Respiratory imaging

Asma S Albtoosh,MD
Jordan university hospital

CXR interpretation

Identification

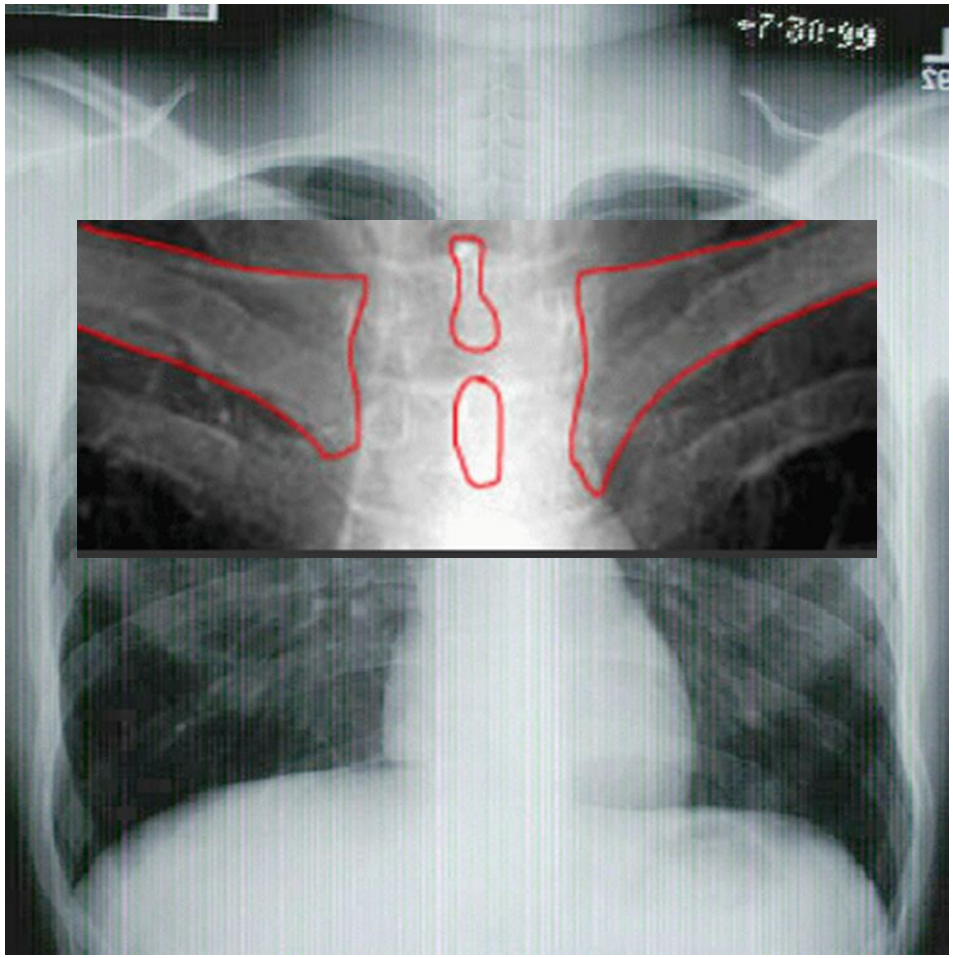
Correct patient

Correct date & time

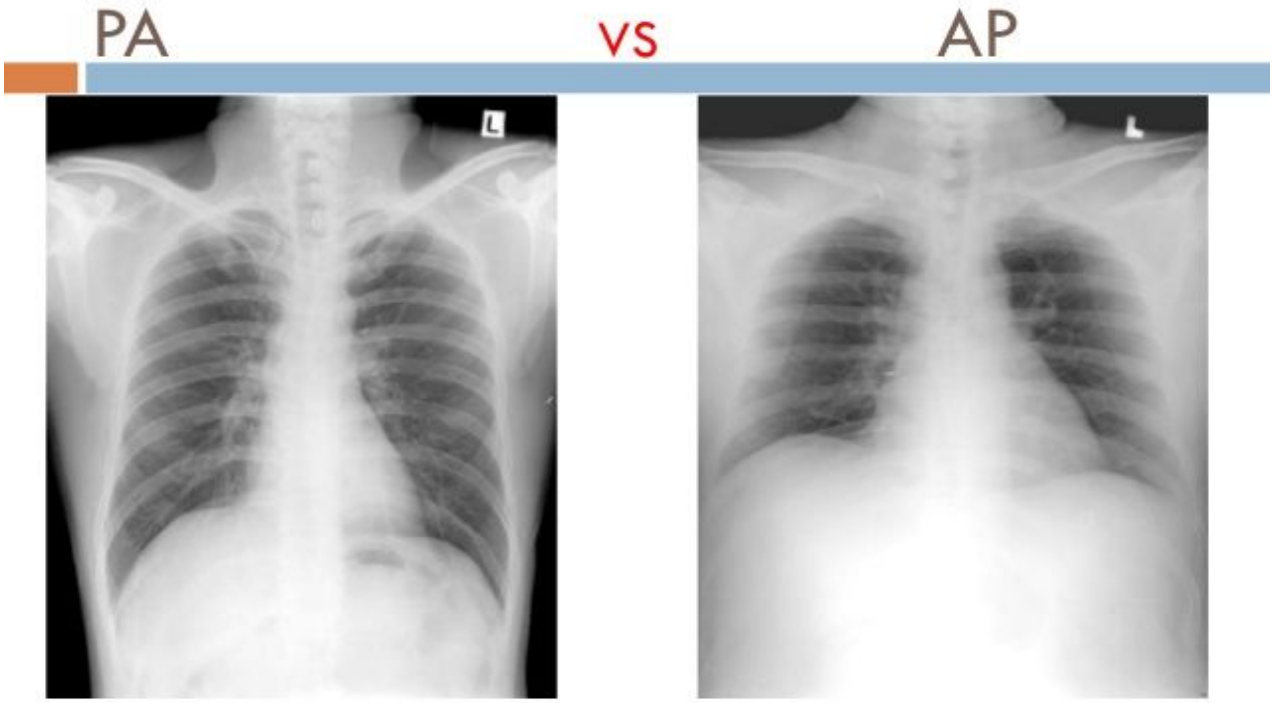
Technique: RIPE(rotation. inspiration. Projection, exposure)

Abnormal finding

Rotation and inspiration



Projection

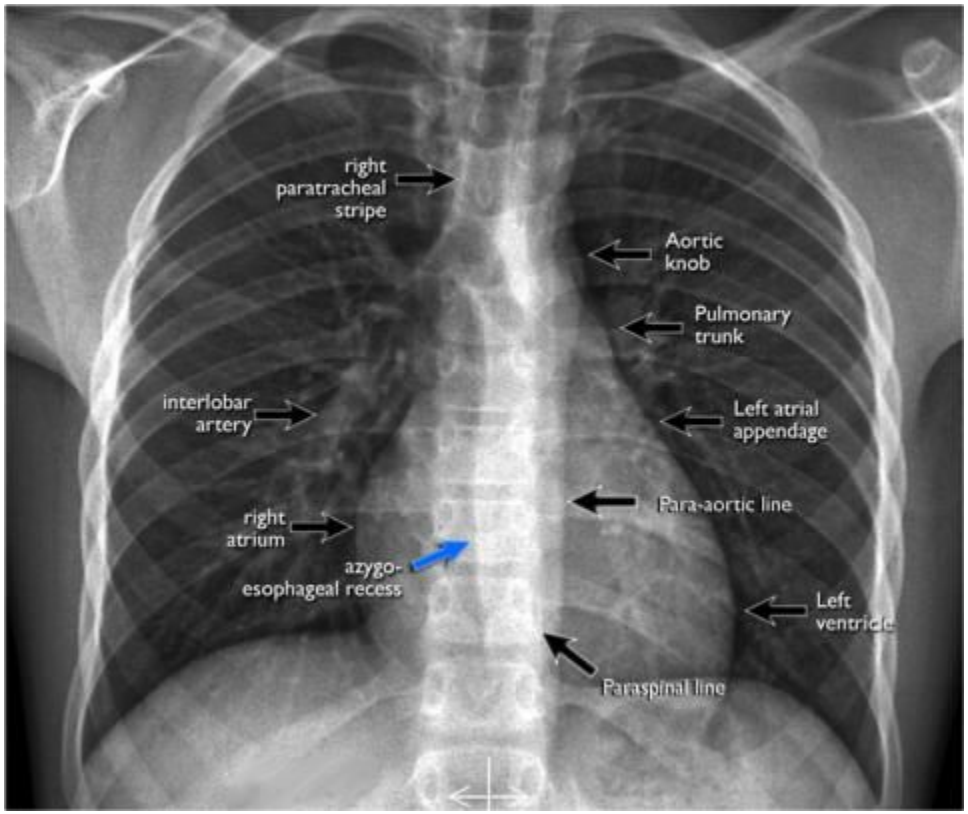


Exposure=Penetration

Over penetrated

Under penetrated

Normal anatomy



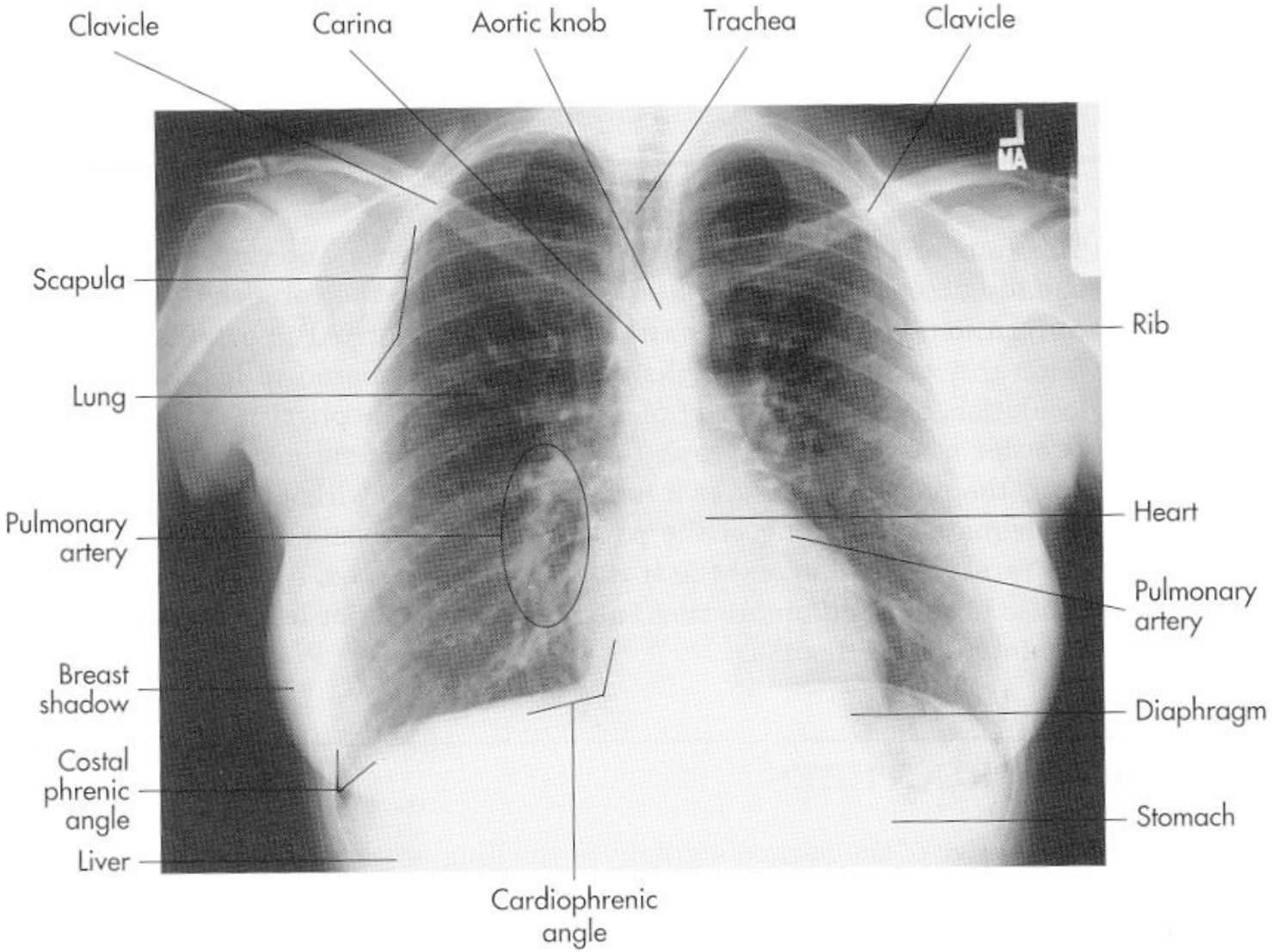
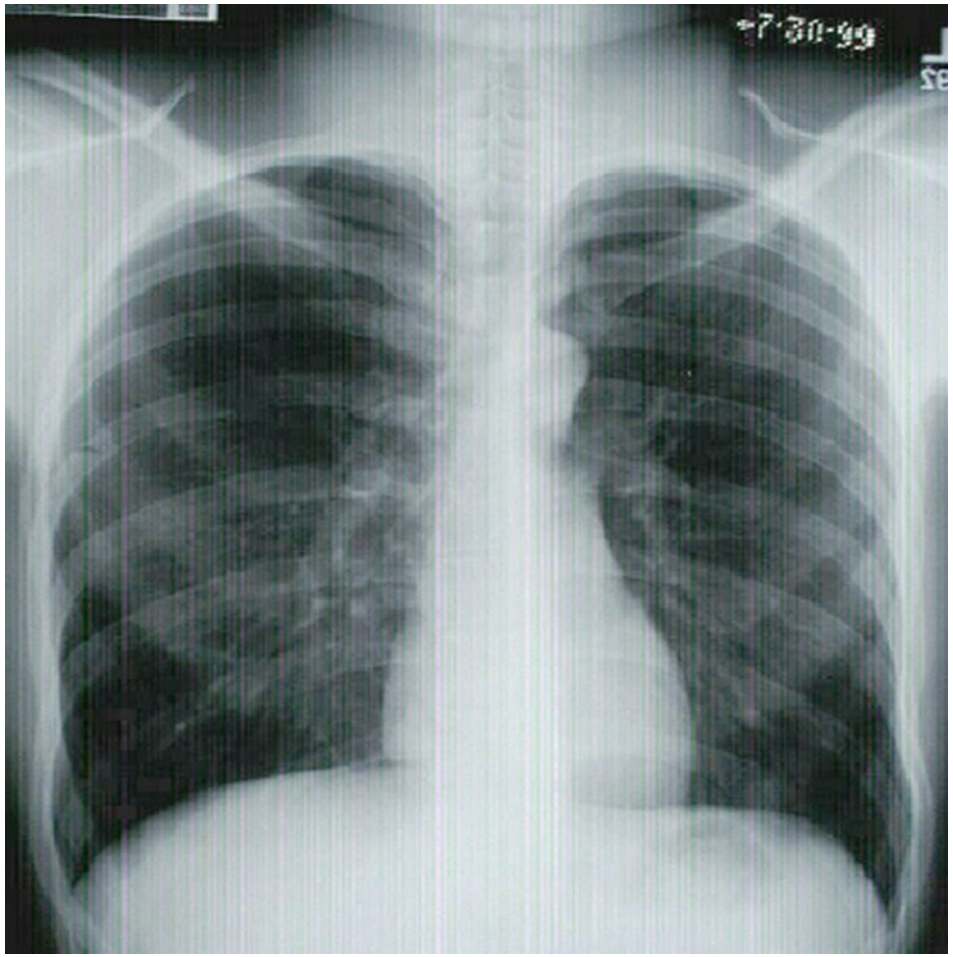
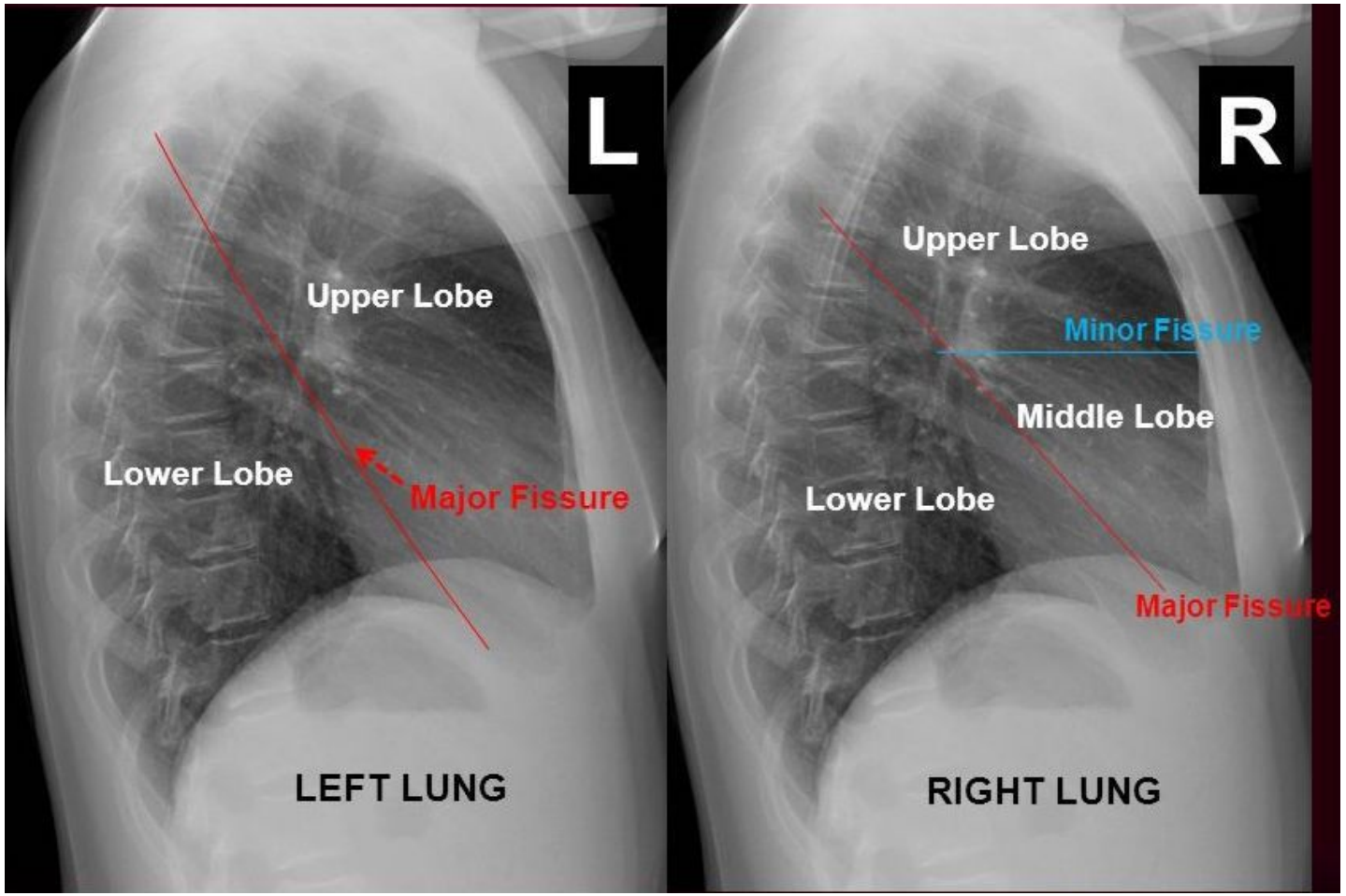


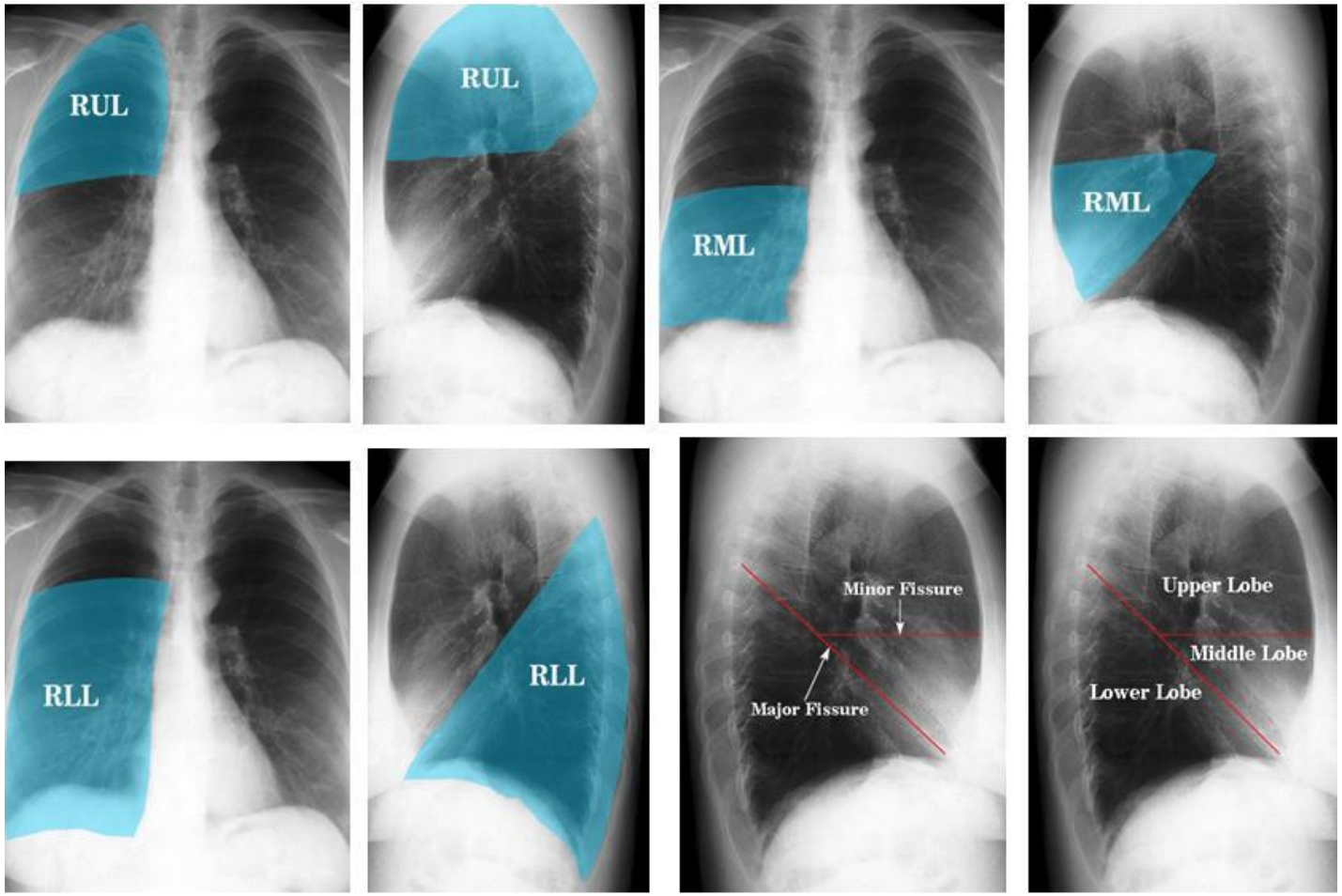
Fig. 3-1 Normal position of anatomical structures on a posterior or anterior chest radiograph.

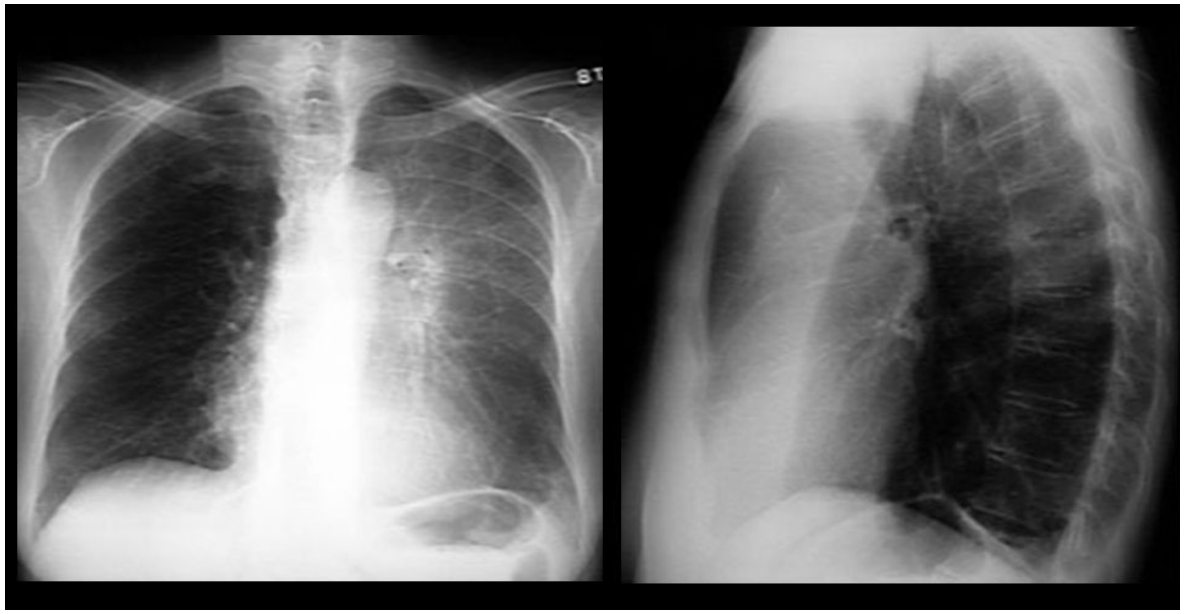
Zones or lobes?



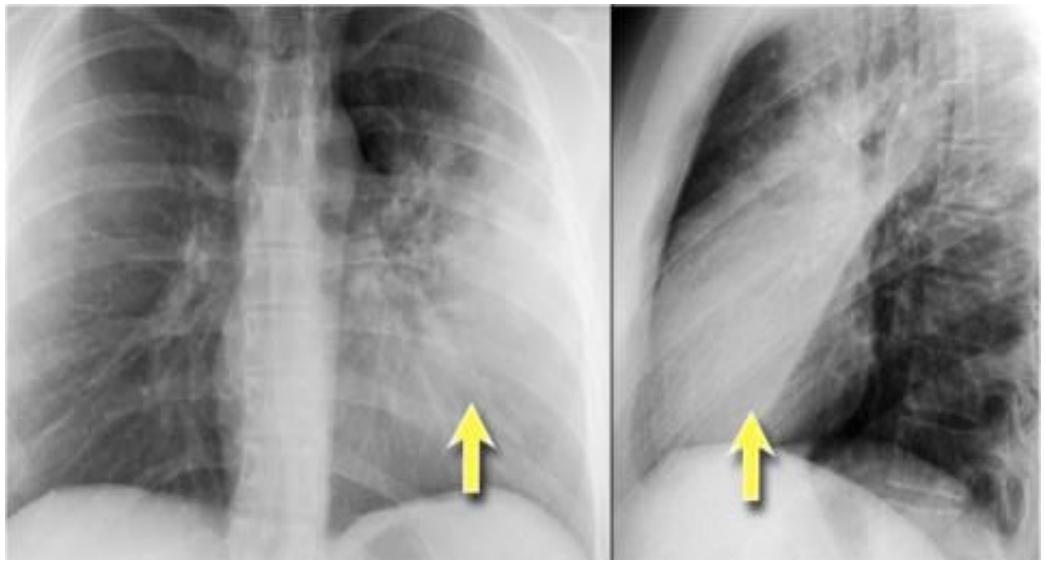
Lateral CXR

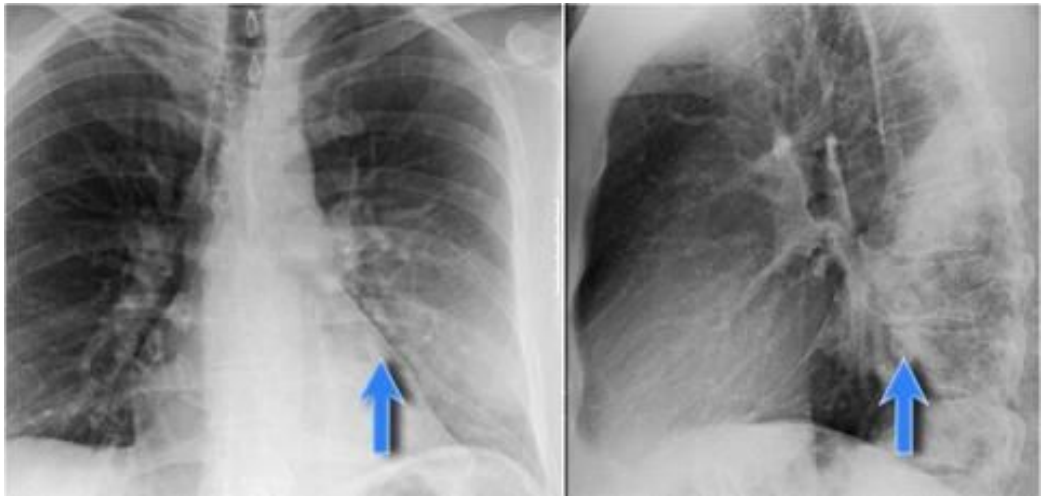

L
Upper Lobe
Lower Lobe
Major Fissure
LEFT LUNG
R
Upper Lobe
Minor Fissure
Middle Lobe
Lower Lobe
Major Fissure
RIGHT LUNG


RUL
RUL
RML
RML
RLL
RLL
Minor Fissure
Major Fissure
Upper Lobe
Middle Lobe
Lower Lobe



A silhouette sign

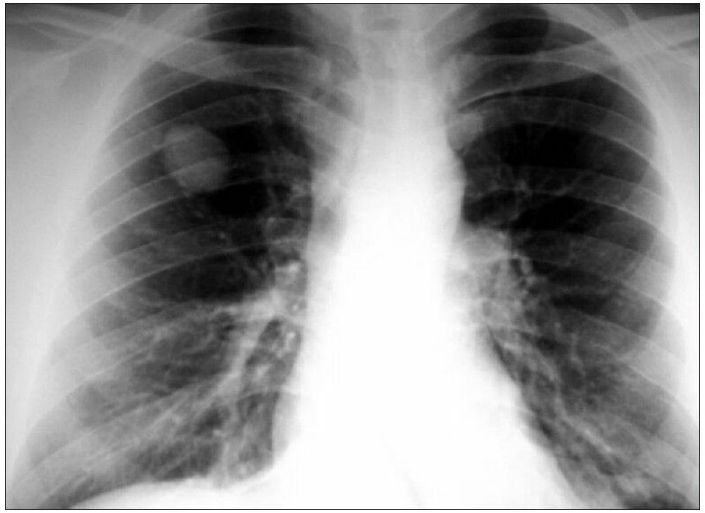


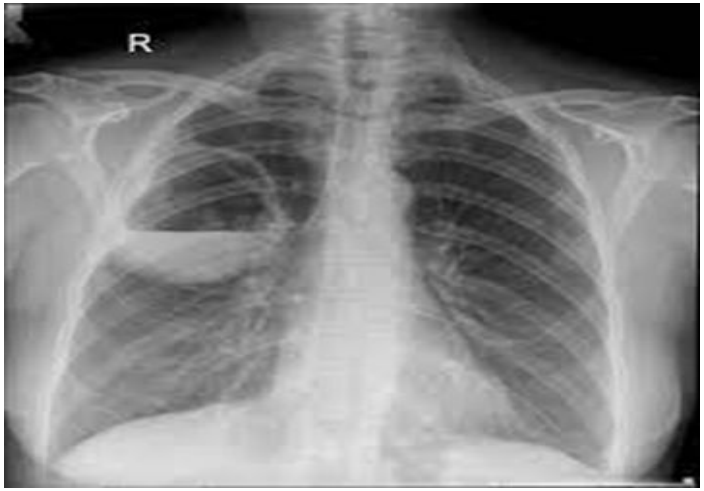


ABCDE

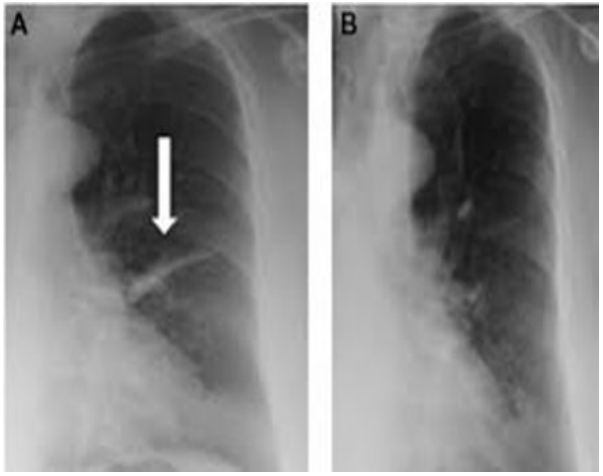
- Airway.
- Breathing.
- Cardiac, hila and mediastinum.
- Diaphragm.
- Everything else .

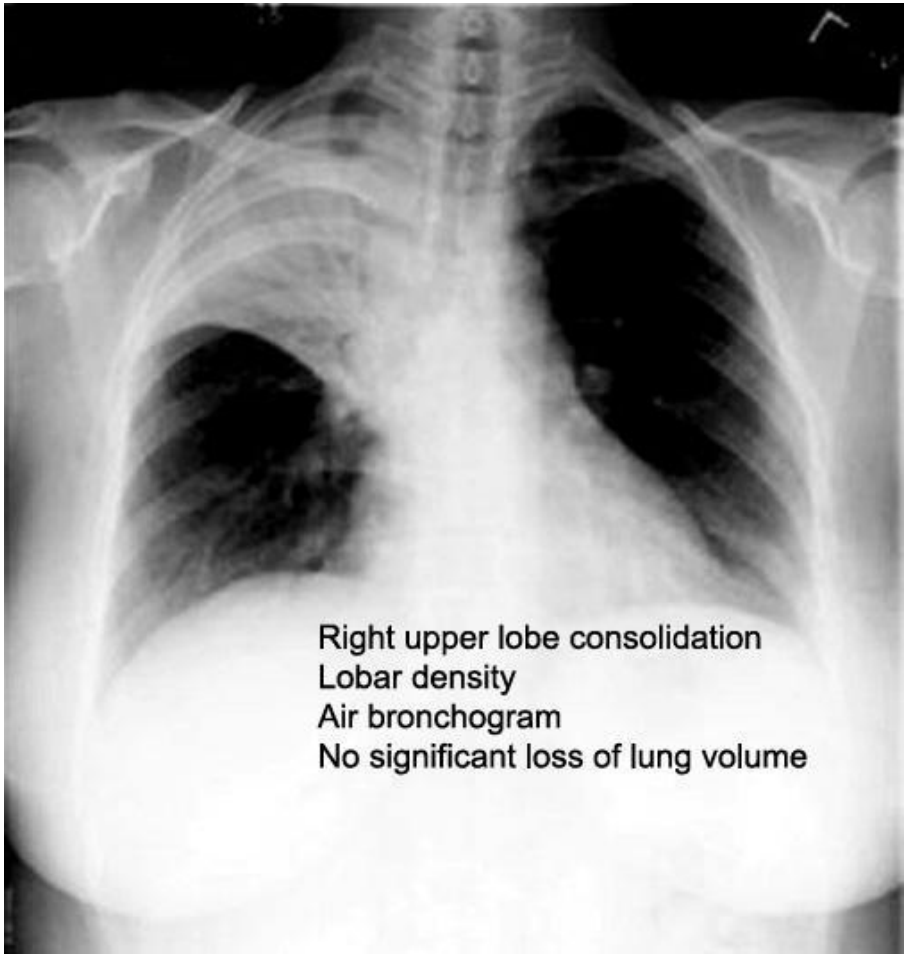
Focal lung lesions





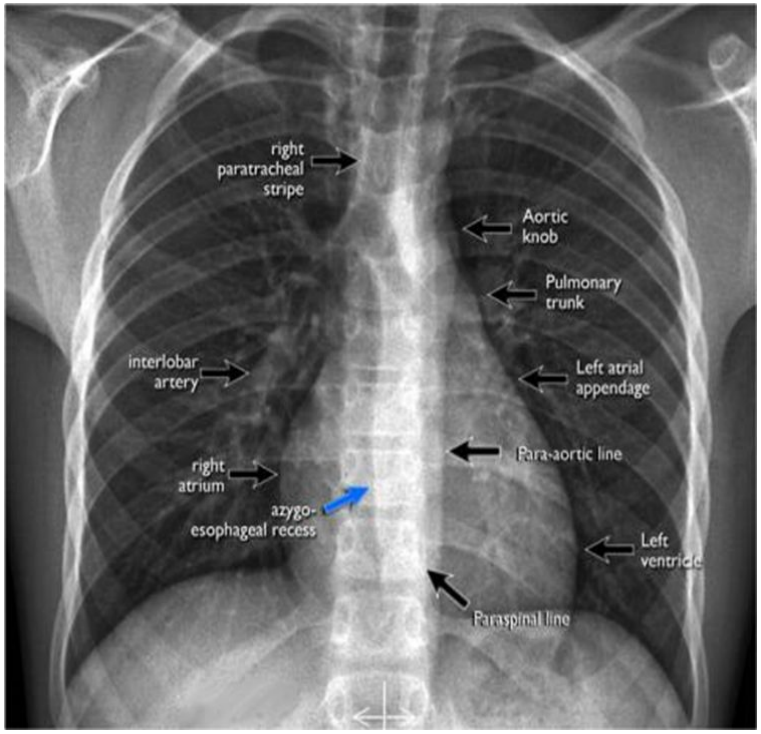
Focal lung lesions. Cont'd

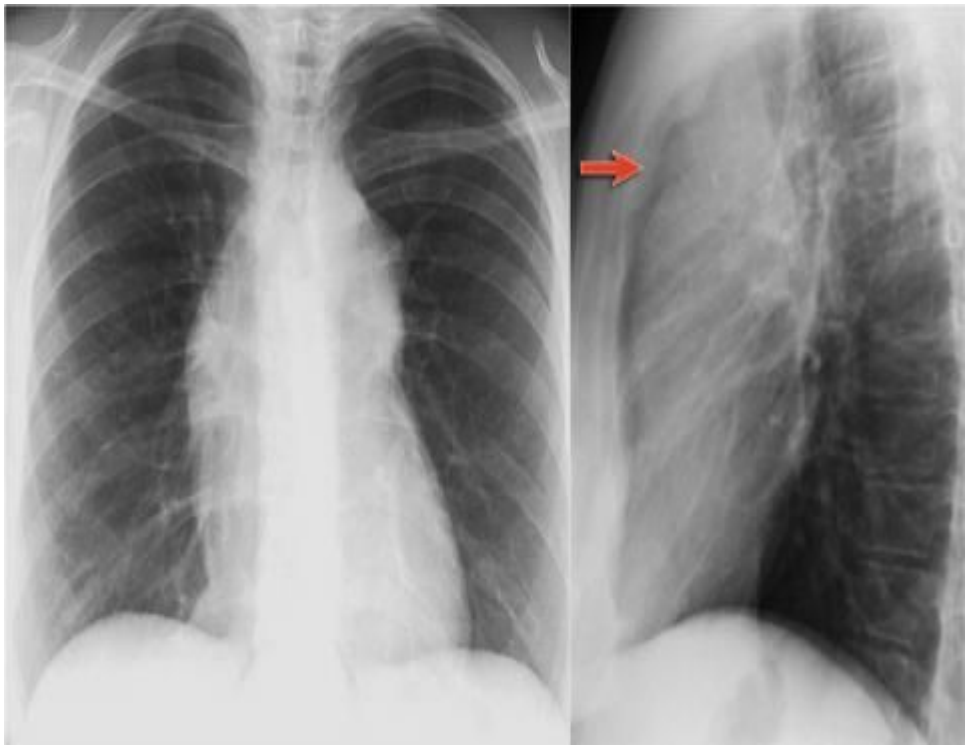



Right upper lobe consolidation
Lobar density
Air bronchogram
No significant loss of lung volume

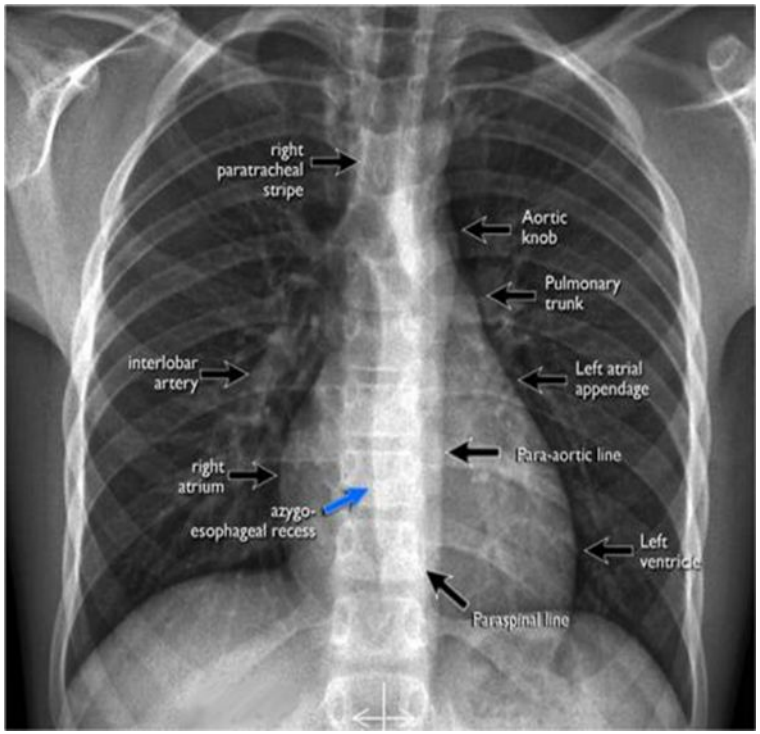
Diffuse lung lesions

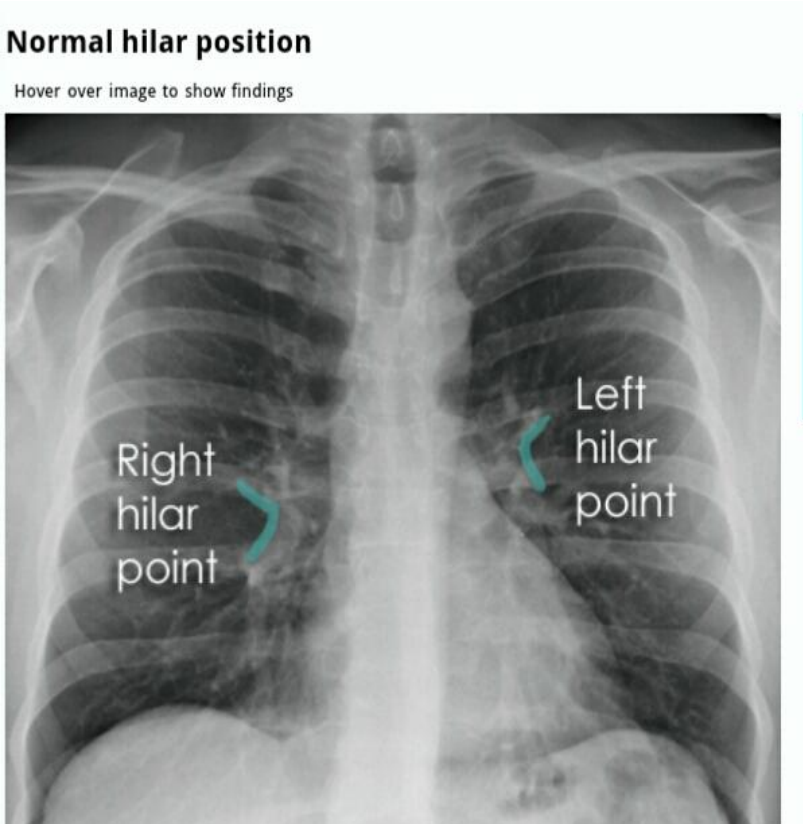
Mediastinum

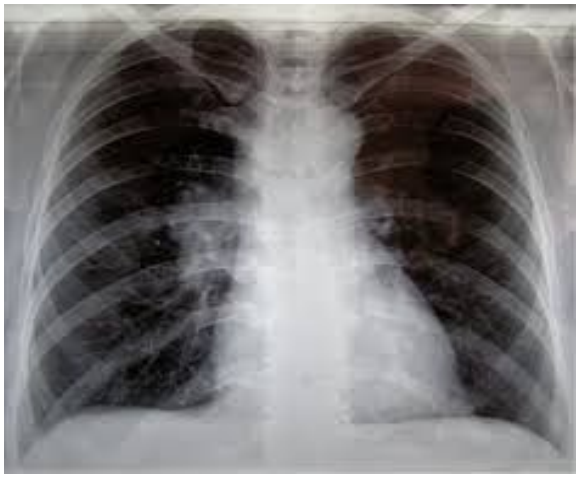


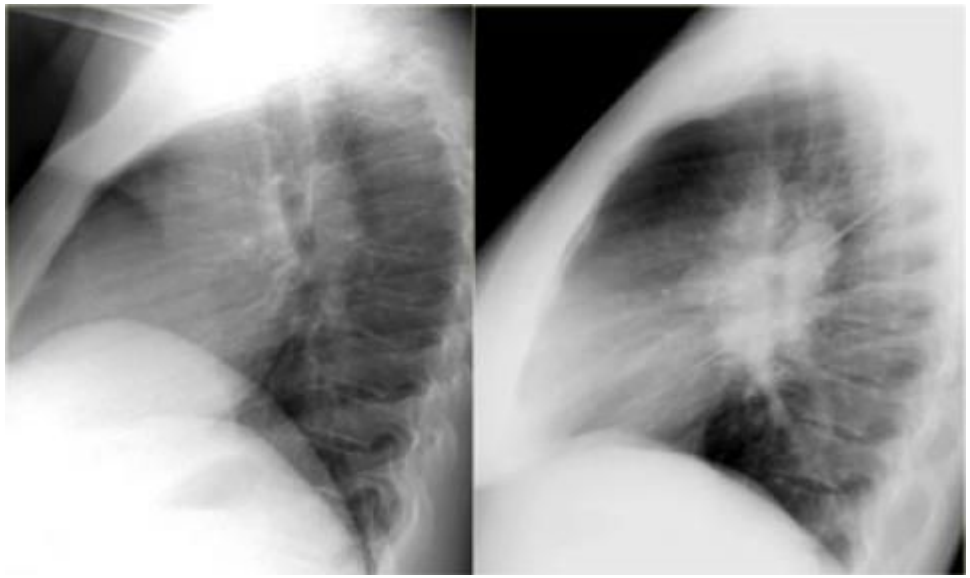


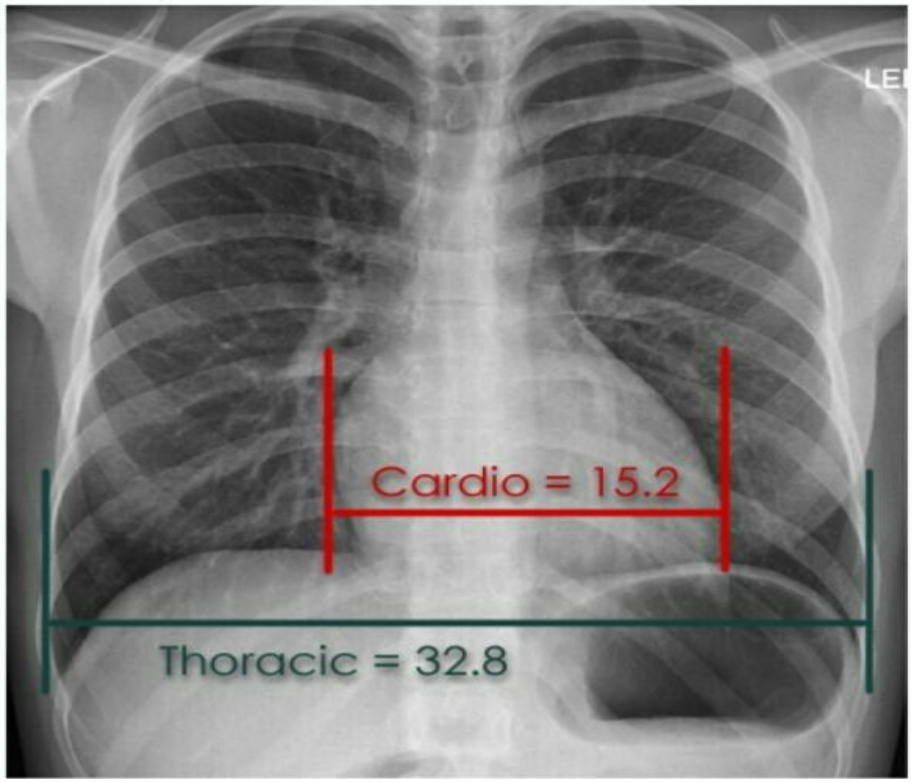
Hilum

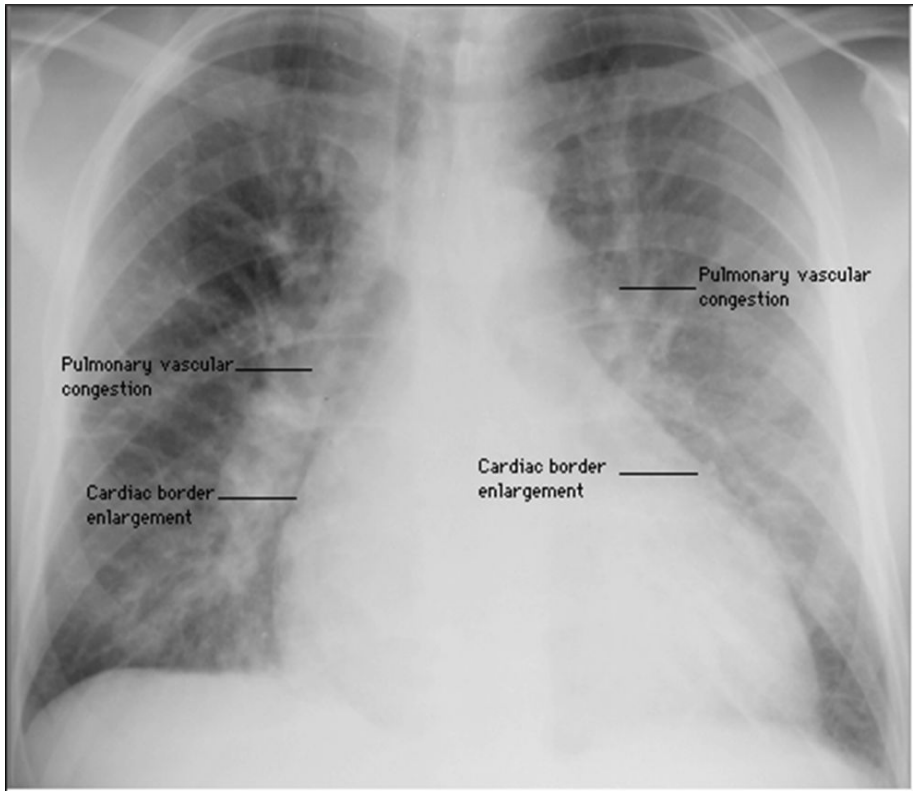

right paratracheal stripe
Aortic knob
Pulmonary trunk
interlobar artery
Left atrial appendage
Para-aortic line
right atrium
azygo-esophageal recess
Left ventricle
Paraspinal line

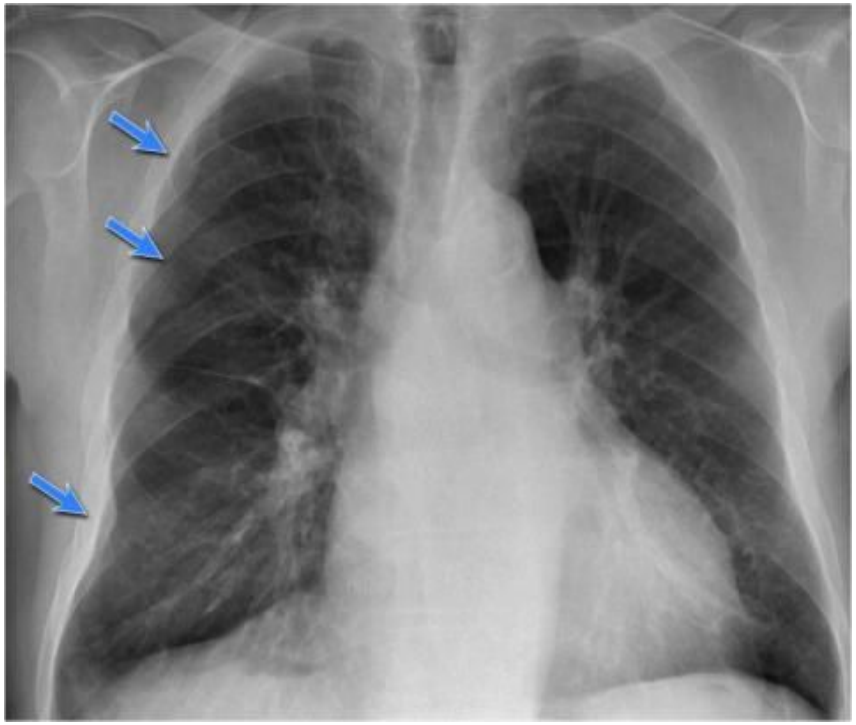

Normal hilar position
Hover over image to show findings
Right hilar point
Left hilar point





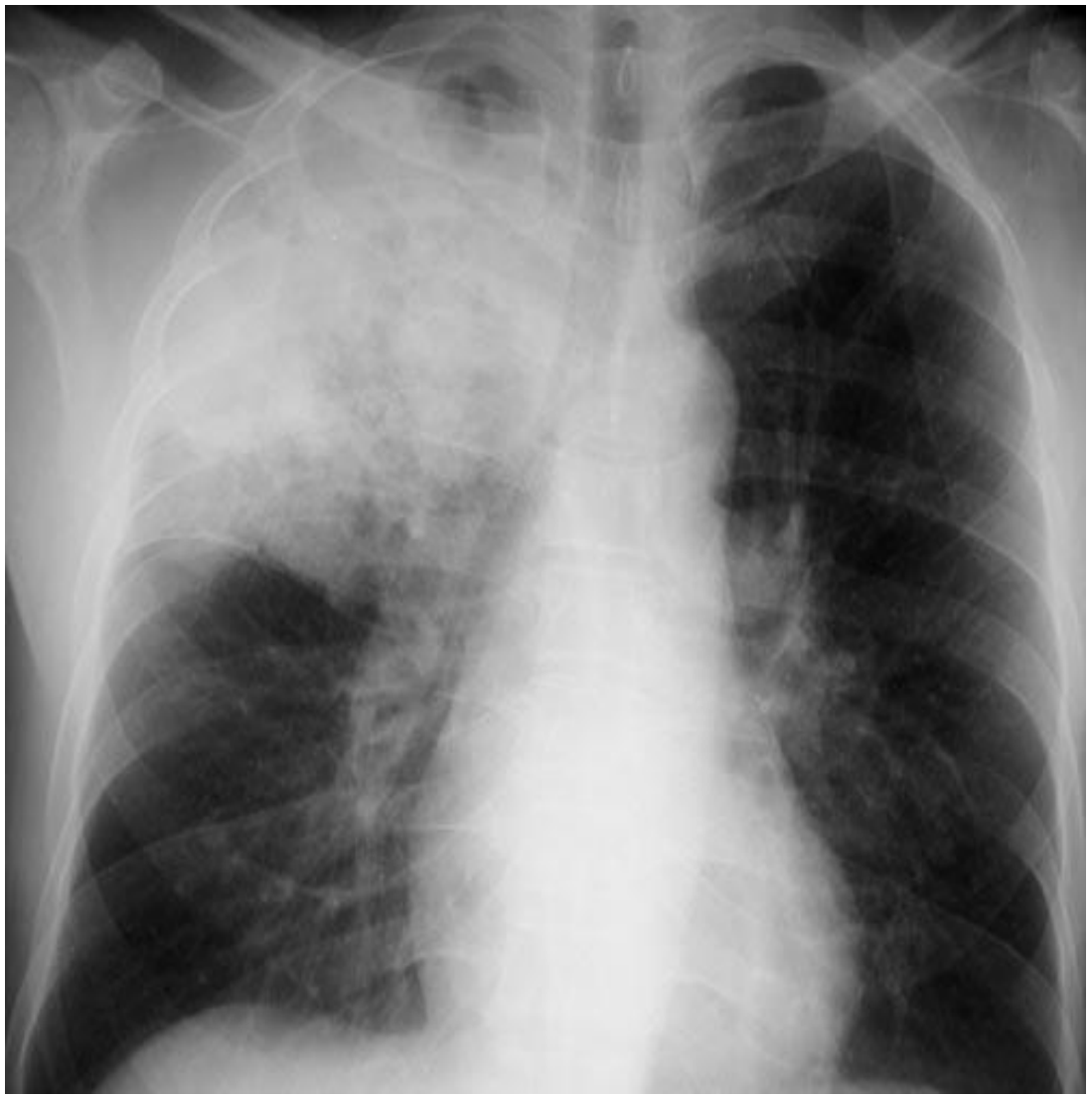

Cardio = 15.2
Thoracic = 32.8

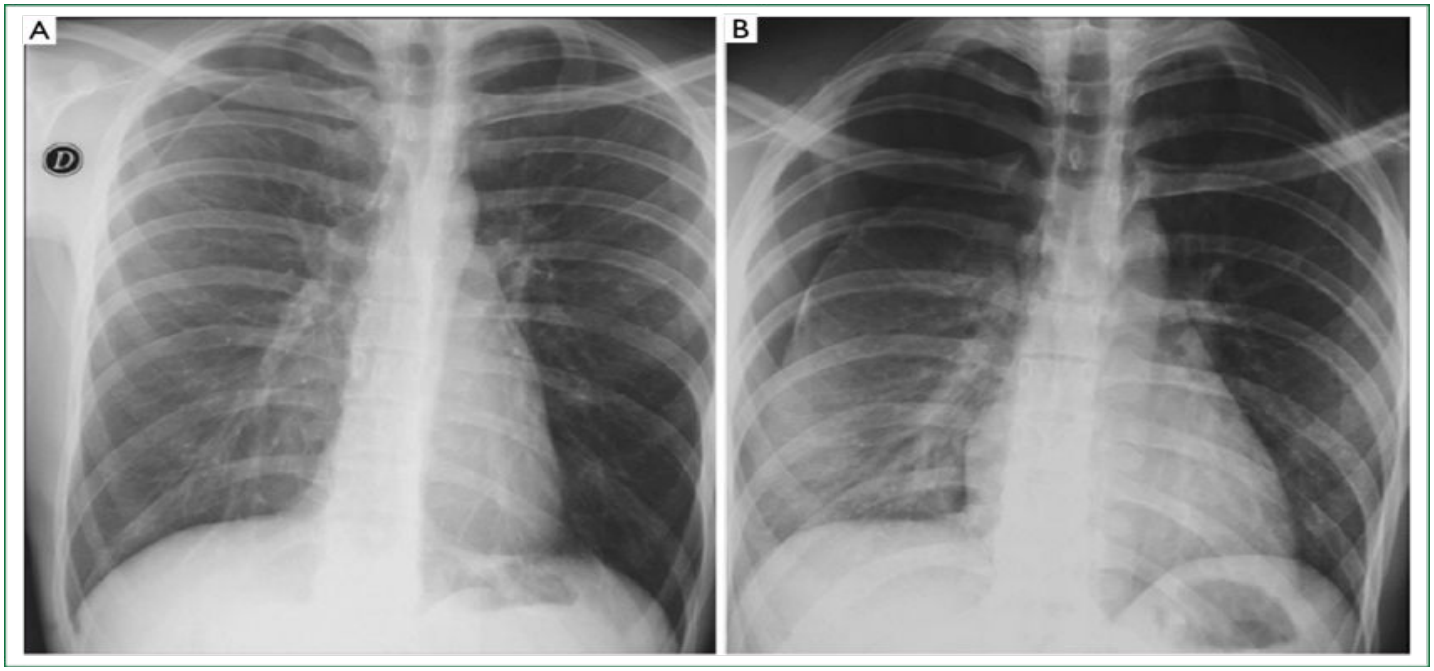

Pulmonary vascular congestion
Pulmonary vascular congestion
Cardiac border enlargement
Cardiac border enlargement

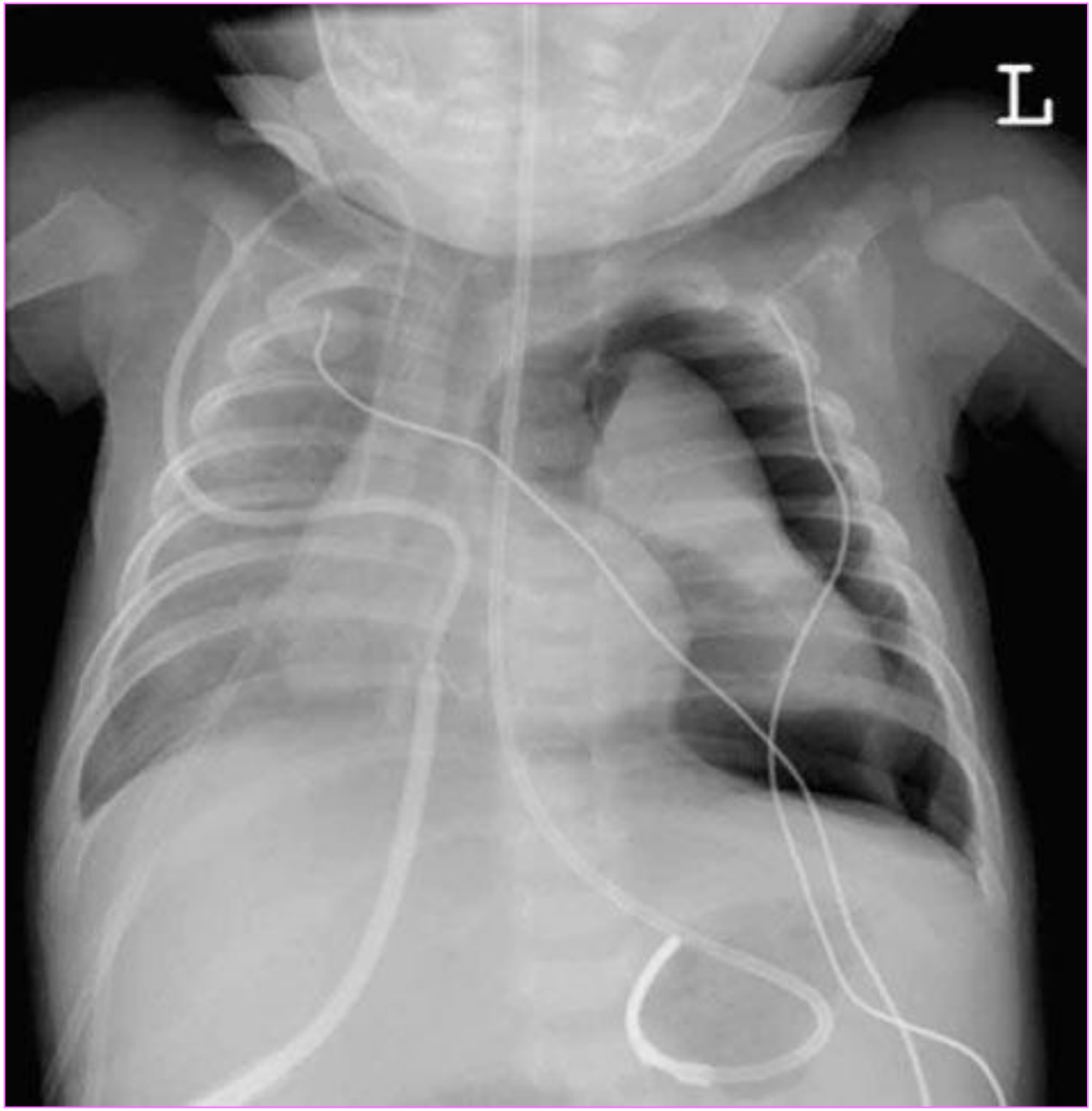


R

Exercise




A
B
D


L

A

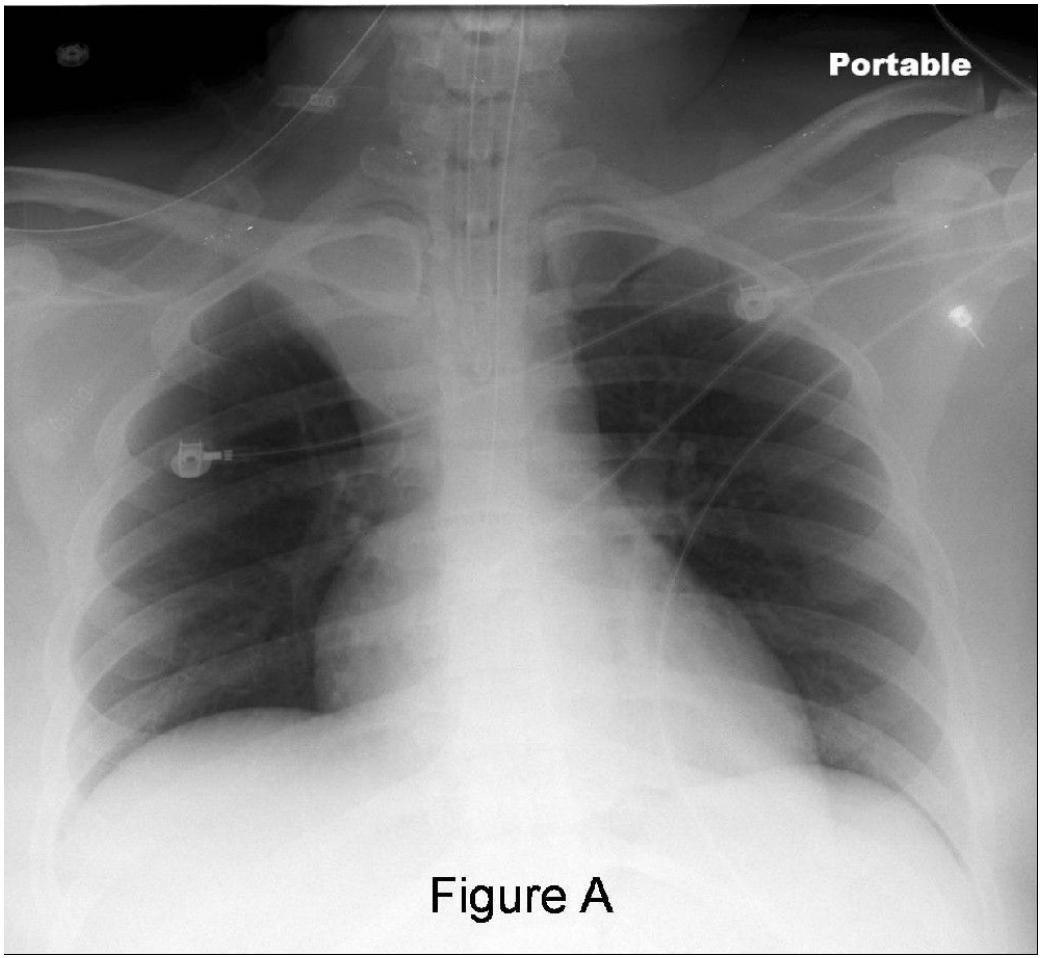


Figure A

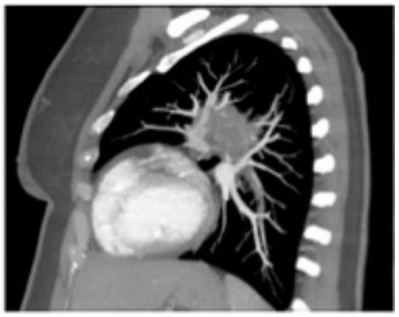
L
T21

Chest CT interpretation

Terms…
axial, coronal, sagittal

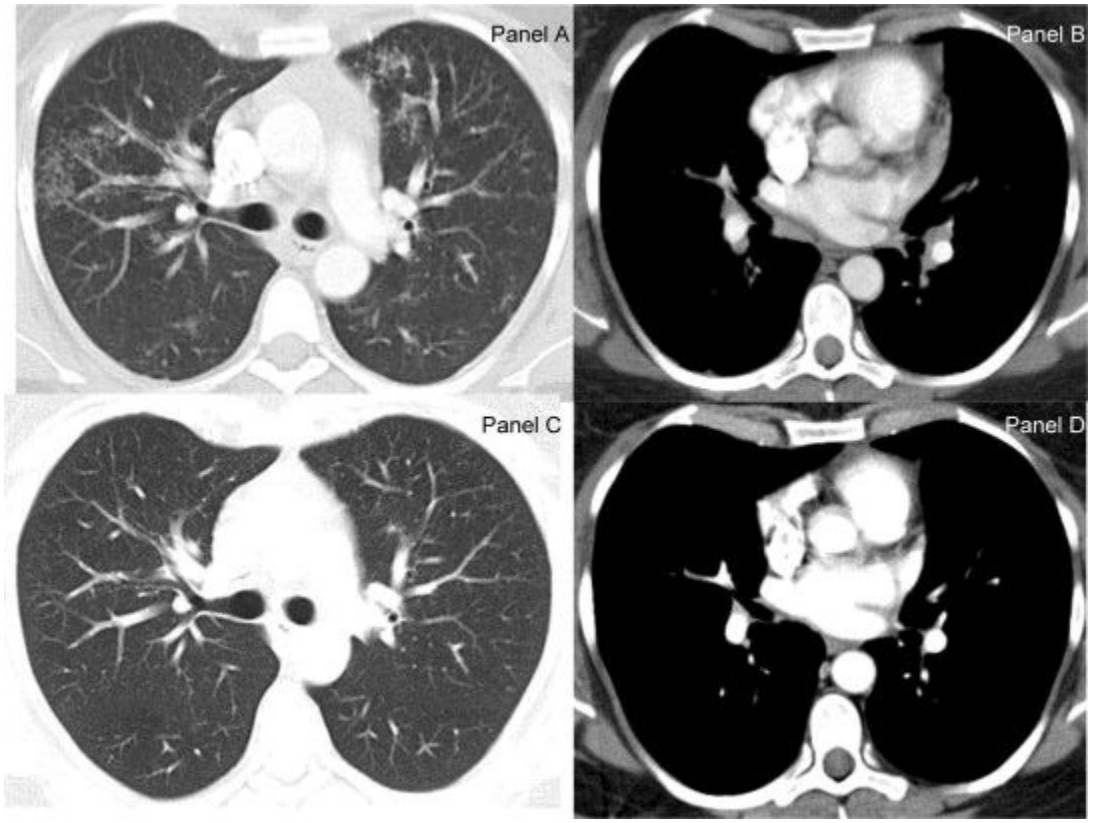
Axial view
Top to bottom

Coronal view
Front to back

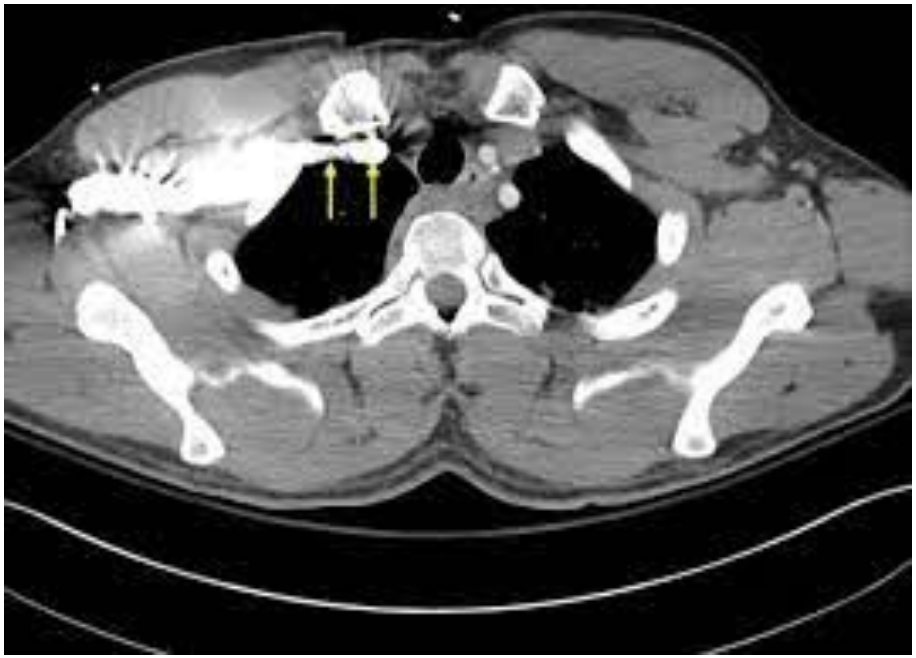


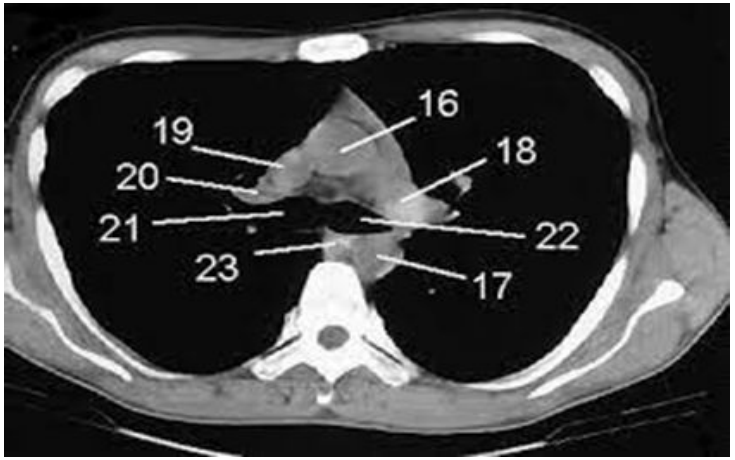
Sagittal view
Side to side

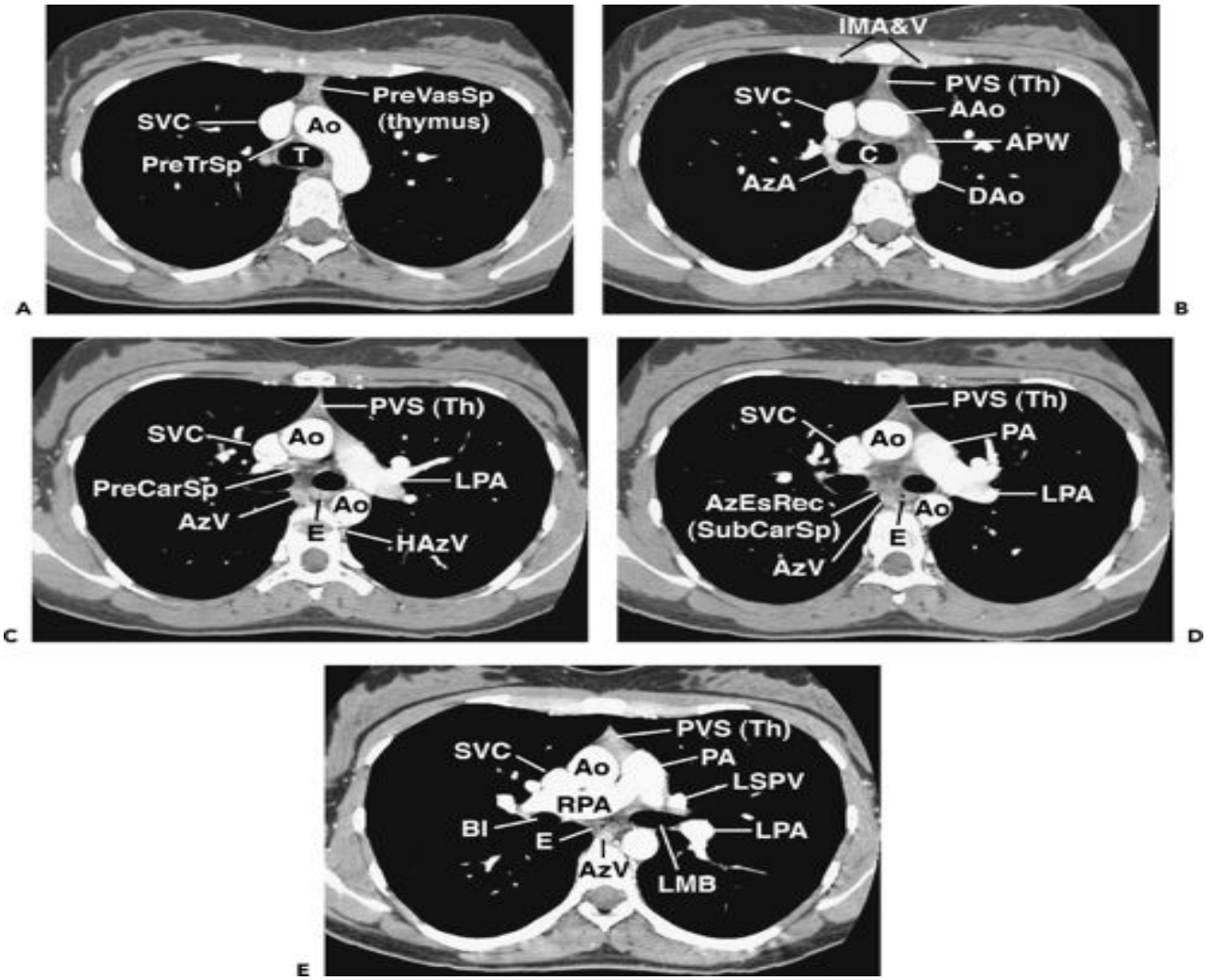
Terms …
Mediastinal and lung window

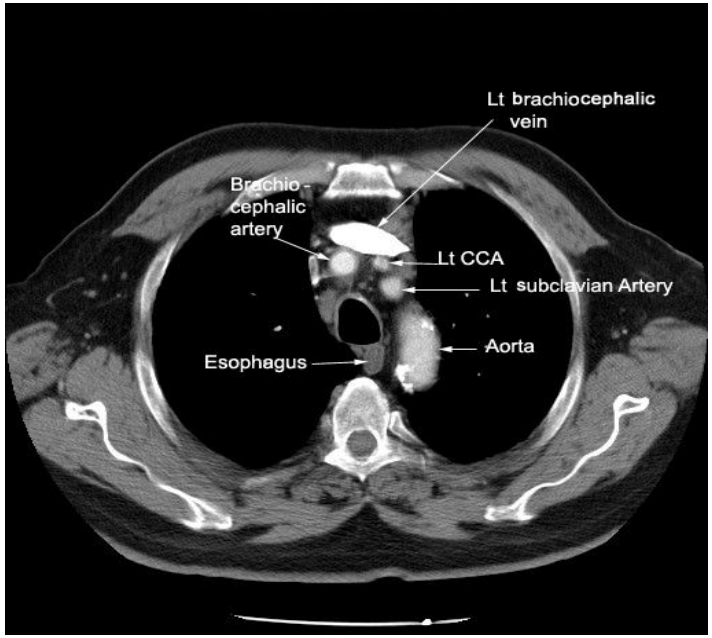


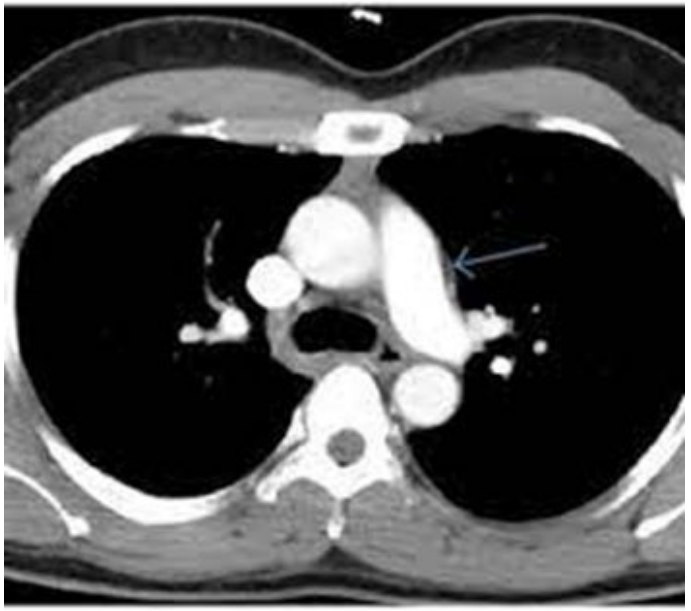
Ct chest with contrast

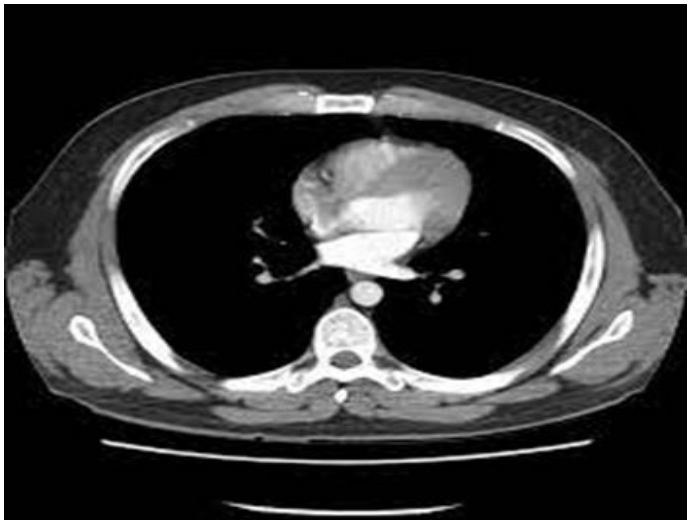


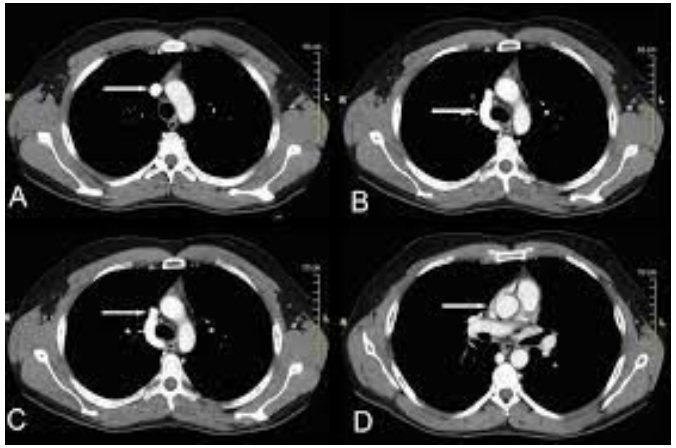


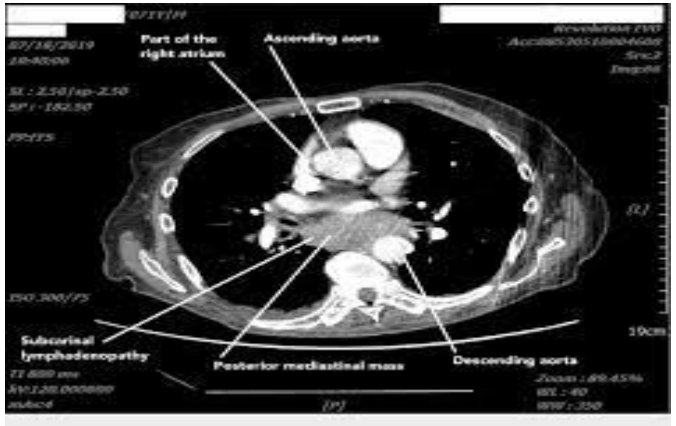

A
SVC
Ao
PreVasSp
(thymus)
PreTrSp
T
B
IMA&V
SVC
PVS (Th)
AAo
APW
C
AzA
DAo
C
PVS (Th)
SVC
Ao
LPA
PreCarSp
Ao
AzV
E
HAzV
D
SVC
PVS (Th)
Ao
PA
LPA
AzEsRec
(SubCarSp)
Ao
E
AzV
E
PVS (Th)
SVC
Ao
PA
LSPV
RPA
BI
LPA
E
AzV
LMB

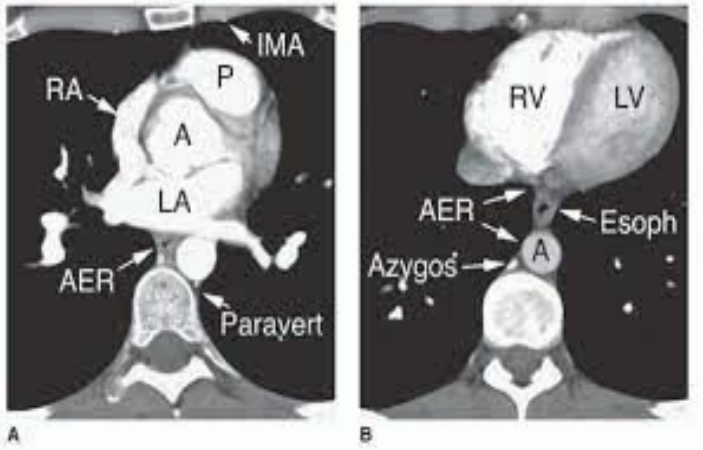

Lt brachiocephalic vein
Brachio cephalic artery
Lt CCA
Lt subclavian Artery
Aorta
Esophagus



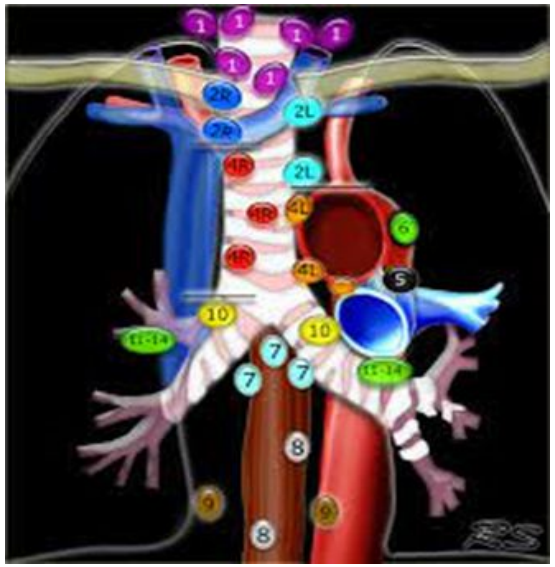


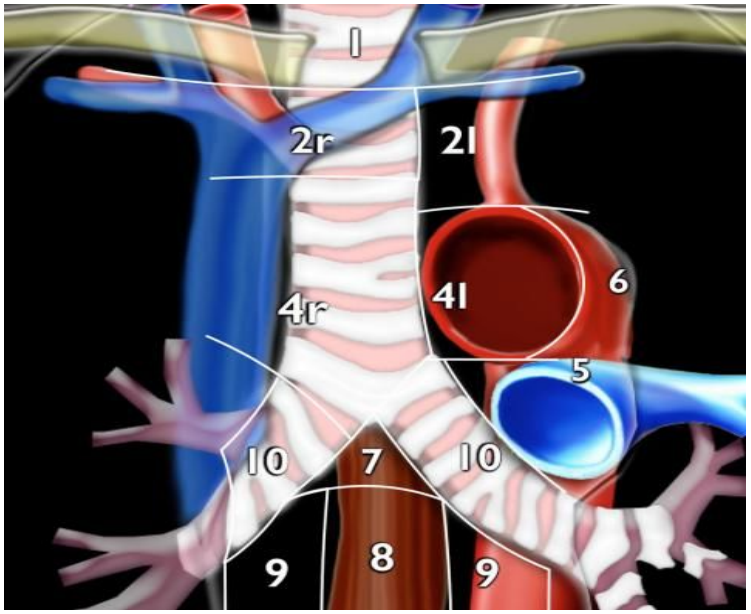

A
B
C
D

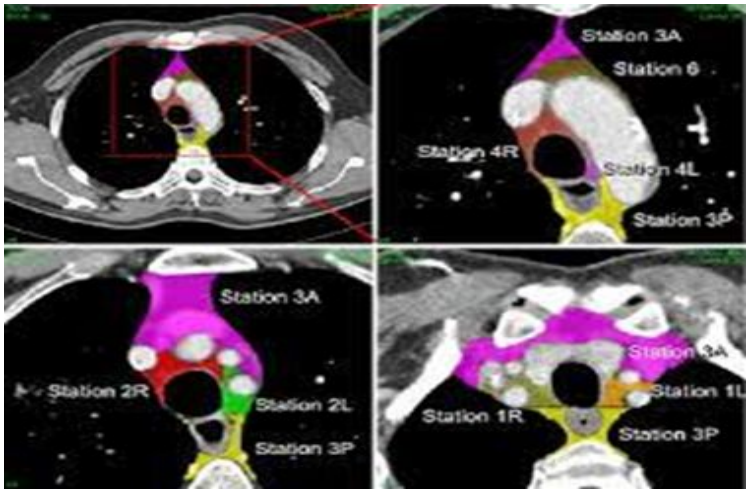

Part of the right atrium
Ascending aorta
Subcarinal lymphadenopathy
Posterior mediastinal mass
Descending aorta

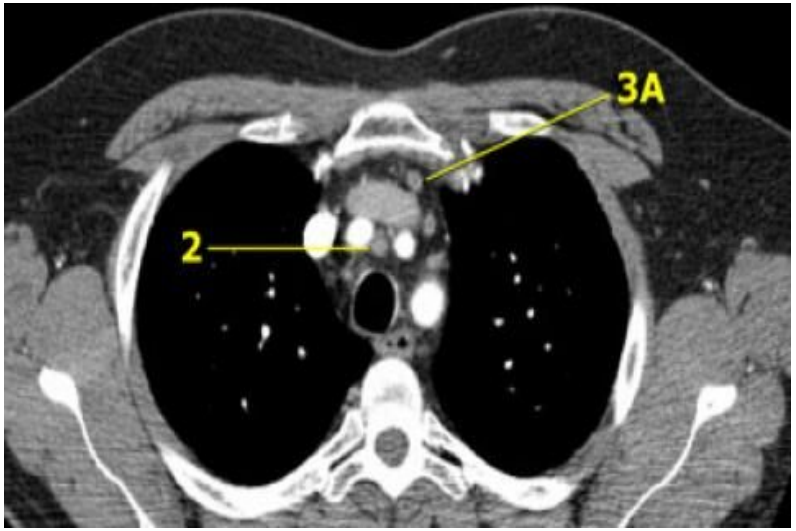

IMA
P
RA
A
LA
AER
Paravert
A
RV
LV
AER
Esoph
Azygos
A
B

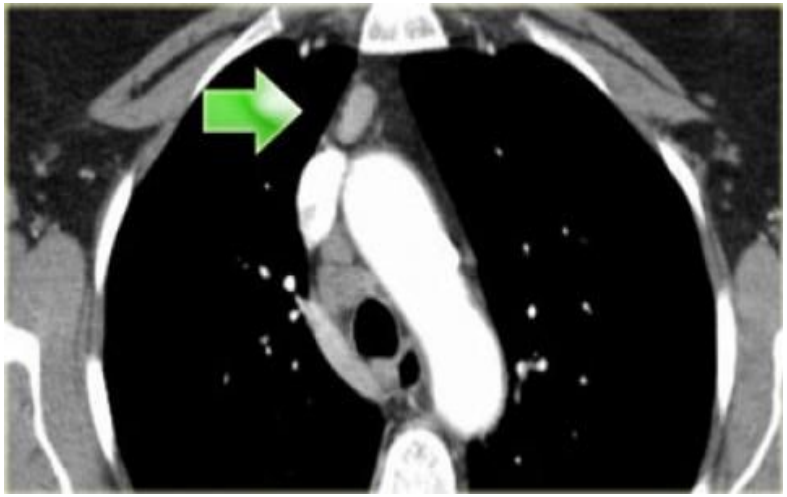
IASLC lymph node map.

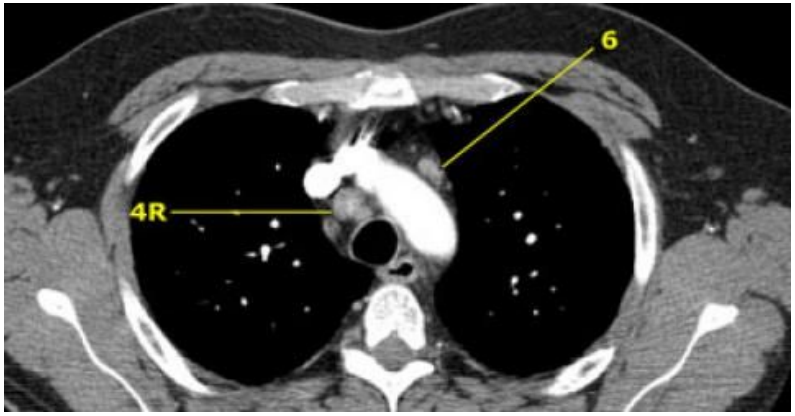


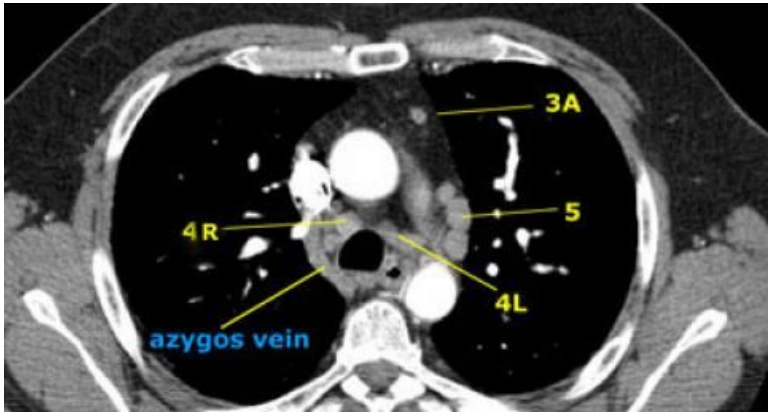


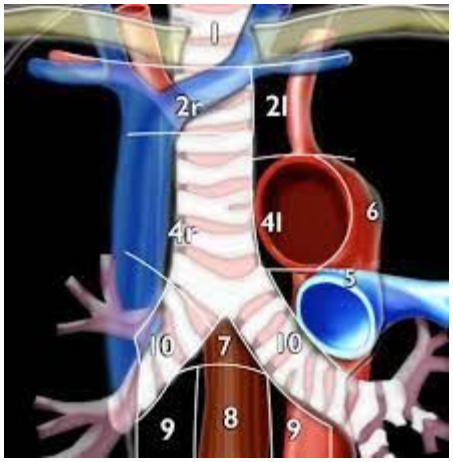


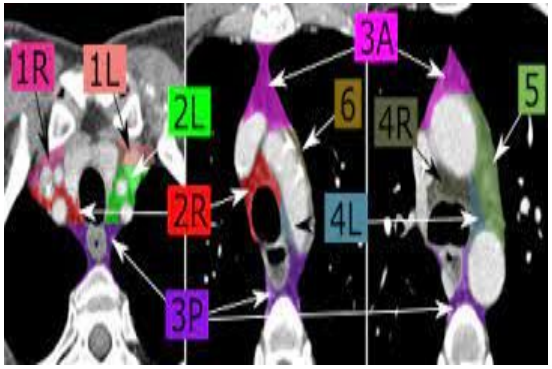

3A
2

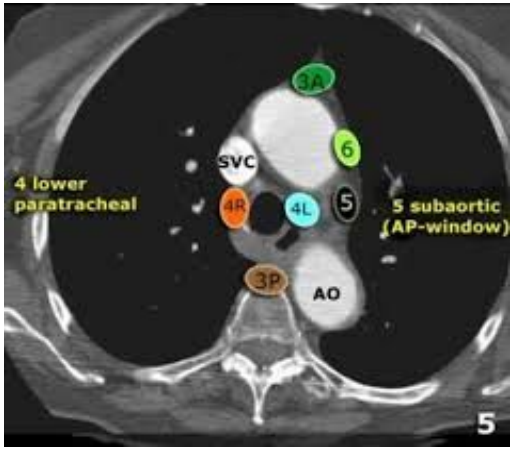


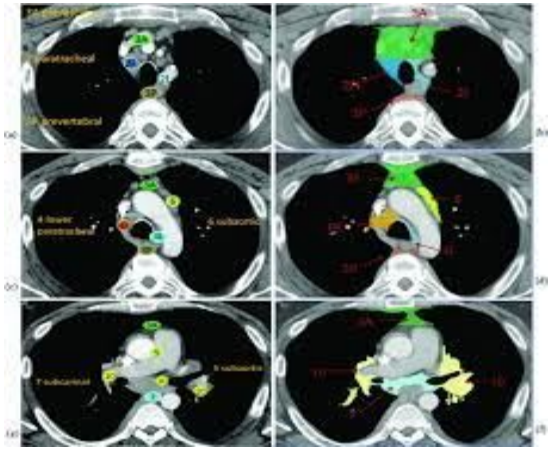

6
4R

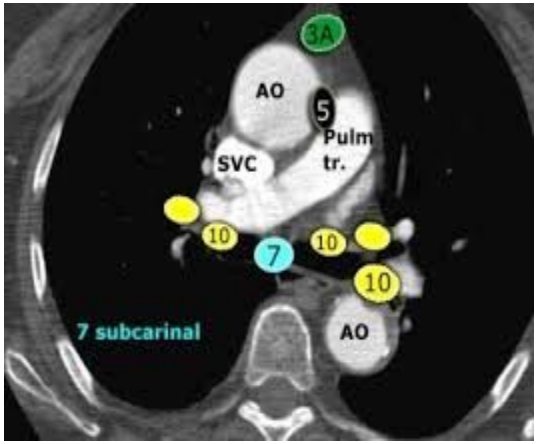

3A
4R
5
4L
azygos vein


1
2r
2l
4r
4l
6
5
10
7
10
9
8
9


1R
1L
2L
2R
3A
6
4R
4L
5
3P


3A
6
SVC
4 lower
paratracheal
4R
4L
5
5 subaortic
(AP-window)
3P
AO
5




3A
AO
5
Pulm
tr.
SVC
10
7
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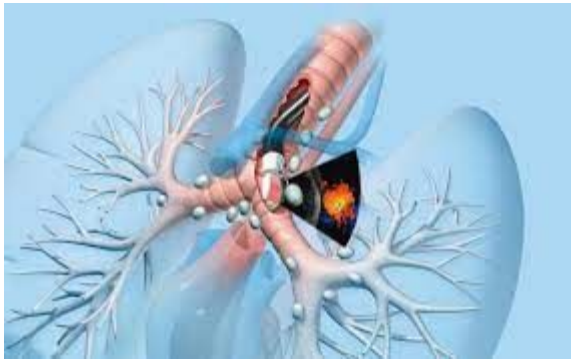
7 subcarinal
AO



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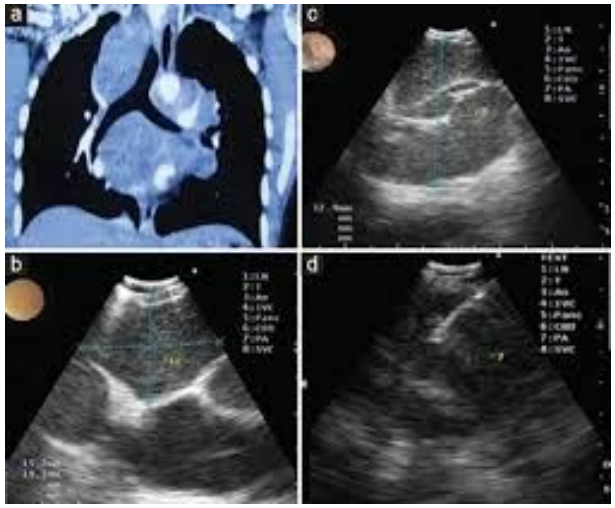
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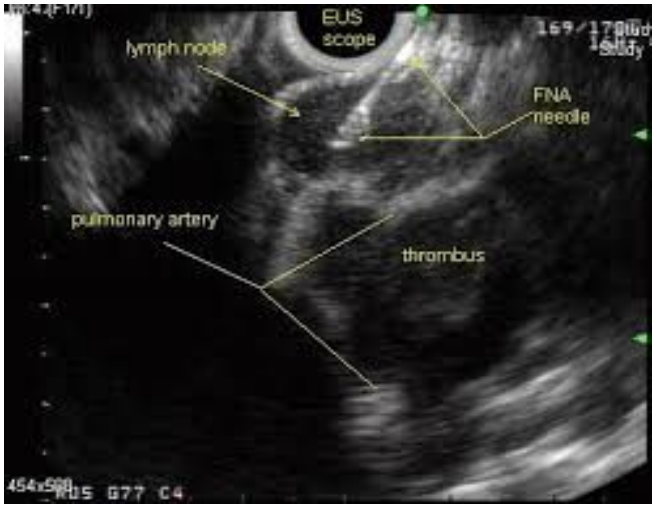
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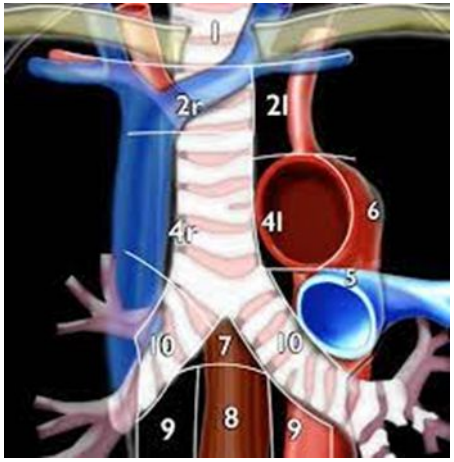
scope
lymph node
FNA
needle
pulmonary artery
thrombus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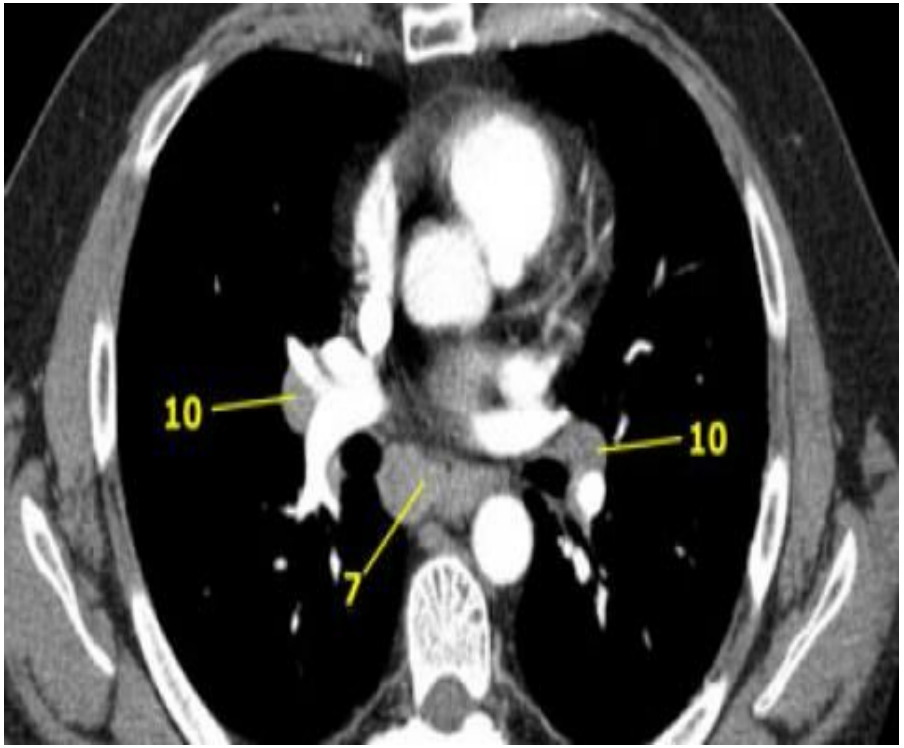
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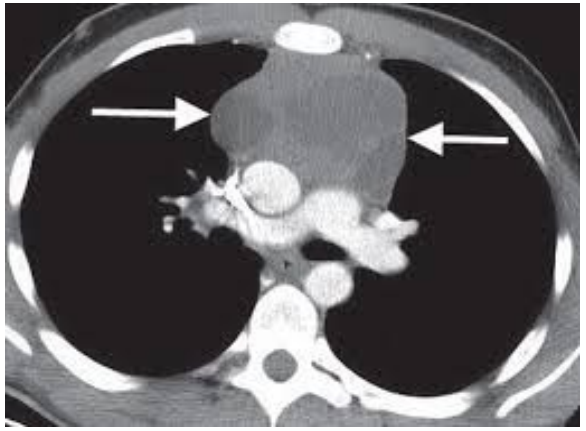
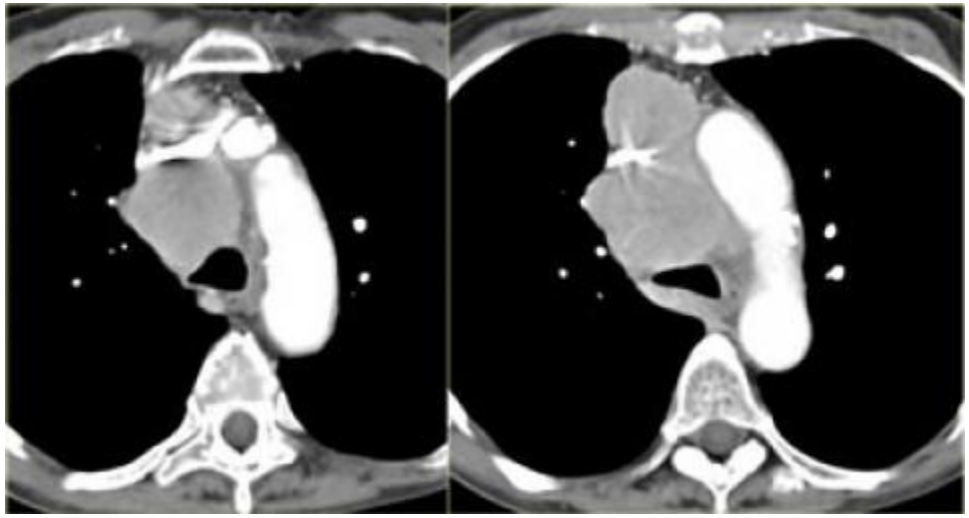
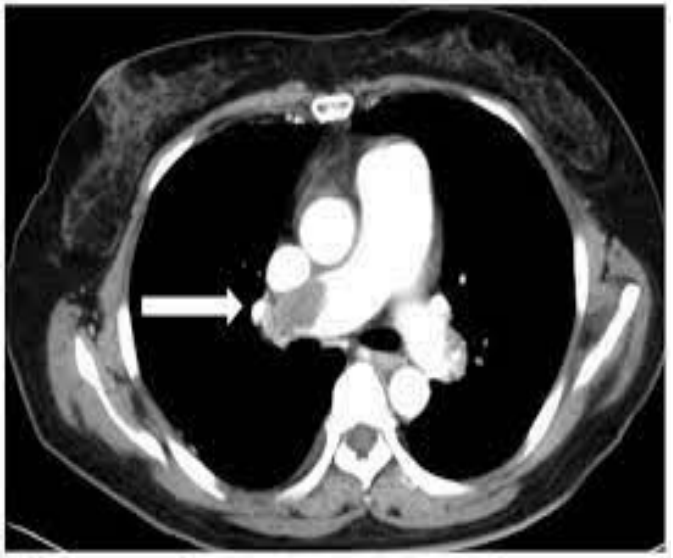
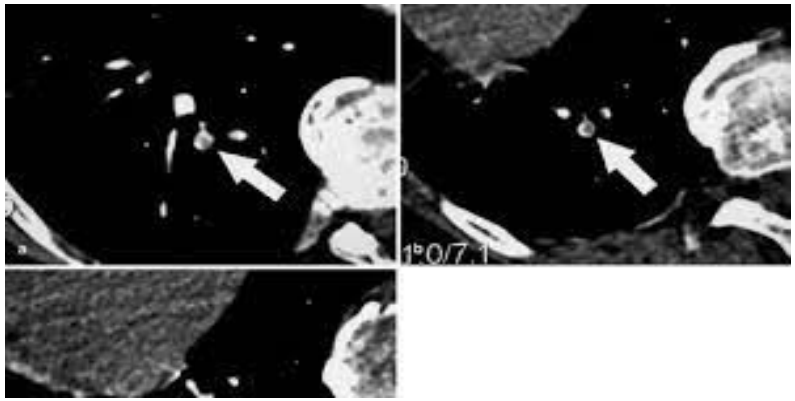
H-SP-CR







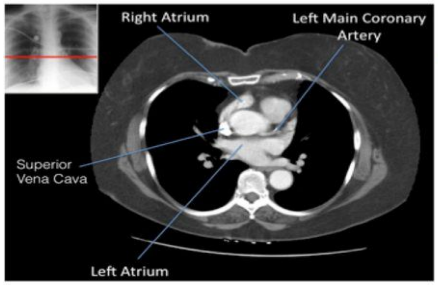


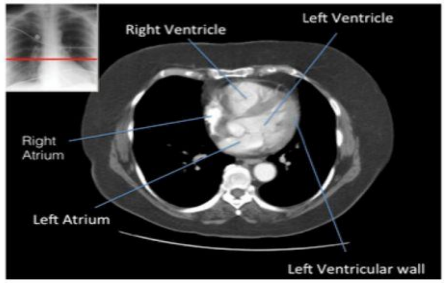
8t66

Atria Region

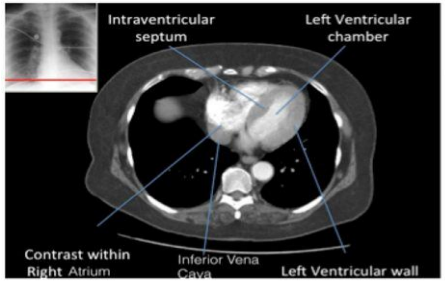
Located within this region are the

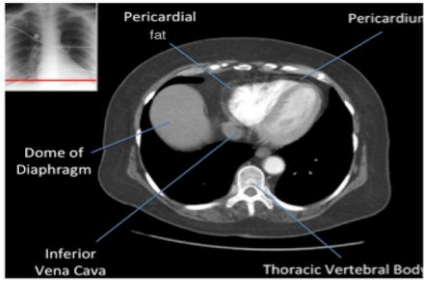
- *Atria*
- *Coronary Arteries*
- *The superficial aspects of the Ventricles*





Ventricular Region

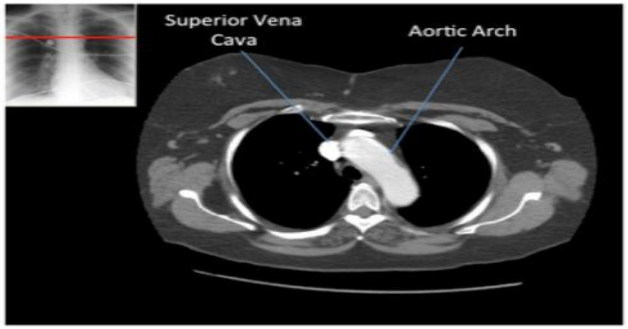




Located within this region are the

- *Ventricles*
- *Interventricular Septum*
- *Pericardium*
- *Pericardial Sac*
- *Dome of Diaphragm*

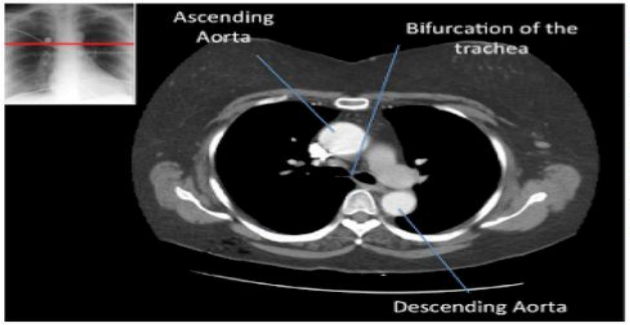
Aortic Arch Region



Located within this region are:

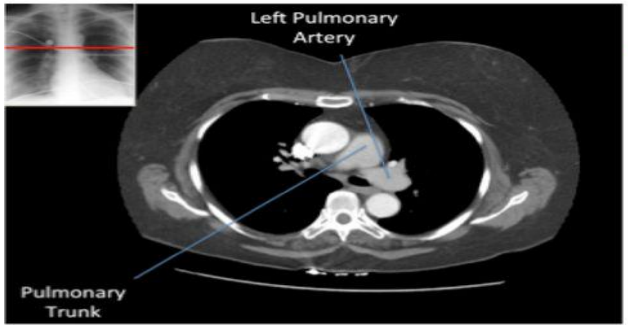
- *Superior Vena Cava*
- *Aortic Arch*

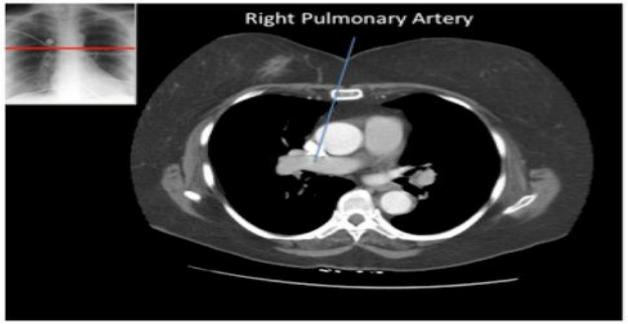
Carina and Pulmonary Vessel Region



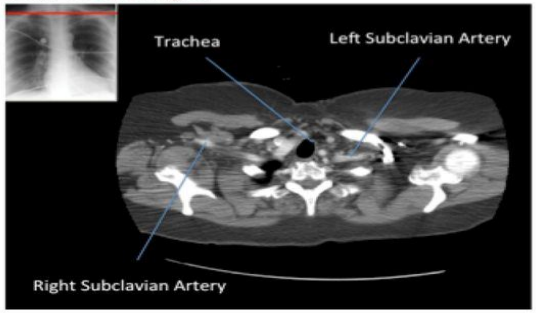
Located within this region are the:

- *Ascending and Descending Aorta*
- *Bifurcation of the trachea*
- *Aortic Arch*
- *Pulmonary Arteries*
- *Pulmonary Trunk*



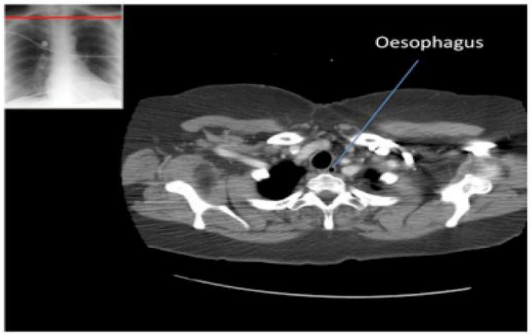


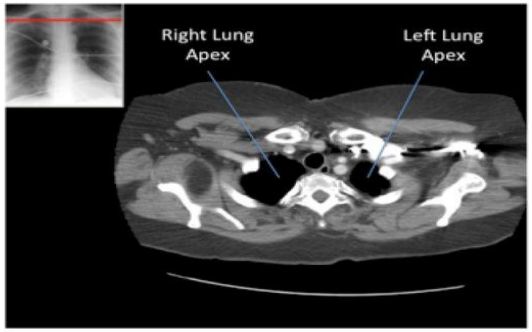
Great Vessels Region

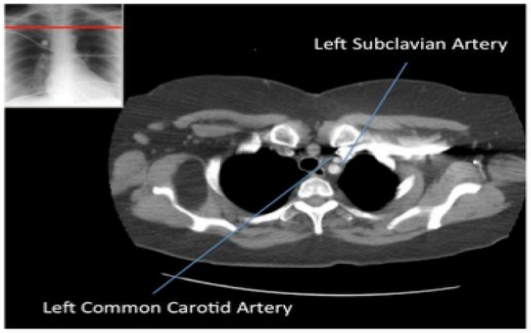


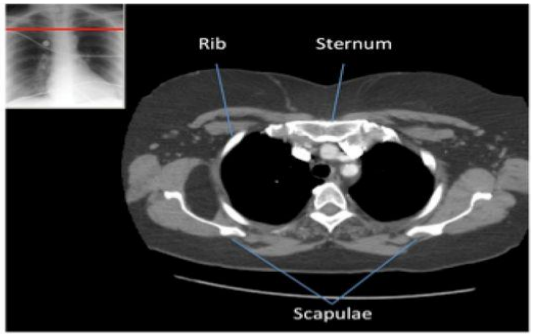
Located within this region are the:

-trachea
-oesophagus
-subclavian vessels
-carotid vessels
-lung apices
-Boney structures



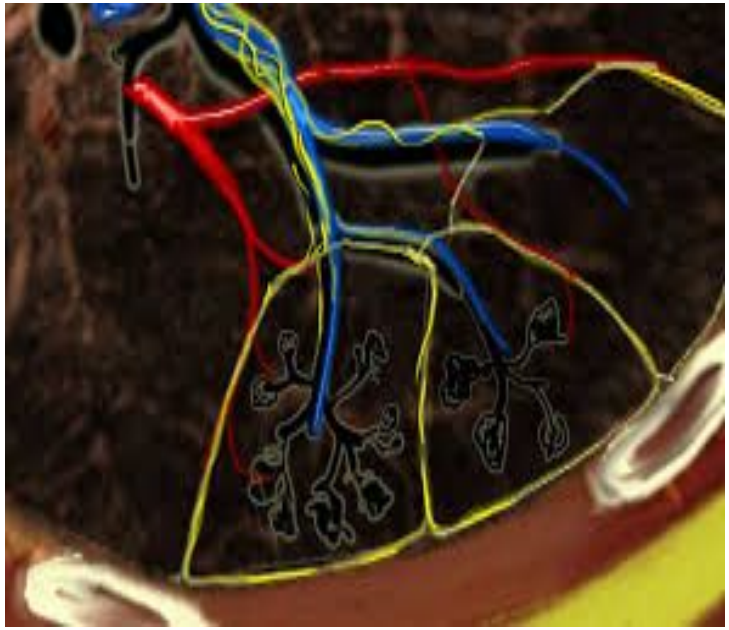


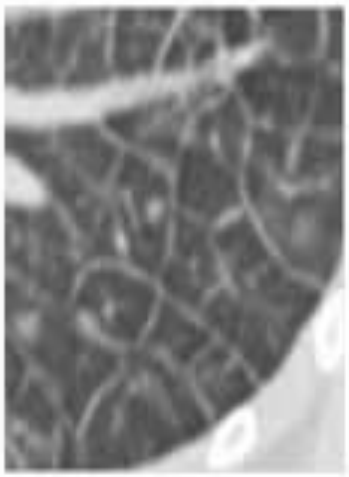


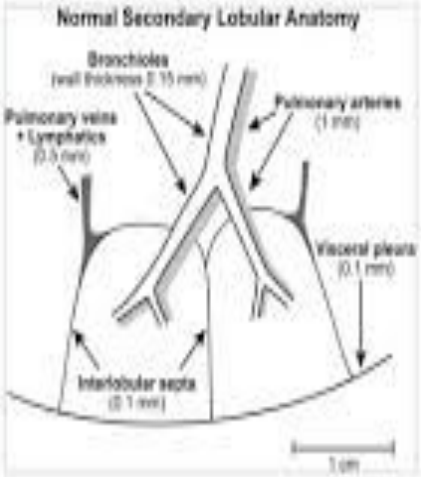


HRCT chest

Secondary pulmonary lobule







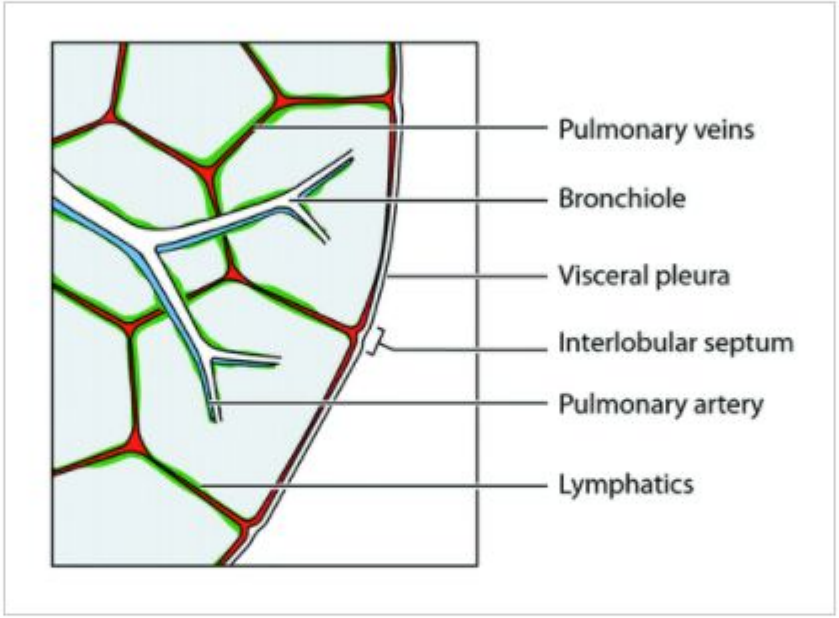
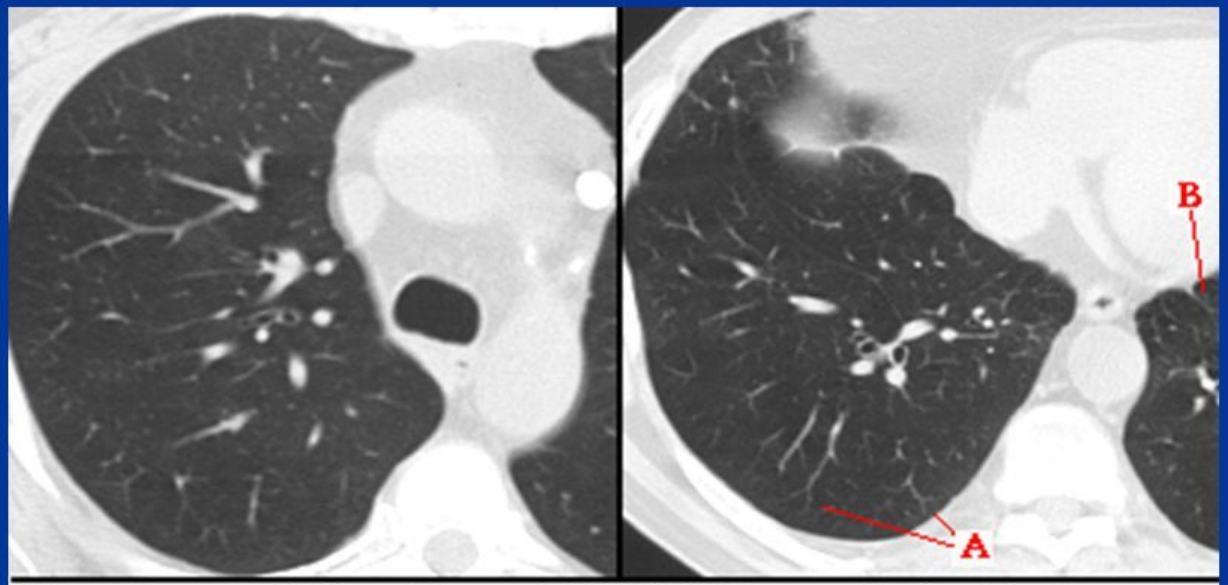


Fig. 1. —Line drawing of a secondary pulmonary lobule. Borders of lobule are interlobular septa. At center of each lobule is a bronchiole and a pulmonary artery (*blue*). Pulmonary vein (*red*) run in interlobular septa. Lymphatics (*green*) are found in interlobular septa and in central or axial interstitium that surrounds bronchovascular bundles.

Normal HRCT

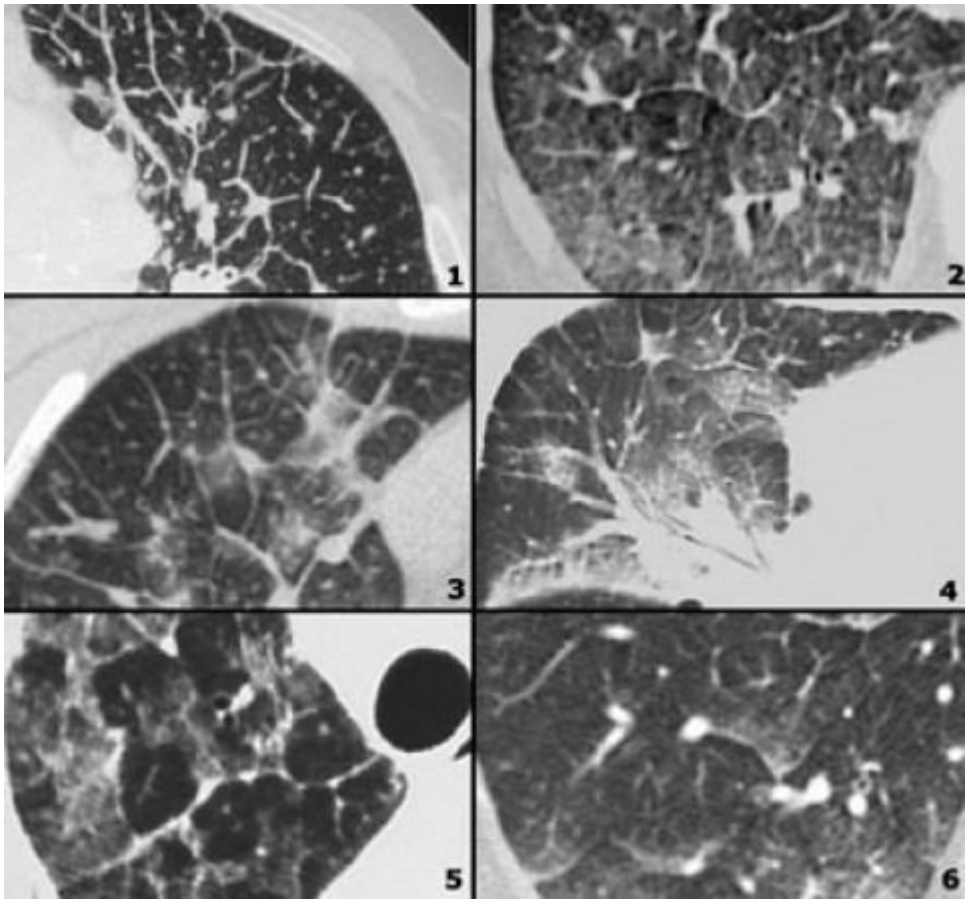


Normal upper (left) and lower (right) HRCT scans obtained in the prone position. The center of a pulmonary lobule is defined by the presence of a distal pulmonary artery (A). The faint outline of a distal interlobular septum is noted in the lower lobes (B). A subpleural clear space is normally present in the nondependent lung.

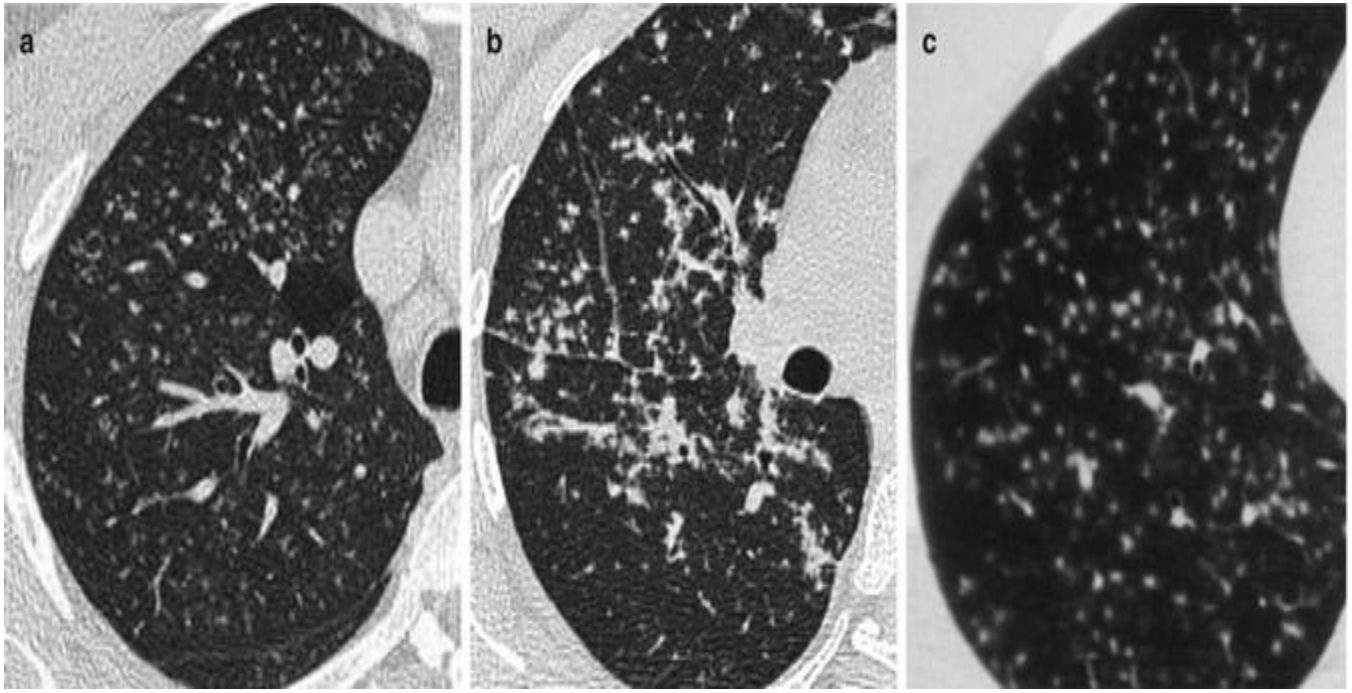
HRCT-Patterns

- Nodular pattern.
- Reticular pattern .
- Increased density (Consolidation, GGO).
- Decreased density (cystic pattern)

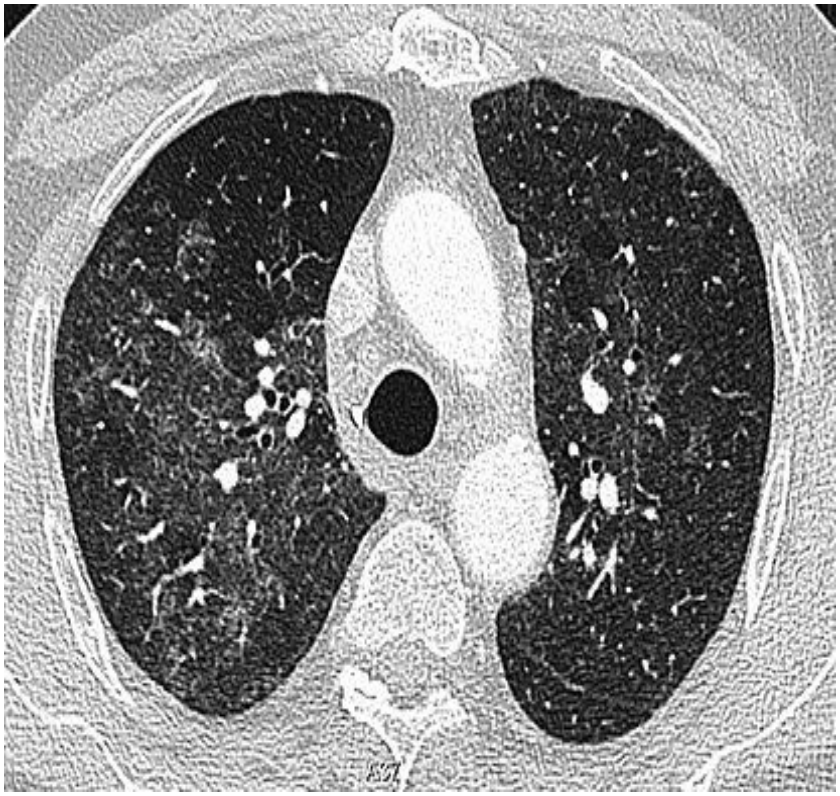
Reticular pattern

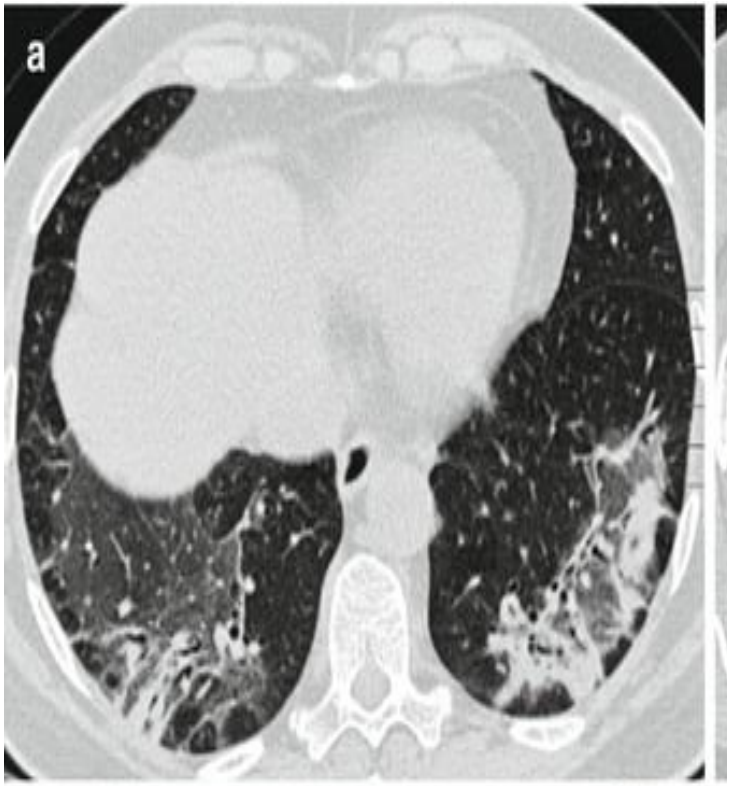


Nodular pattern

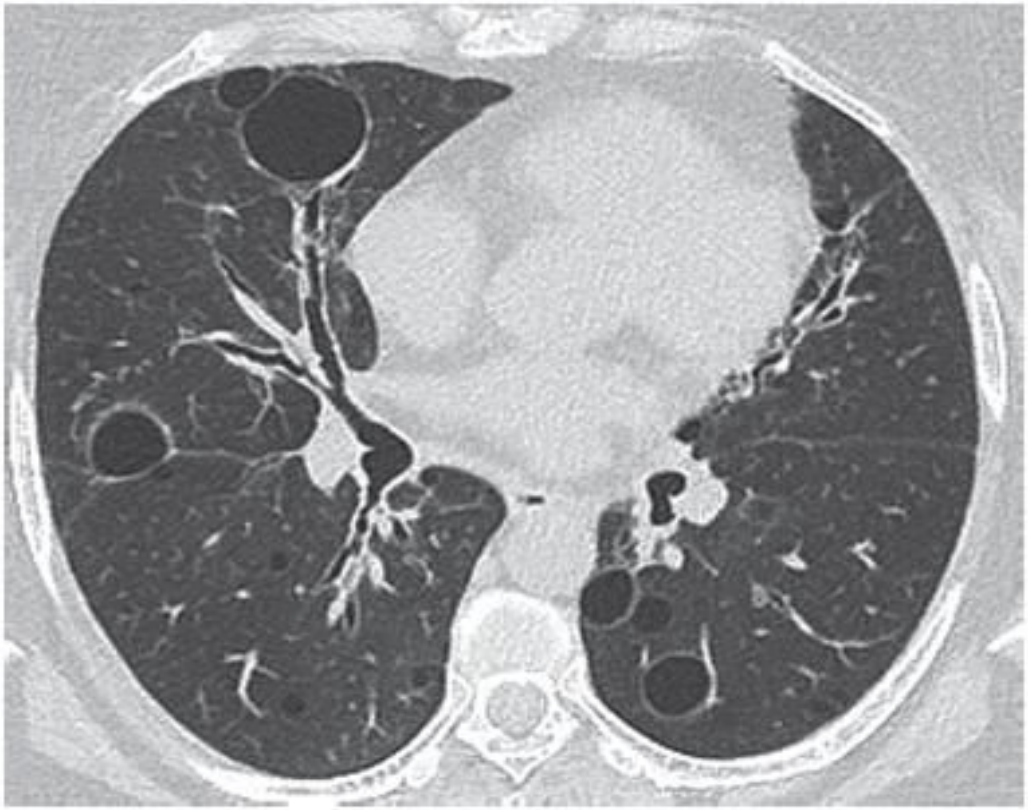


Ground glass opacity, Consolidation /Increased density





Cystic pattern /decreased density



Mosaic attenuation

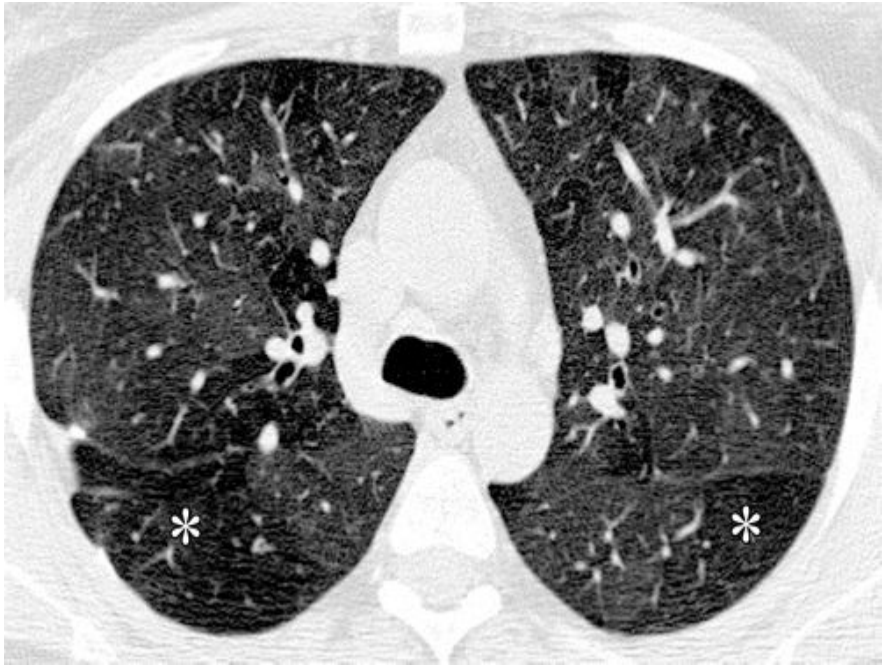
- is a descriptive term used in describing a patchwork of regions of differing pulmonary attenuation on CT imaging.
- Causes:

Obstructive small airways disease: air-trapping in lung areas with obstructive small airways disease, and reduced perfusion in these pathological areas secondary to vasoconstriction

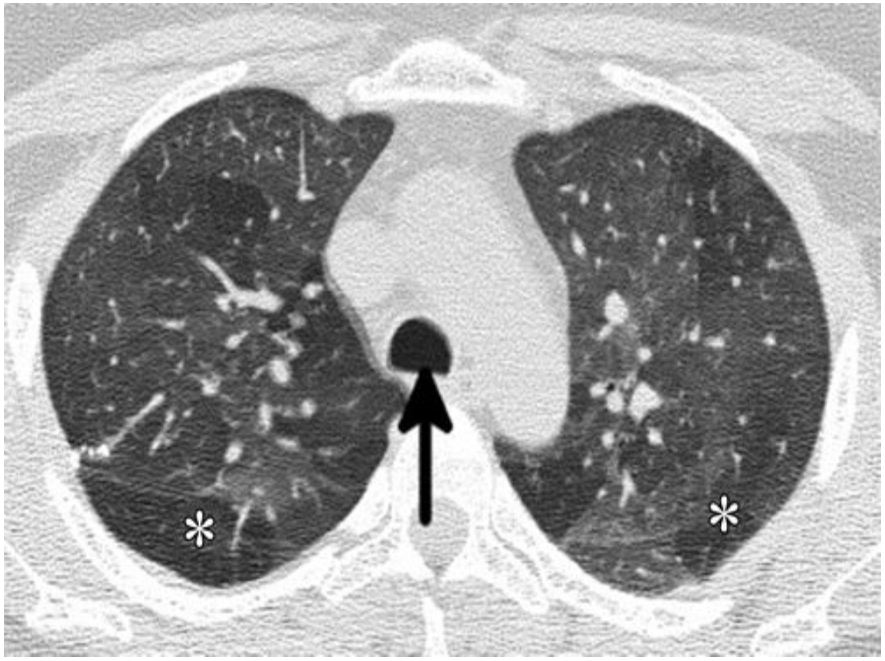
Occlusive vascular disease: low attenuation regions are abnormal and reflect relative oligemia

Mosaic attenuation

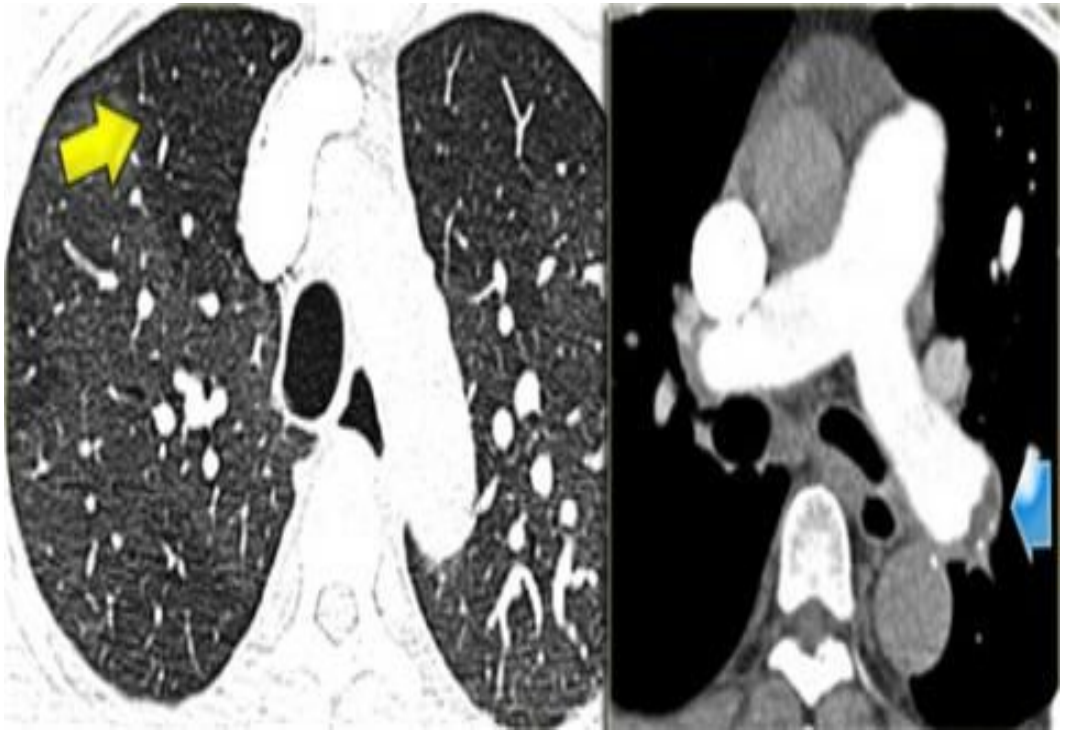
Inspiration

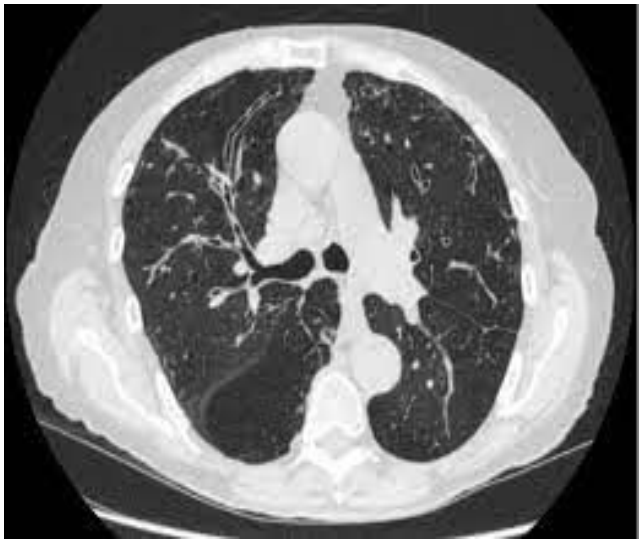


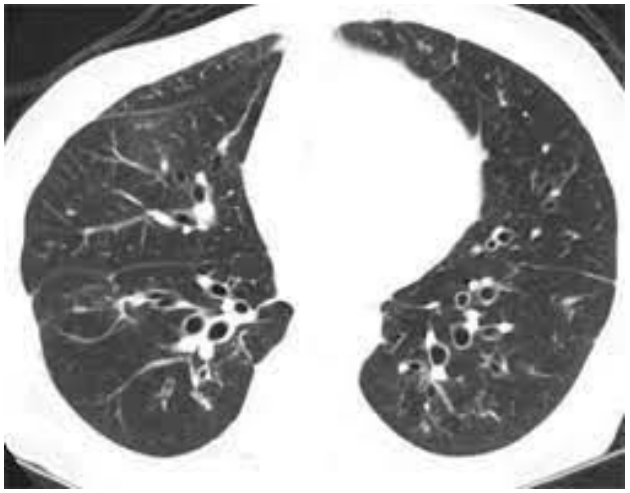
Expiration

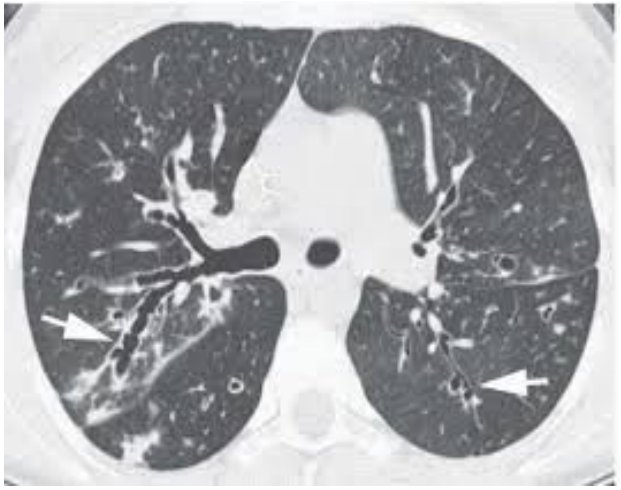


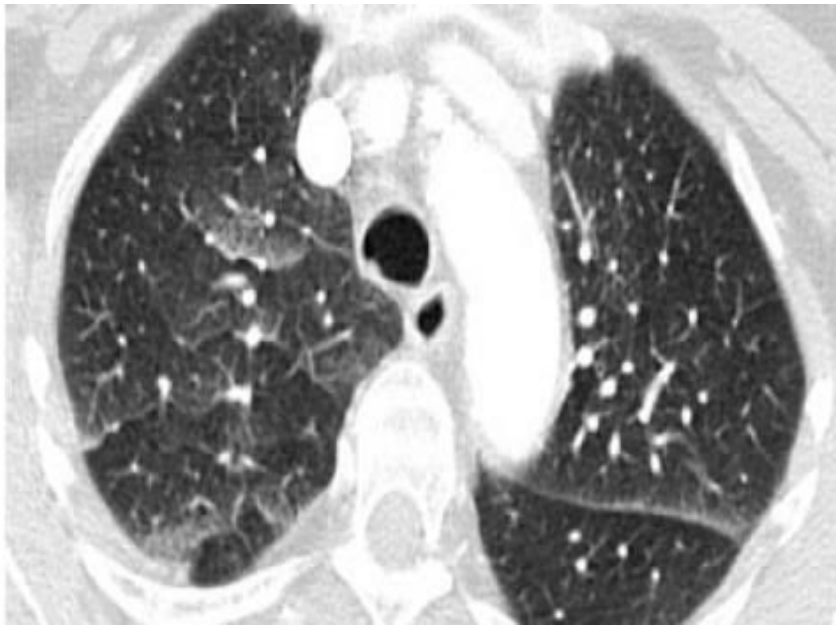
Mosaic attenuation

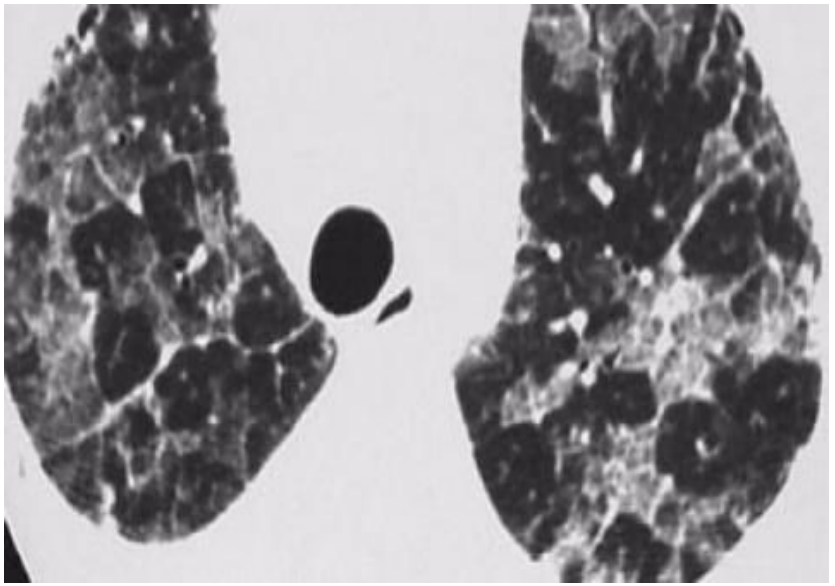


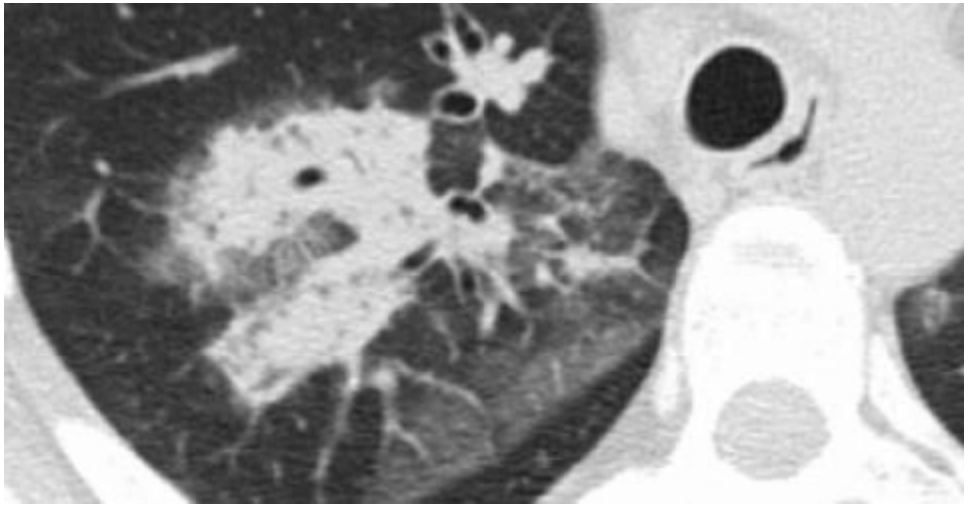




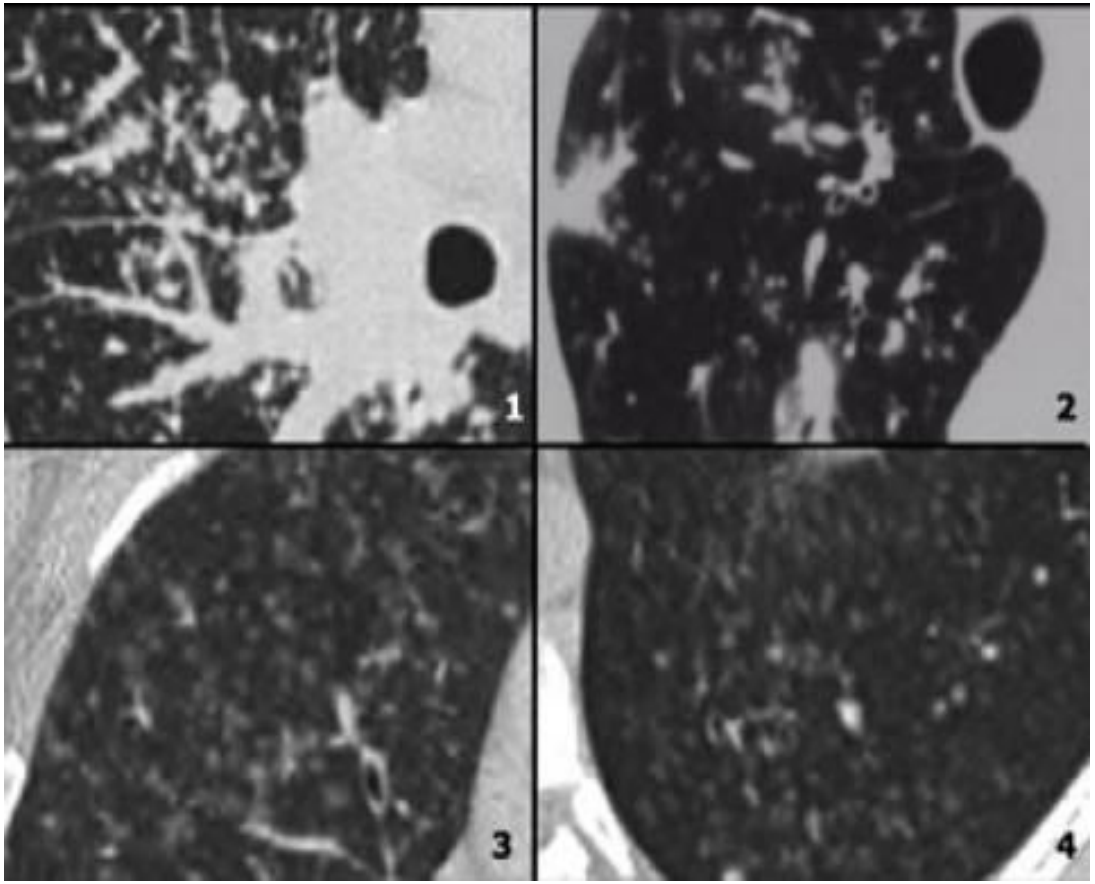








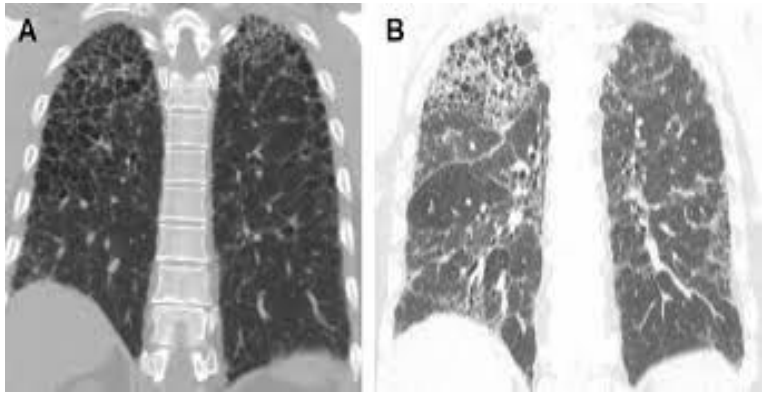
2 tree in bud



Lymphangitis carcinomatosis

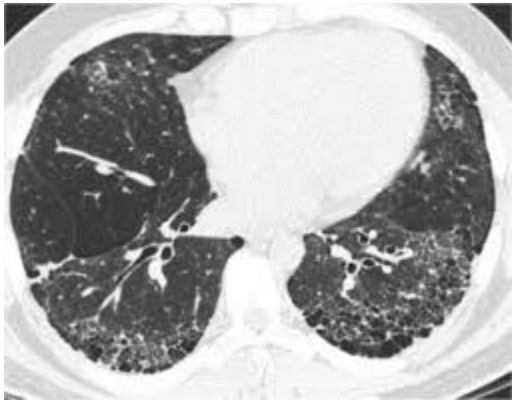
Asbestosis

Hypersensitivity pneumonitis



Congestive heart failure

Honeycombing
IPF

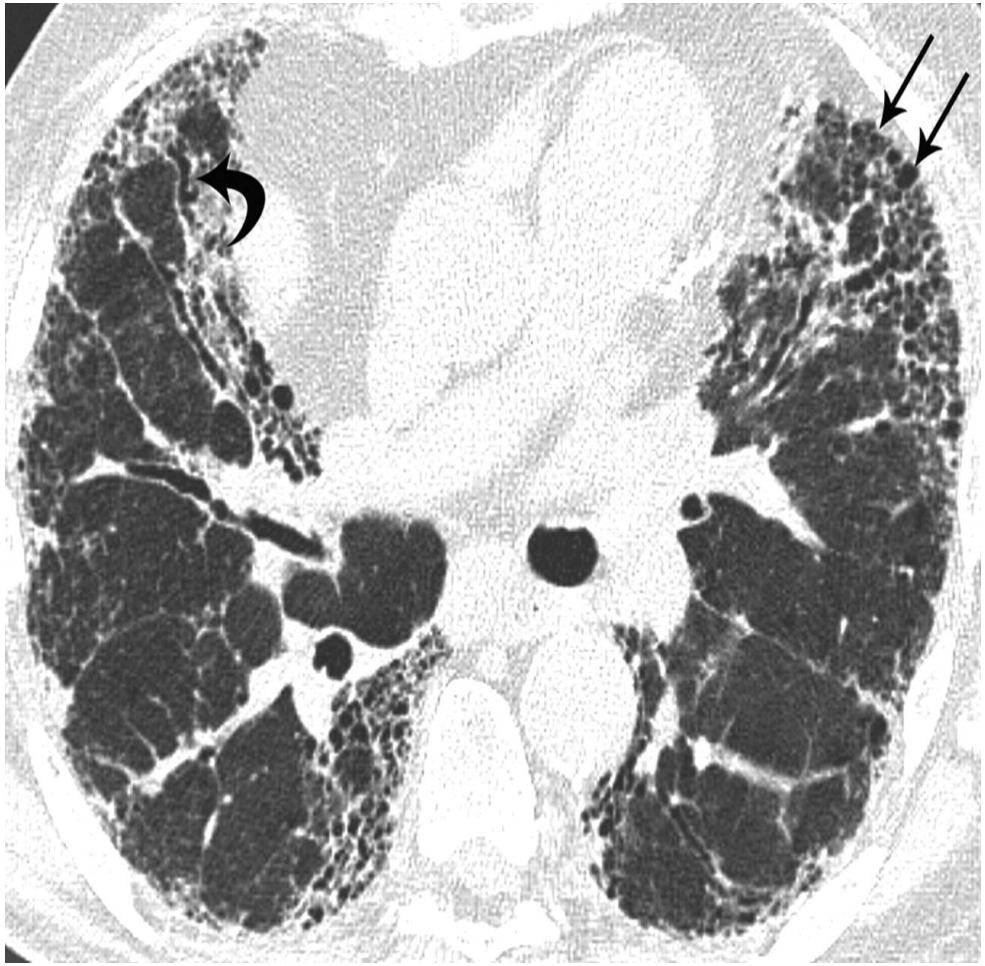


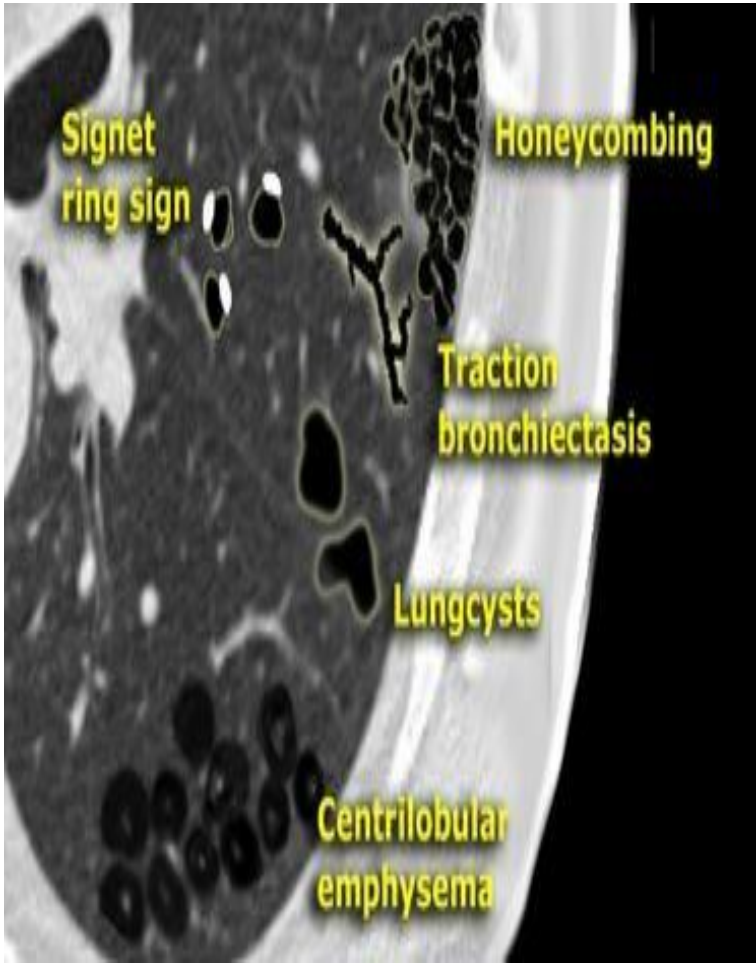
NSIP(nonspecific interstitial pneumonia)
GGO

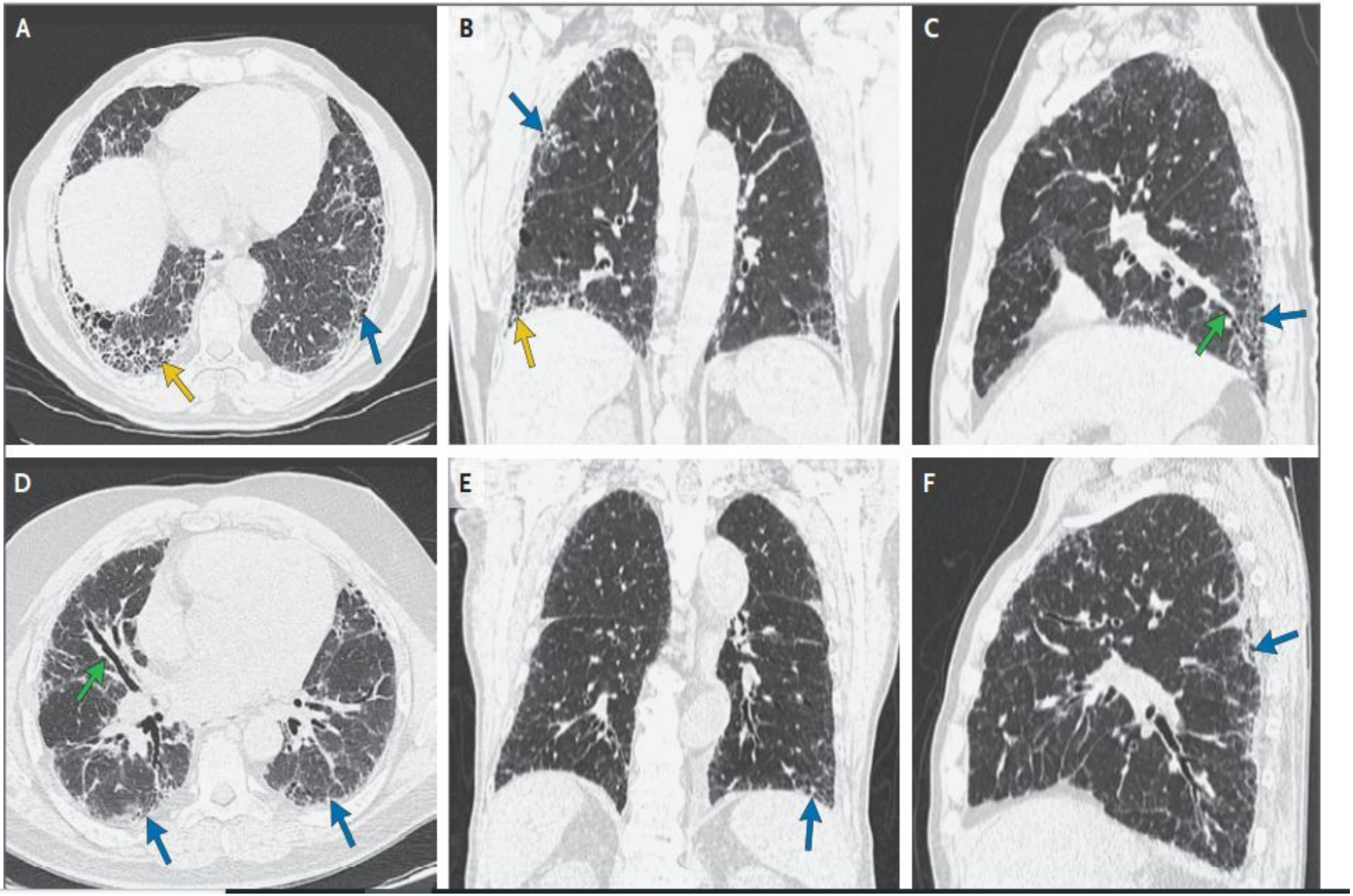
Diagnosis ?

Drug induced
Radiation induced

HRCT OF IPF




Signet
ring sign
Honeycombing
Traction
bronchiectasis
Lungcysts
Centrilobular
emphysema


A
B
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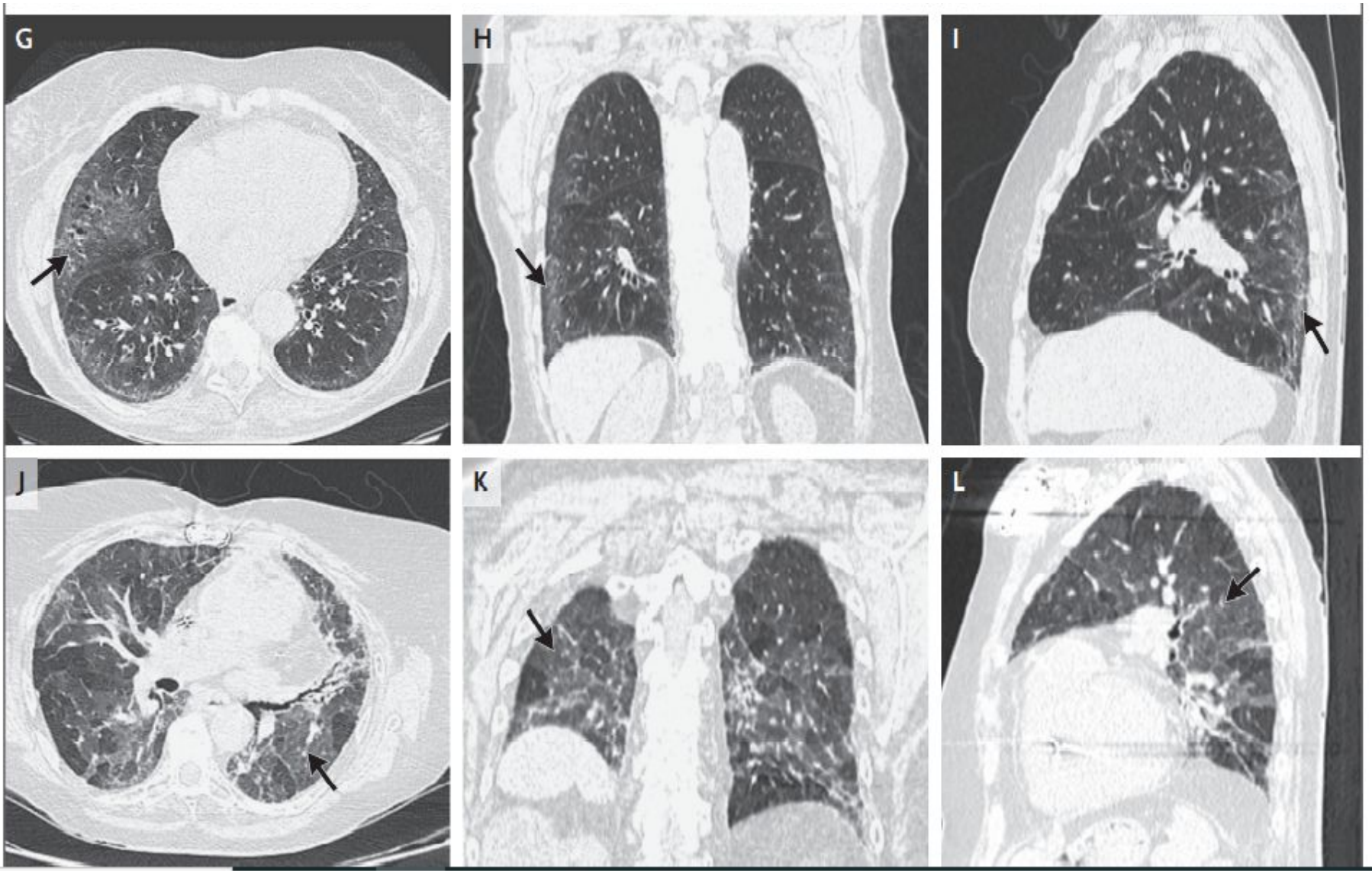
G
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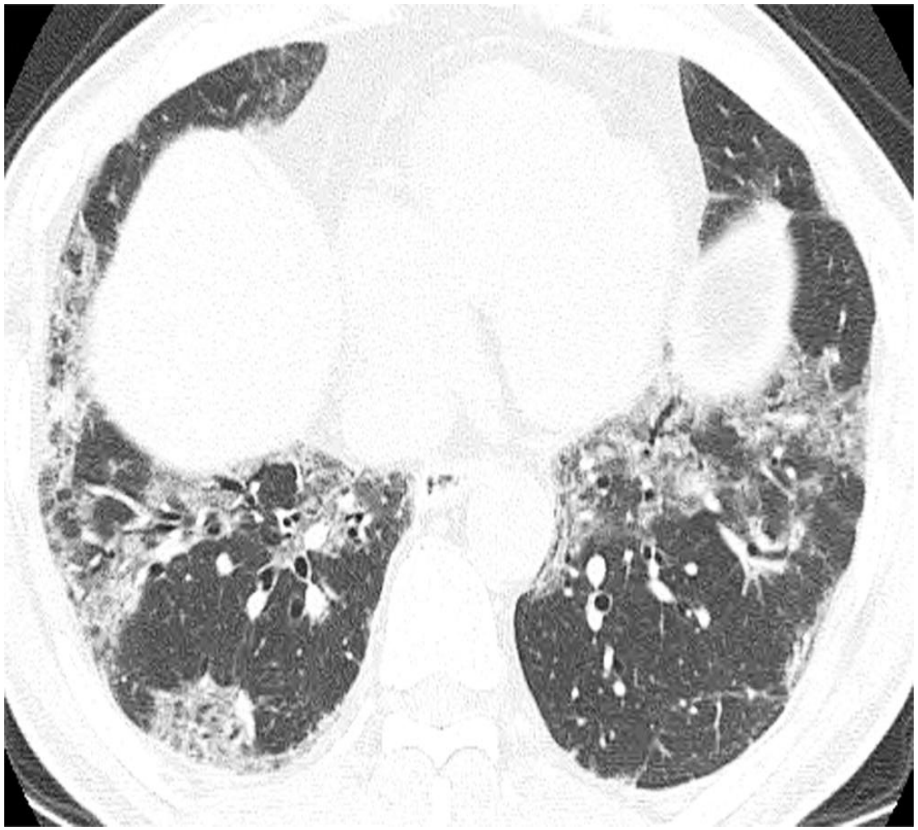

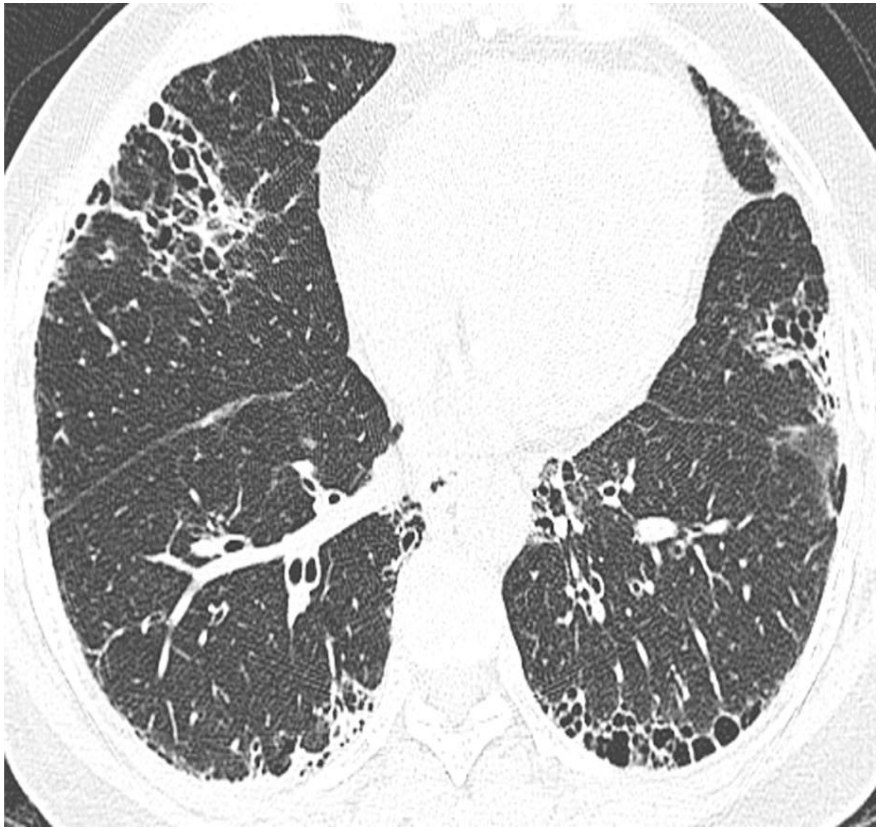

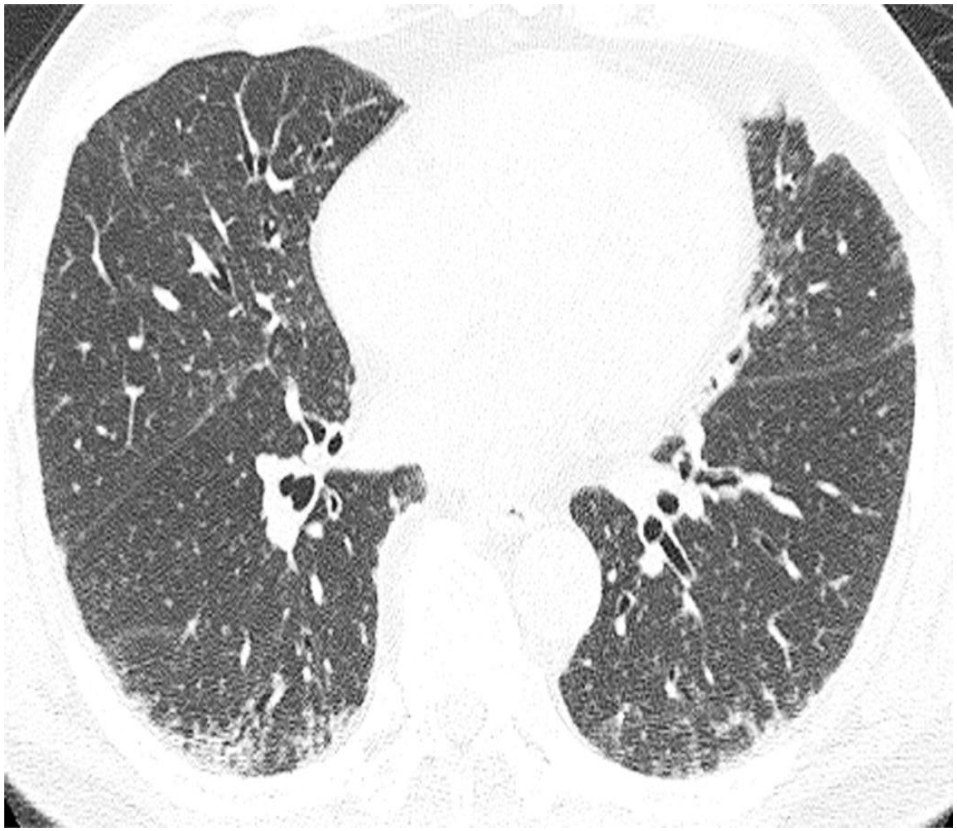

High resolution computed tomography patterns and UIP diagnosis

UIP	Probable UIP	Indeterminate for UIP	Alternative diagnosis
▪ Subpleural and basal predominant; distribution is often heterogeneous* ▪ Honeycombing with or without peripheral traction bronchiectasis or bronchiolectasis¶	▪ Subpleural and basal predominant; distribution is often heterogeneous ▪ Reticular pattern with peripheral traction bronchiectasis or bronchiolectasis ▪ May have mild GGO	▪ Subpleural and basal predominant ▪ Subtle reticulation; may have mild GGO or distortion ("early UIP pattern") ▪ CT features and/or distribution of lung fibrosis that do not suggest any specific etiology ("truly indeterminate for UIP")	▪ Findings suggestive of another diagnosis, including: • CT features: ○ Cysts ○ Marked mosaic attenuation ○ Predominant GGO ○ Profuse micronodules ○ Centrilobular nodules ○ Nodules ○ Consolidation • Predominant distribution: ○ Peribronchovascular ○ Perilymphatic ○ Upper or mid-lung • Other: ○ Pleural plaques (consider asbestosis) ○ Dilated esophagus (consider CTD) ○ Distal clavicular erosions (consider RA) ○ Extensive lymph node enlargement (consider other etiologies) ○ Pleural effusions, pleural thickening (consider CTD/drugs)

UIP: usual interstitial pneumonia; GGO: ground-glass opacities; CT: computed tomography; CTD: connective tissue disease; RA: rheumatoid arthritis.
* Variants of distribution: occasionally diffuse, may be asymmetrical.
¶ Superimposed CT features: mild GGO, reticular pattern, pulmonary ossification.

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