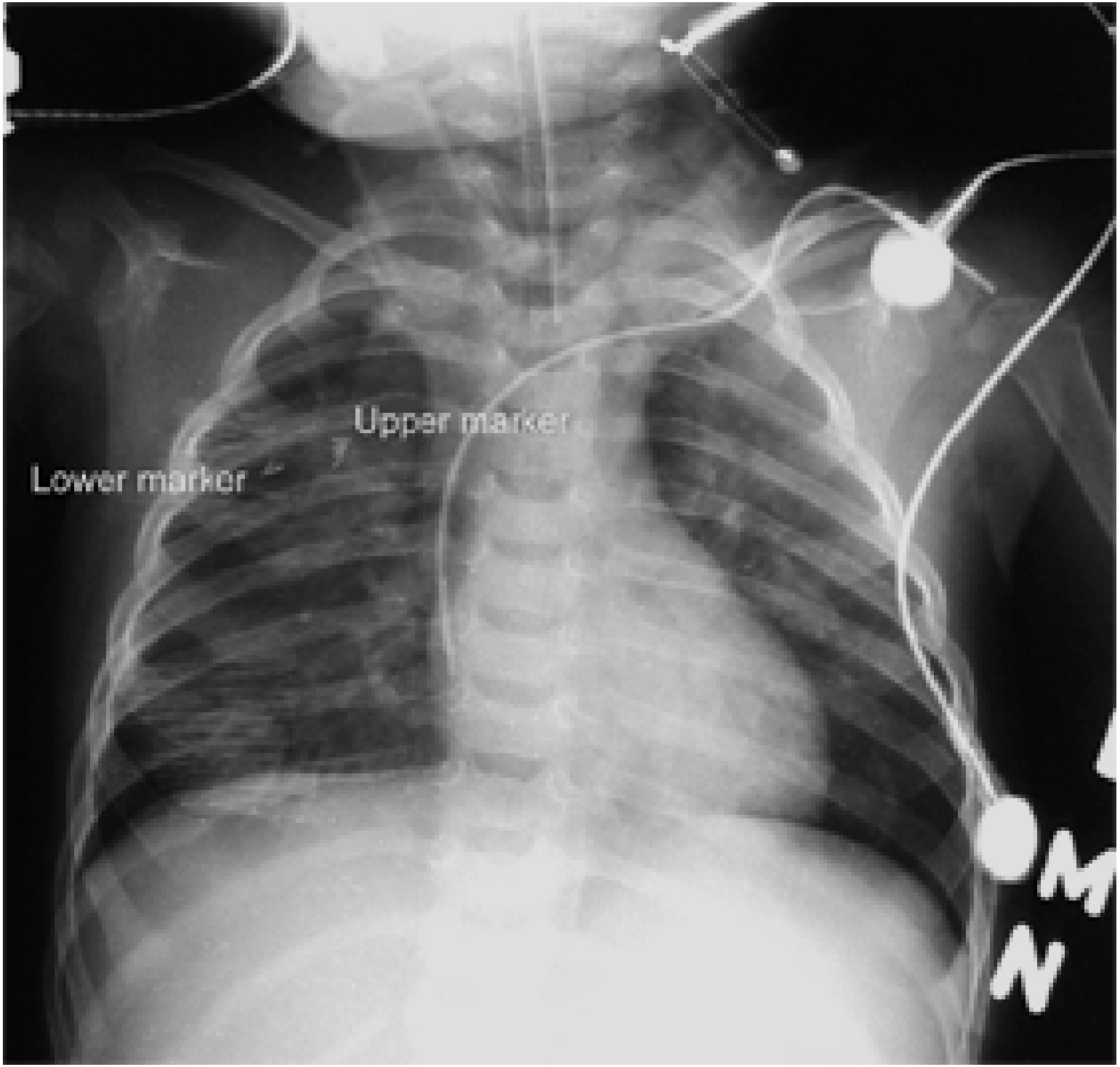


Hemothorax








Upper marker
Lower marker