



Interactive Lecture

Radiology of cardiorespiratory disease

Done By

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Color Coding

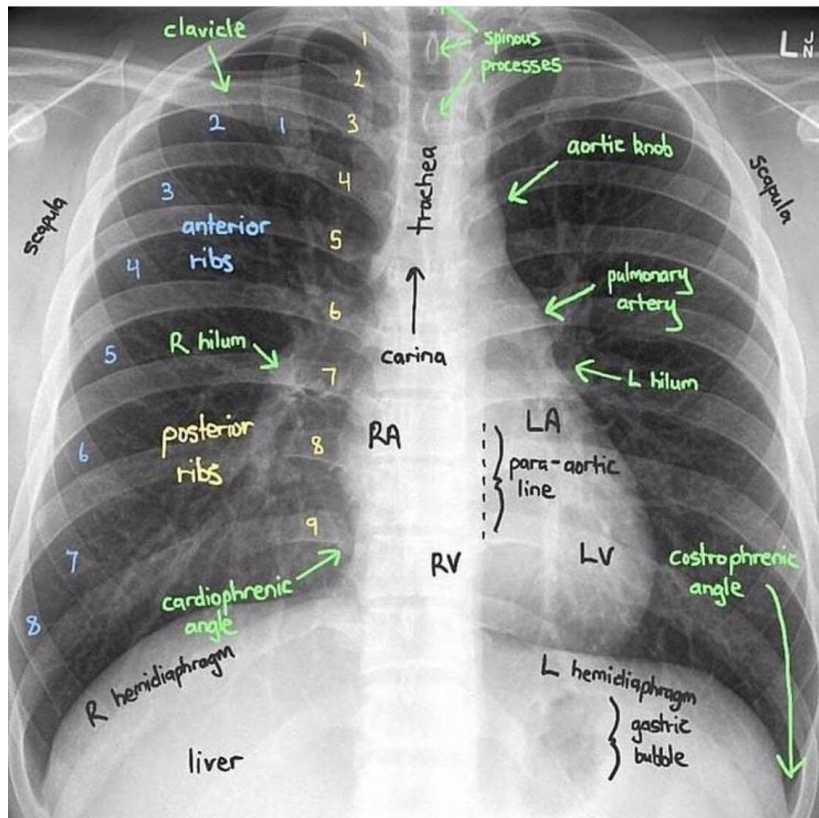
Important | Notes | Extra

[Editing](#)

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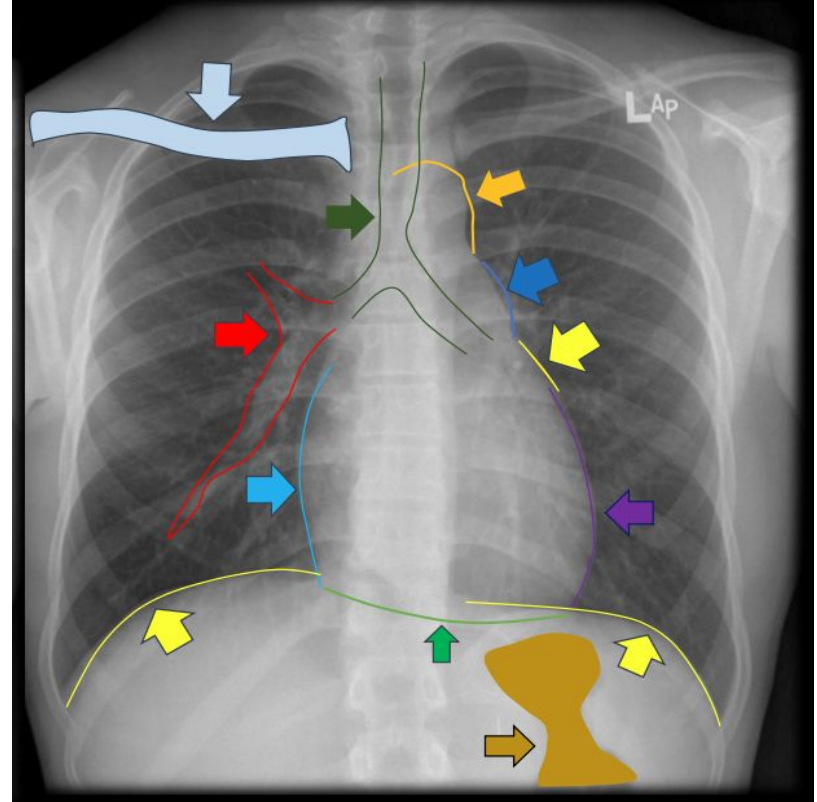
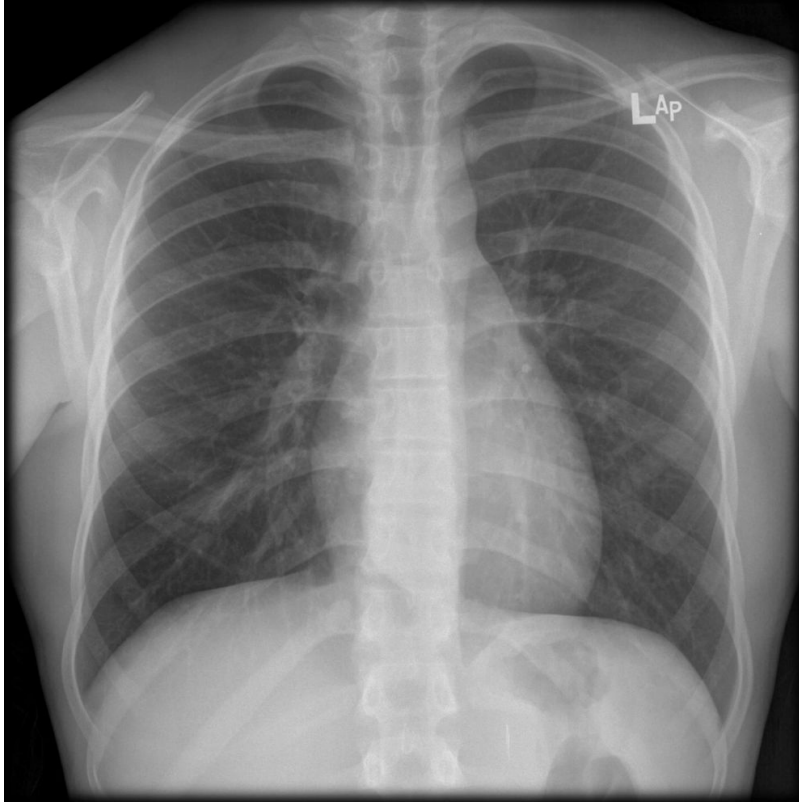
💡 Have a quick revision!



Extra image

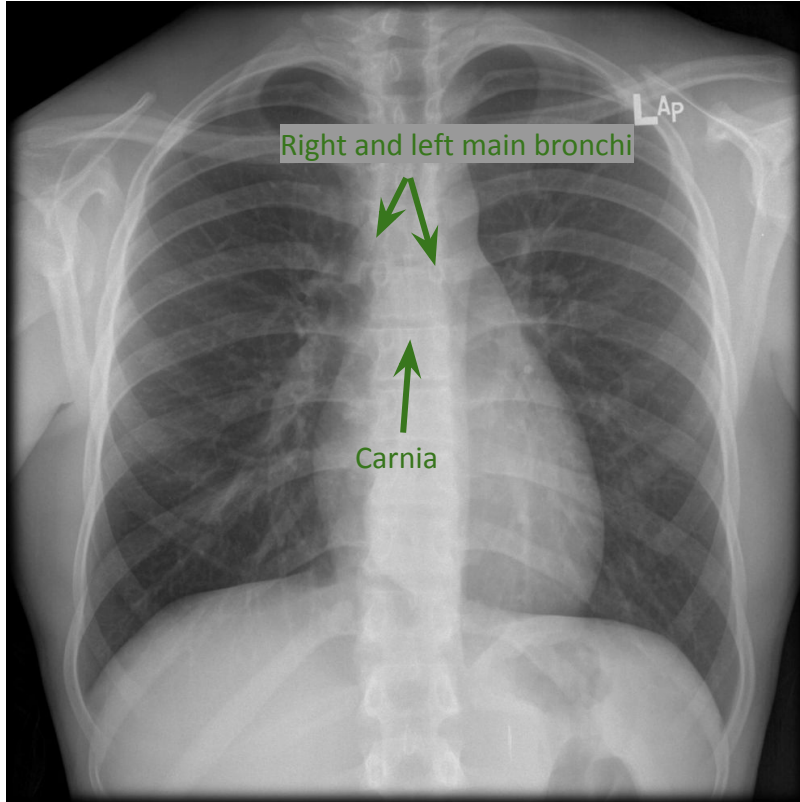


Name the labels

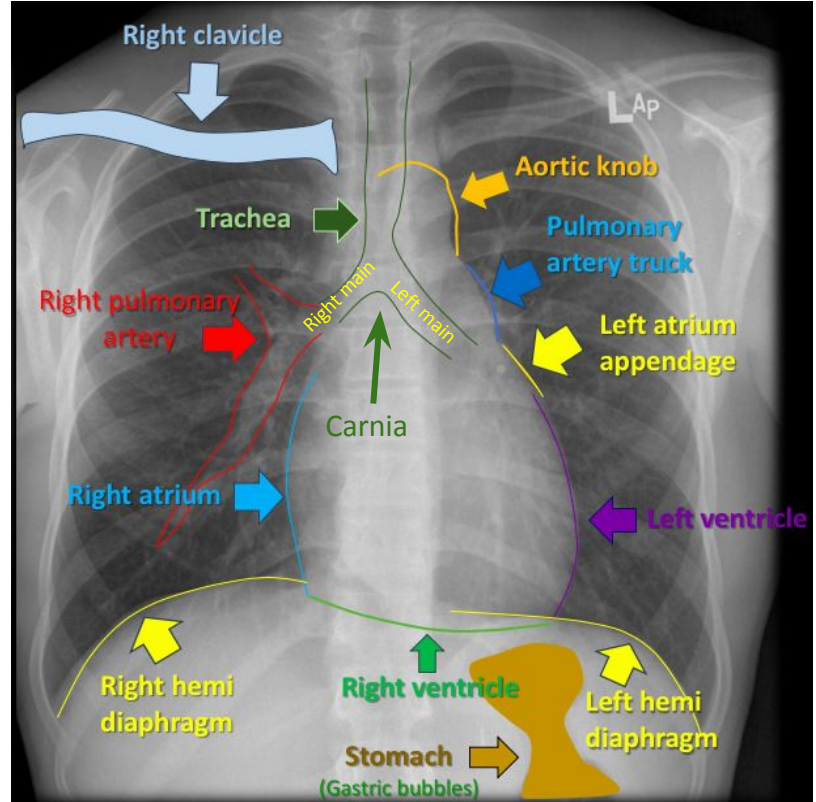




Name the labels



Anterior-posterior & PA are called frontal view



(We are not sure if it is AP or PA view)



For better understanding

All the explanation by
dr. Aljurayyan in one place

Differential diagnosis for the abnormal white
(**Hyperdense**) abnormalities on the radiograph:

1- Pleural effusion.

Check the **costophrenic angle**, is it sharp or blunted?
Look for **meniscus sign**. (Crescent).

2- Lung collapse (Atelectasis).

Is there a **wedge sign** on the lateral view X-ray?
tracheal deviation + **reduced lung volume**

3- Mass.

Does the opacity have **well demarcated margins**?

4- Infiltration/consolidation

Rare. **ill-defined border**

Remember: The history helps a lot, so a history with smoking make us think of a tumor, and history of DVT make us think of PE, and malignancies usually does not present with fever.

Differential diagnosis for the abnormal black
(**Hypodense**) abnormalities on the radiograph:

1- Emphysema.

Barrel chest (No change in width between the apex and base of the lung).
You can still see some soft tissue (Bronchioles).

2- Pneumothorax.

Super black tissues, no soft tissues at all.



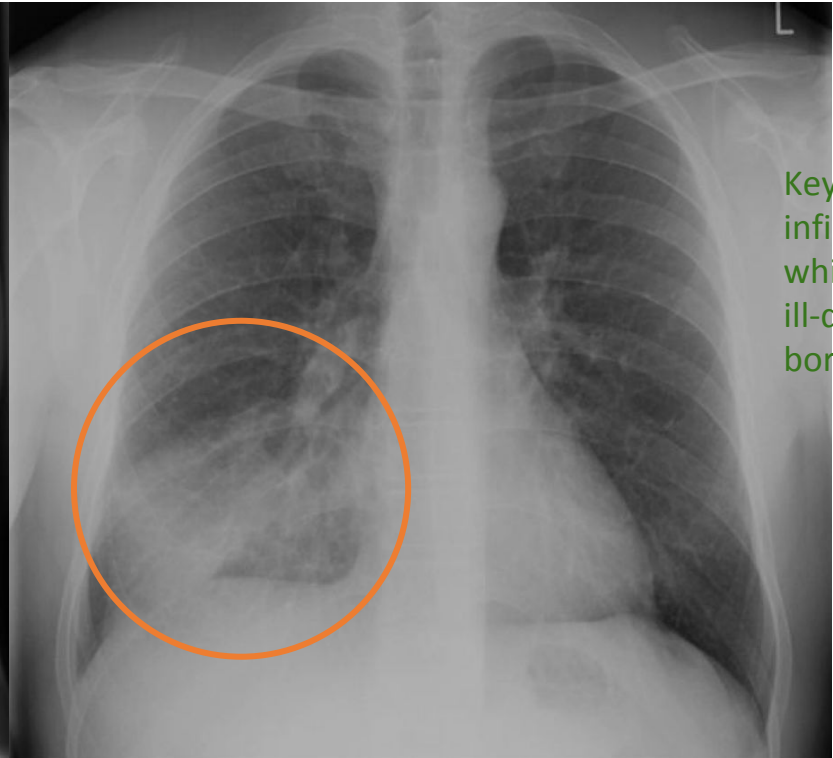
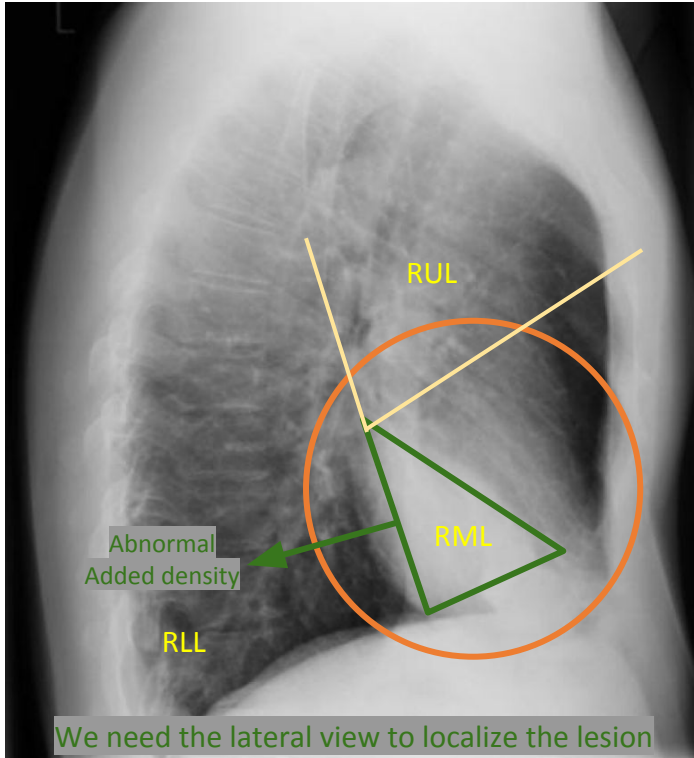
30 year-old with fever



- Is it a mass or infiltration?
- Which lung lobe is affected?



30 year-old with fever



Key feature of infiltration = white area with ill-defined borders

- Is it a mass or infiltration? Infiltration/pneumonia. (Air space density) (consolidation)
- Which lung lobe is affected? Right middle lobe.

- White abnormality.
- Think about the DDx.



50 year-old smoker



What is the most likely diagnosis?



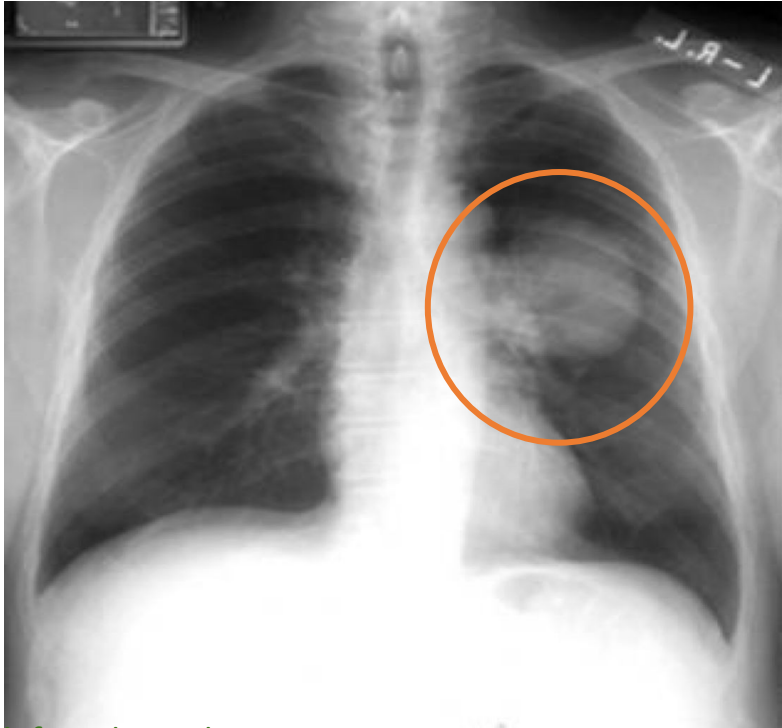
50 year-old smoker



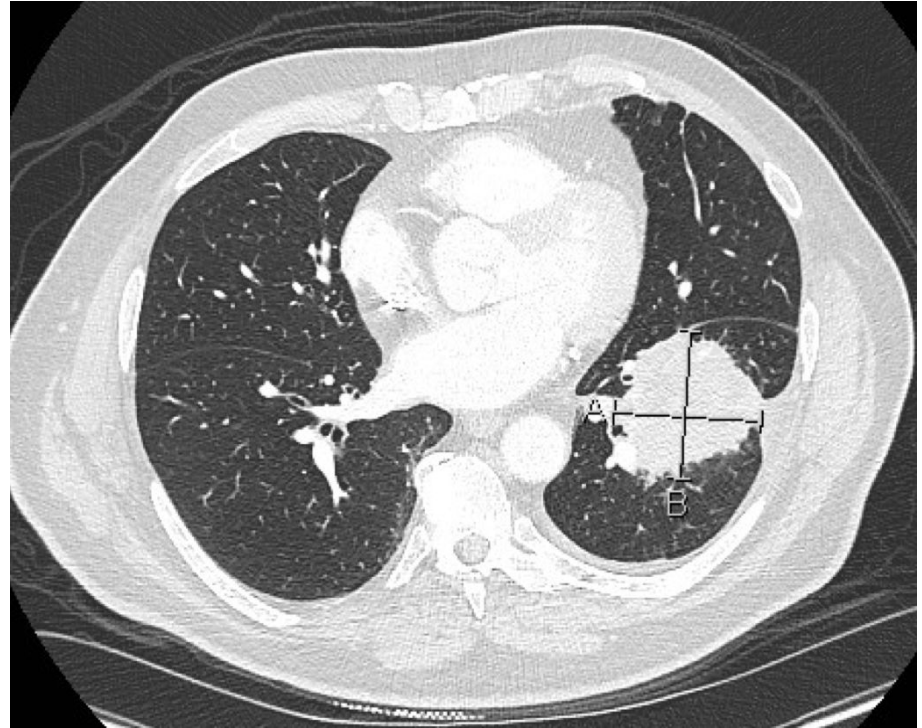
What is the most likely diagnosis?



50 year-old smoker



X-Ray



CT scan

Side: left, Color: White
Margins are well seen.
Costophrenic angle is seen.
No tracheal deviation.

- What is the most likely diagnosis?
- Left lung mass. Read the history, smoking is a risk factor To confirm lung mass do CT



Remember!

Always look for the borders if clear or not ,CP angle (effusion) and, lung volume (atelectasis), Deviation.



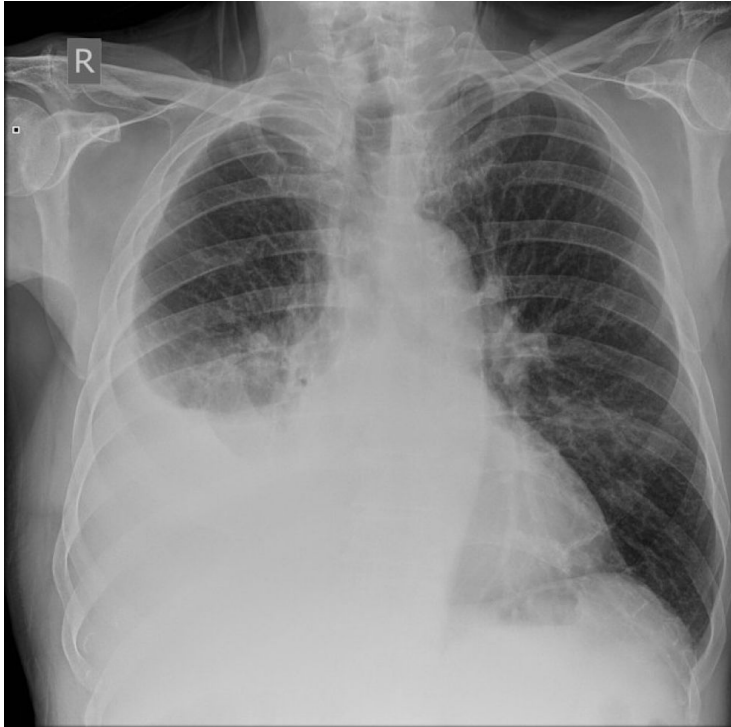
Mass



Pneumonia
infiltration



40 year-old female complaining of dyspnea



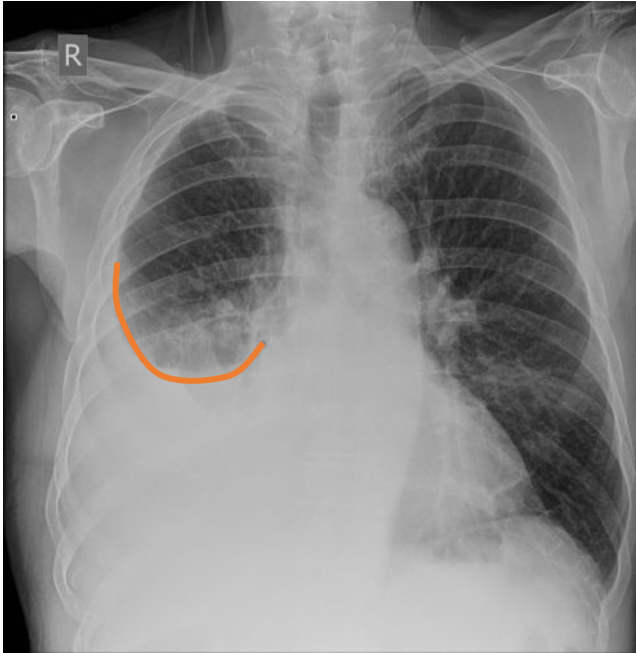
What is the most likely diagnosis?



40 year-old female complaining of dyspnea

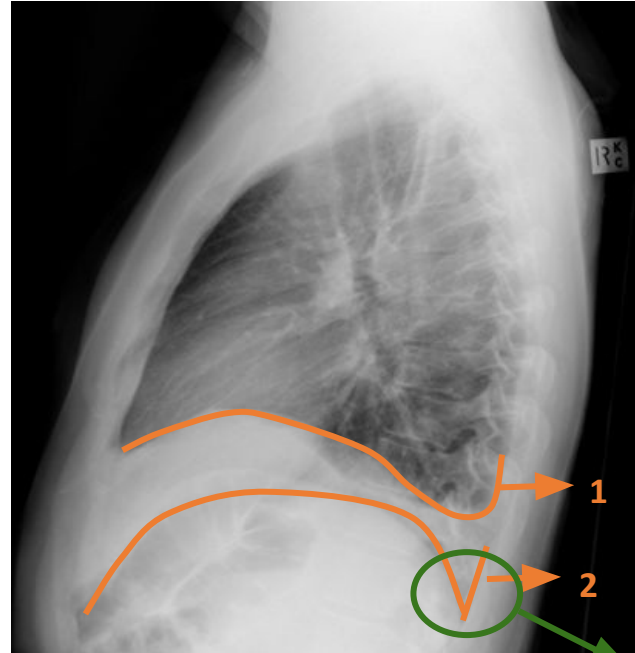
Sometimes the effusion compress the lungs & lead to its collapse which causes tracheal deviation.

Pleural eff can give (1) Air fluid (2) Collapsed part of the lung with mild shift of trachea



Look for meniscus sign

- What is the most likely diagnosis?
- Right pleural effusion.



Pleural effusion on lateral view

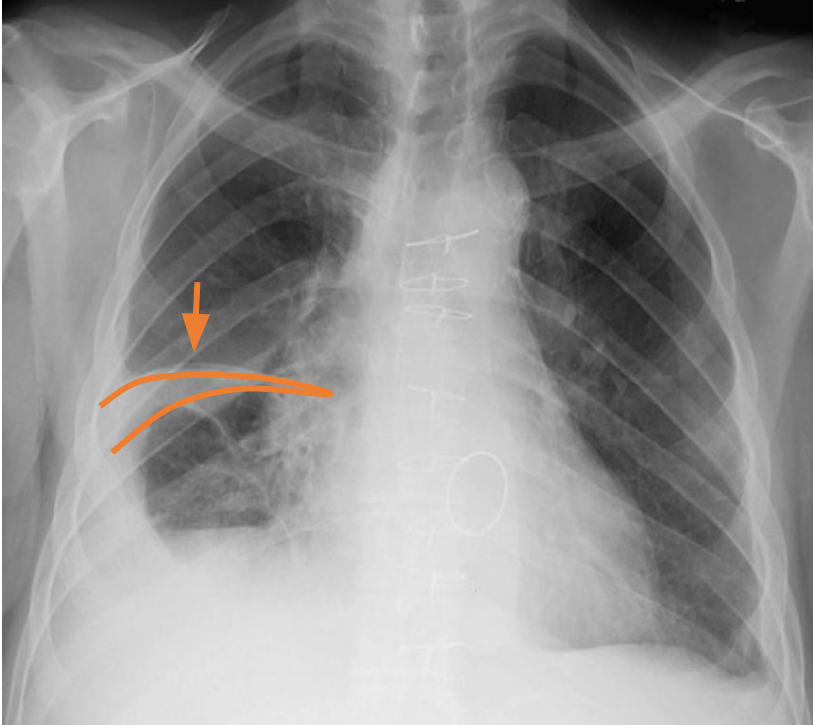
- 1- The pleural effusion.
- 2- Normal side.

Pleural effusion key feature = meniscus sign

Effusion appears in lateral view before frontal even little amounts (70-80 ml) while in frontal (200-600 ml)

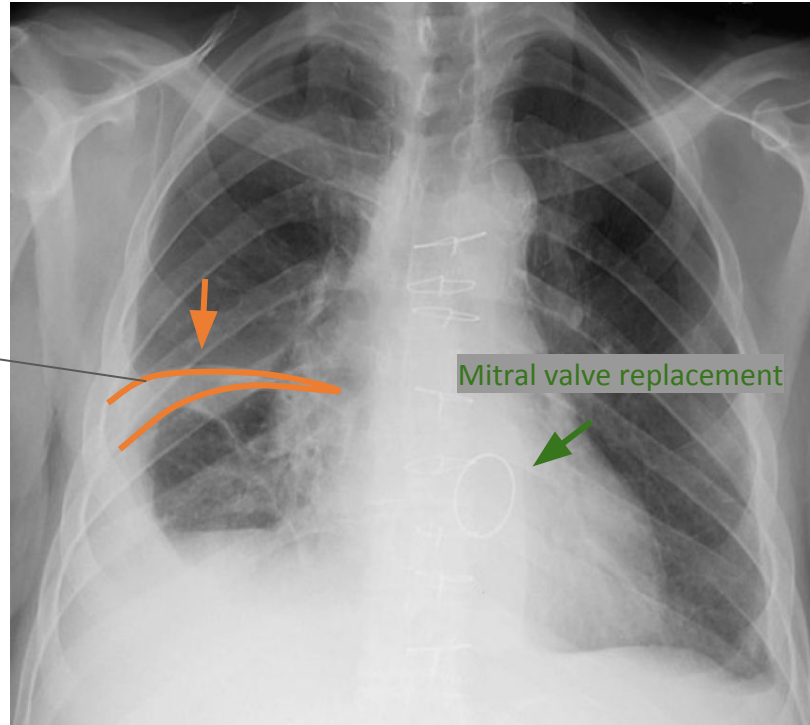
Always look here. Blunted costophrenic angle.

What is this?



What is this?

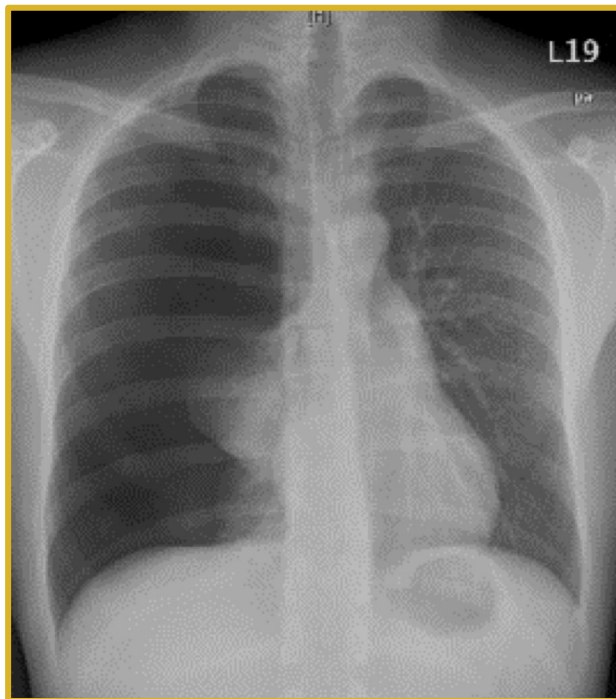
Fluid filling the
fissure + effusion
(meniscus sign)
Can be exudate
because it's thick fill
in one space.



Pleural effusion (fluid tracking right horizontal fissure)
(fluid found its way into the fissure)



25 year-old male with chest pain



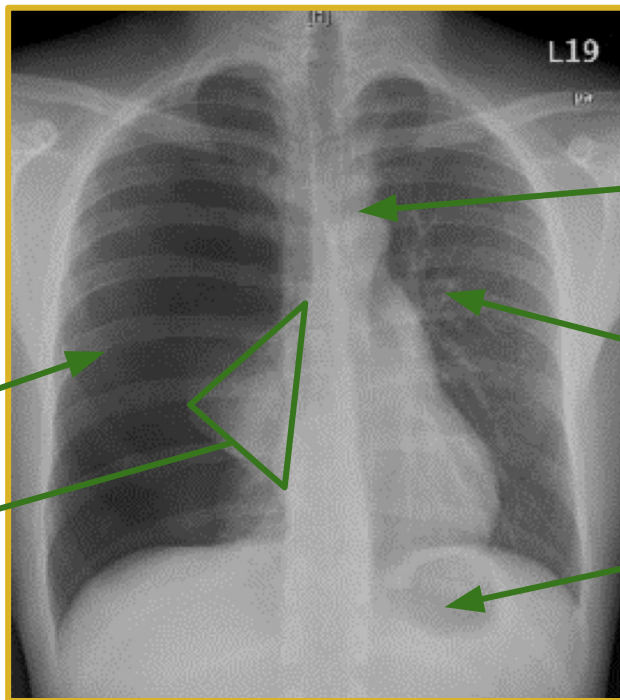
- Which side of the chest is abnormal?
- What is the diagnosis?



25 year-old male with chest pain

Pleural space is normally a closed space and have a negative pressure, this pressure prevents it from collapsing. So, whenever you try to expire all the air you can't, unless there is pleural defect causes loss of lung maintenance.

More black (more air) either:
1- pneumothorax > air around the lung
2- emphysema (COPD) > air inside the lung + more ribs + barrel chest appearance + affects both lungs



Mild displacement of the trachea (pushed to the opposite side).

Normally, Lung is mix of air and soft tissue.

Gastric bubble (Normal).

Abnormal

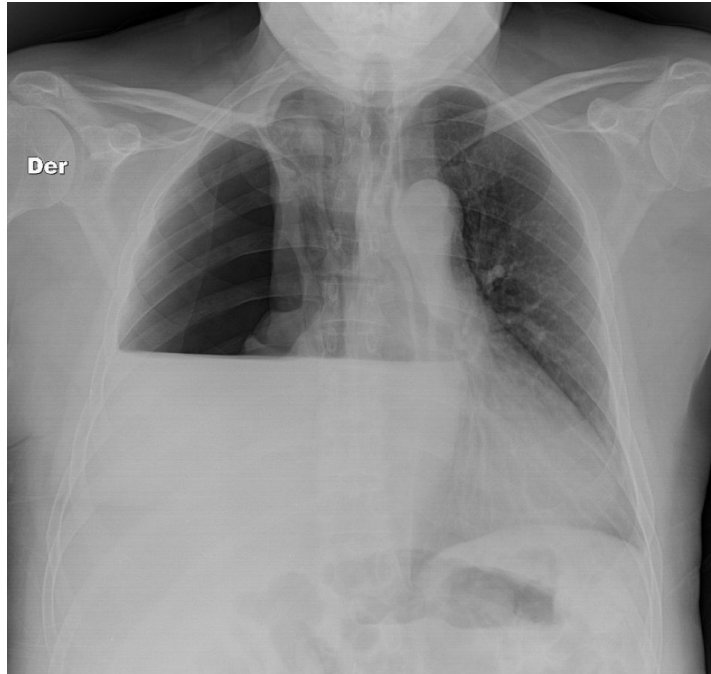
Black: air is either inside/outside the lung

The collapsed lung
Air escape from the lung and compressing it.

- Which side of the chest is abnormal? Right side.

- What is the diagnosis? Pneumothorax. Emphysema usually affects both sides, but pneumothorax commonly affects only one.

What is the diagnosis?

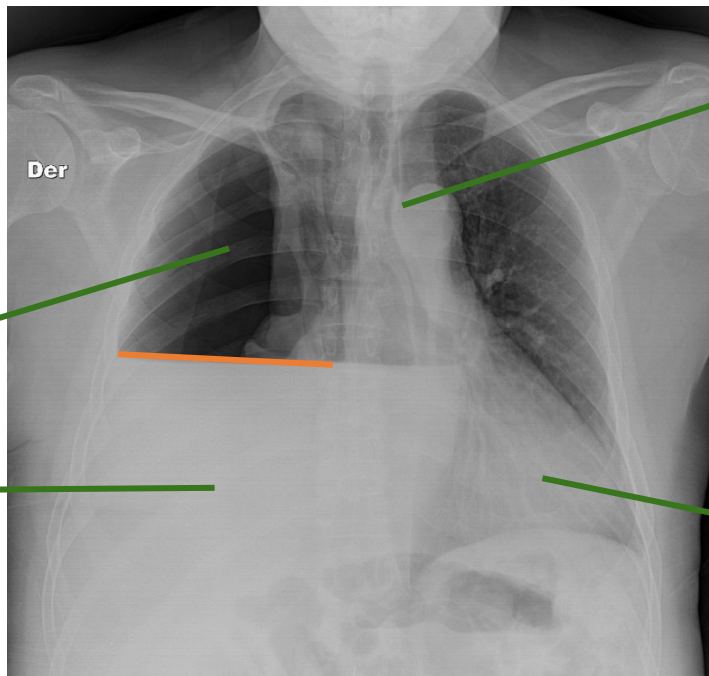


Notes on the image:

More Black more white, air fluids in the same area, the line won't be crescent or irregular but will be very regular.

Patient is sitting up so the fluids will be down (gravity).

What is the diagnosis?



The trachea is pushed

Why is it a straight line?

Because there is air (like a bottle of water which contains both air and fluid).

More black (air)

More white (fluid)

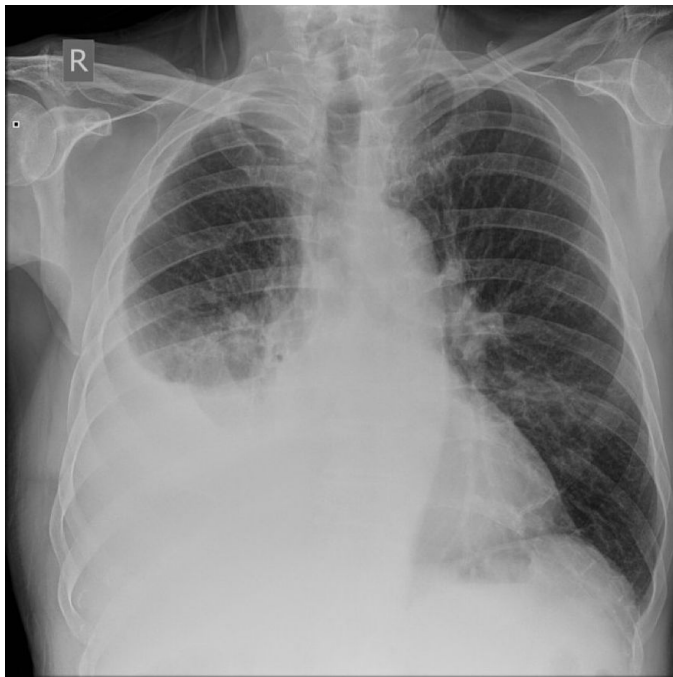
The heart is normal in size but pushed

Hydro-pneumothorax

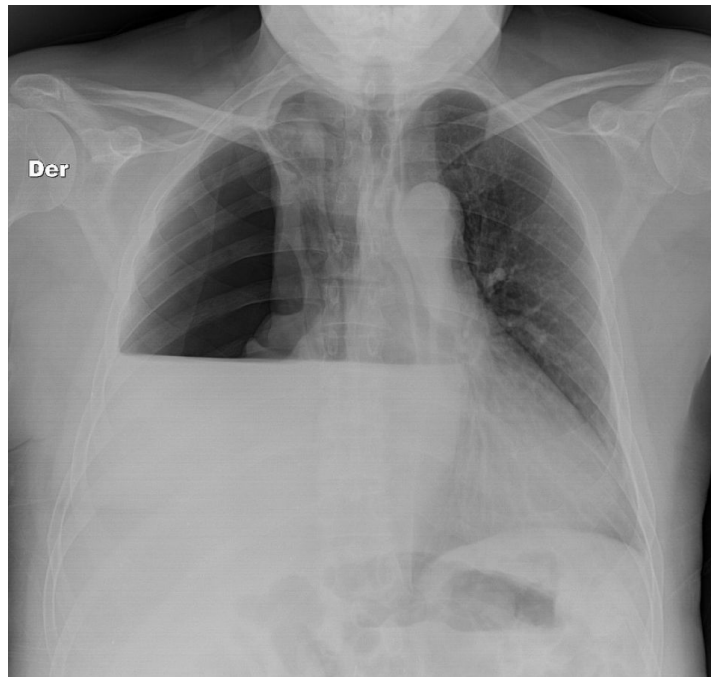
(Look for air/fluid level)



Remember!

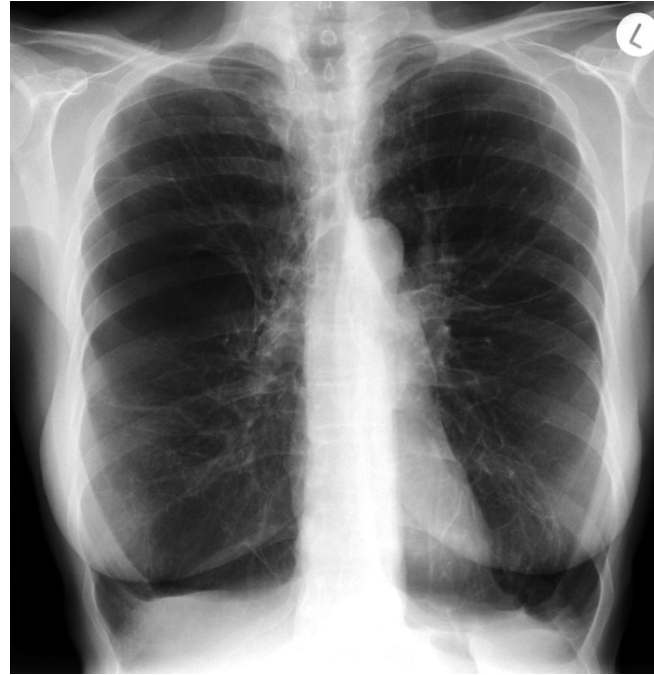
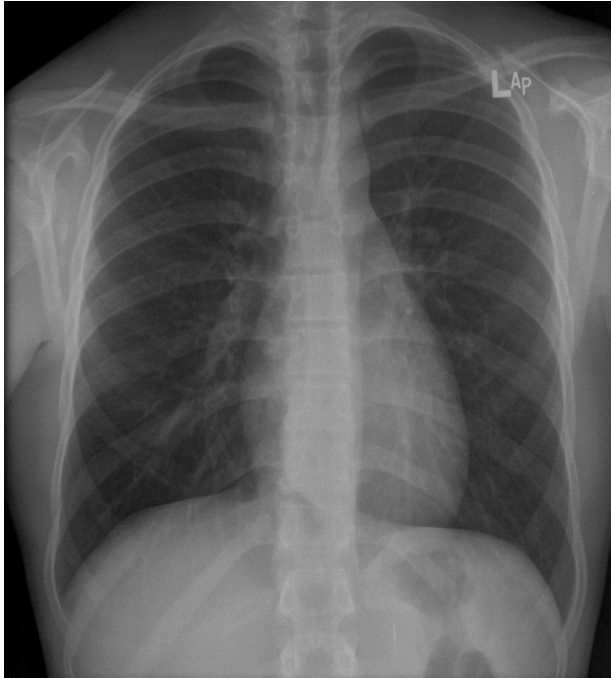


Pleural effusion
Curved line = meniscus sign
Irregular (not straight line)



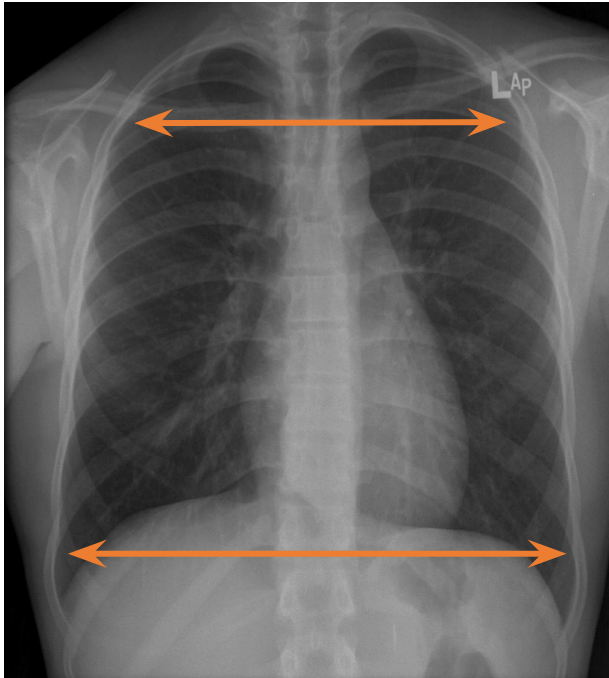
Hydro-pneumothorax
straight line = air fluid level

Which film is abnormal? What is the abnormality?



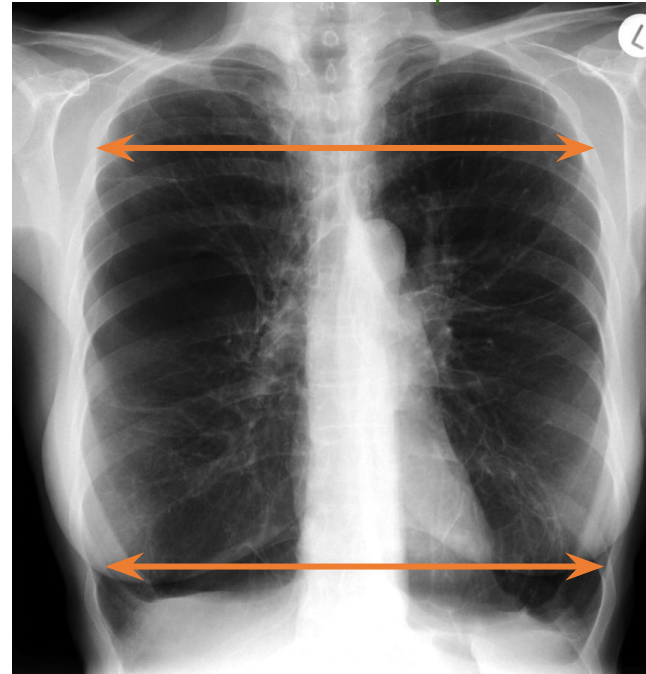
Which film is abnormal? What is the abnormality?

- (1) Black
- (2) bilateral
- (3) we can still see lung tissue
- (4) Chronic process and shape changes.



Normal

The base is wider than the apex



Abnormal emphysema

Both base and apex have the same width > indicates chronicity
Lung tissue Still seen > emphysema

شكل الرئة الطبيعي
يكون مشابه للجرس
واسع من تحت
وصغير من فوق ، لكن
هنا في الأبنورمال
شكلها بنفس العرض
فوق وتحت

Which film is abnormal? What is the abnormality?



Which film is abnormal? What is the abnormality?



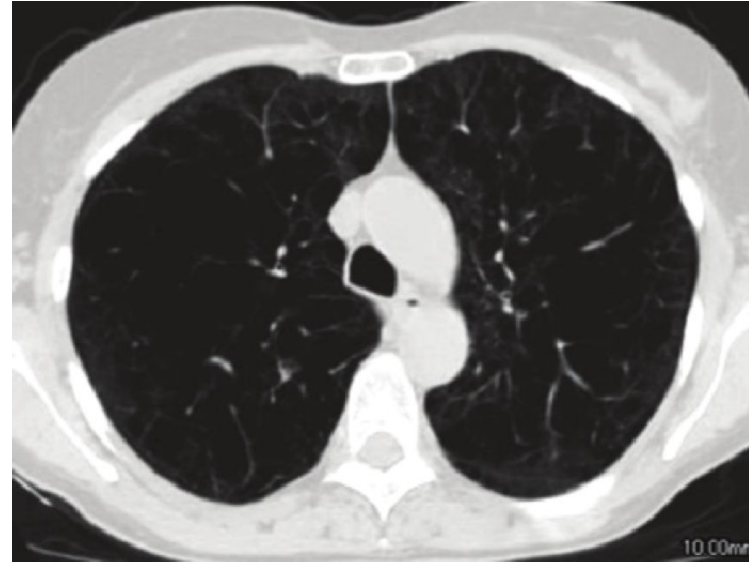
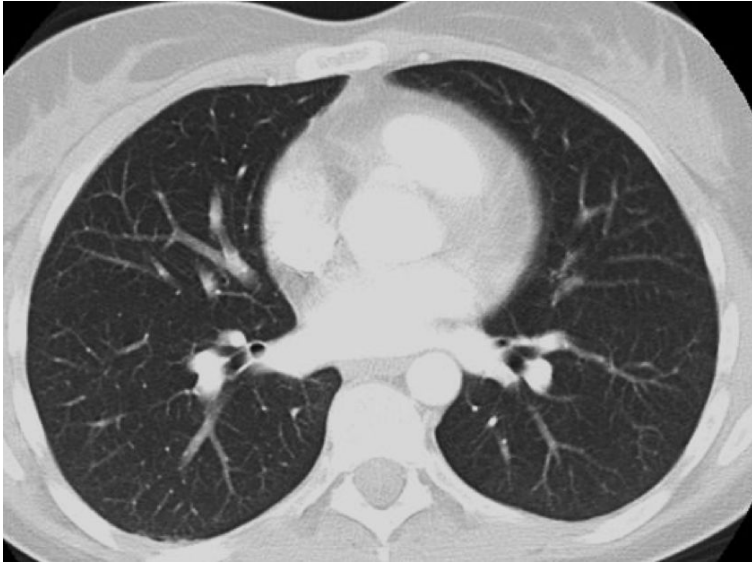
Normal



Abnormal emphysema

More black and the top almost same to the bottom in width

Which CT-scan film is abnormal? What is the abnormality?



Which CT-scan film is abnormal? What is the abnormality?



Normal

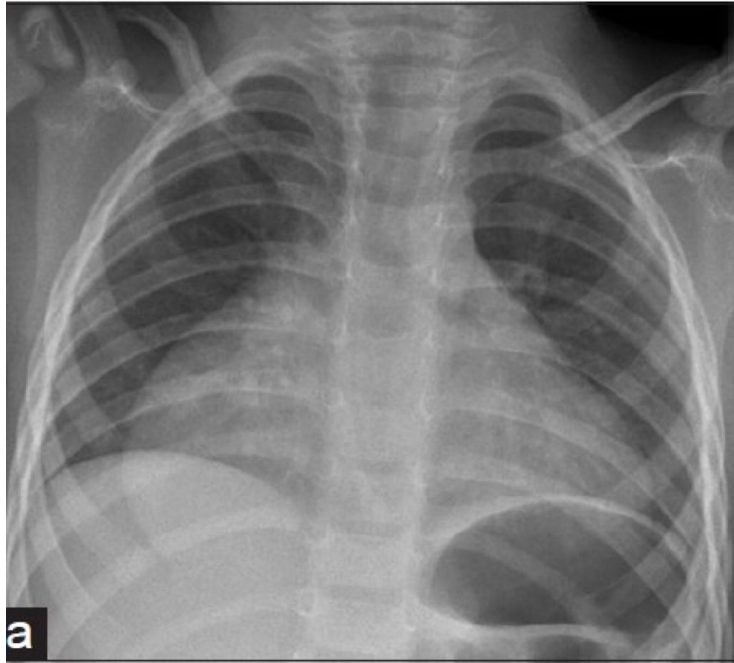
In normal you still see fine grey lines and vessels



Abnormal emphysema

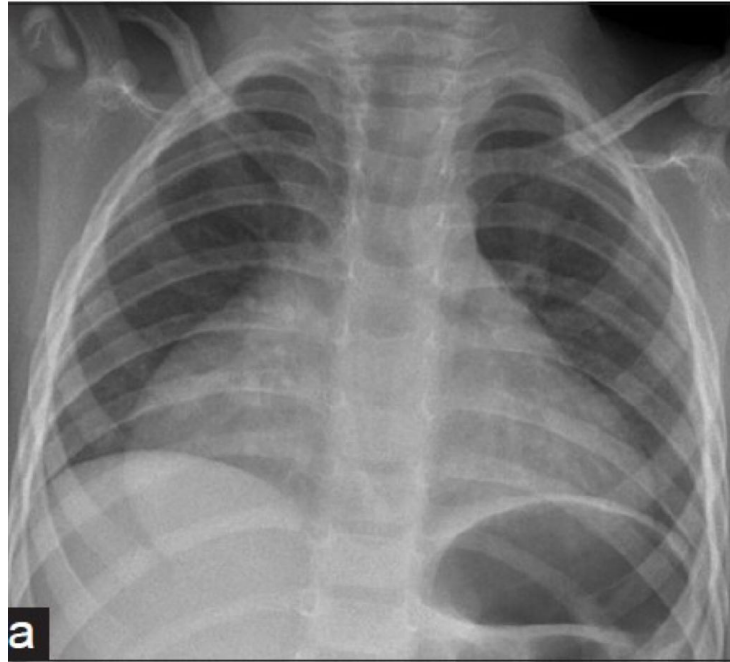
Most of the lung is distorted and replaced by air
Only vessels and air are seen and small amount of tissues

1- What is Abnormal?



2- Can you figure out which heart chamber is enlarged?

1- What is Abnormal?



In order to diagnose Left atrium enlargement we need to see right double border sign

1- Heart shadow is enlarged.

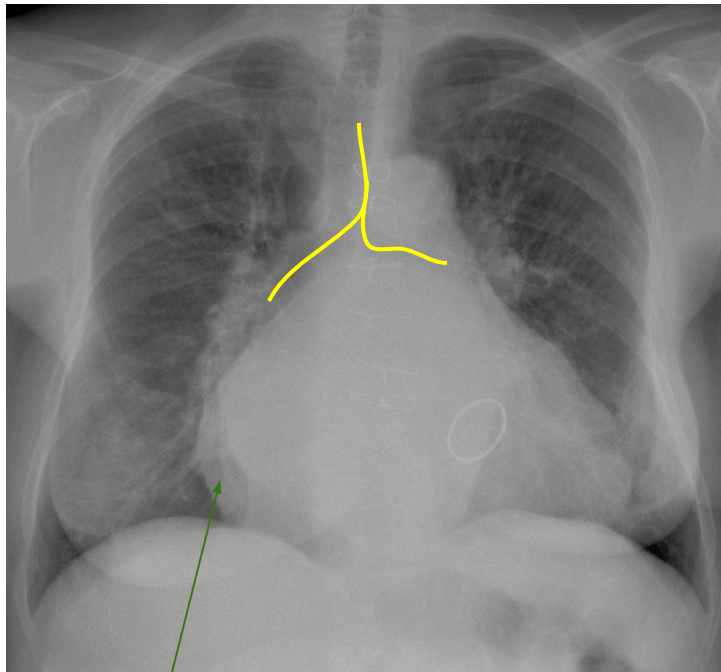
2- Can you figure out which heart chamber is enlarged?

2- Right atrium.



Remember!

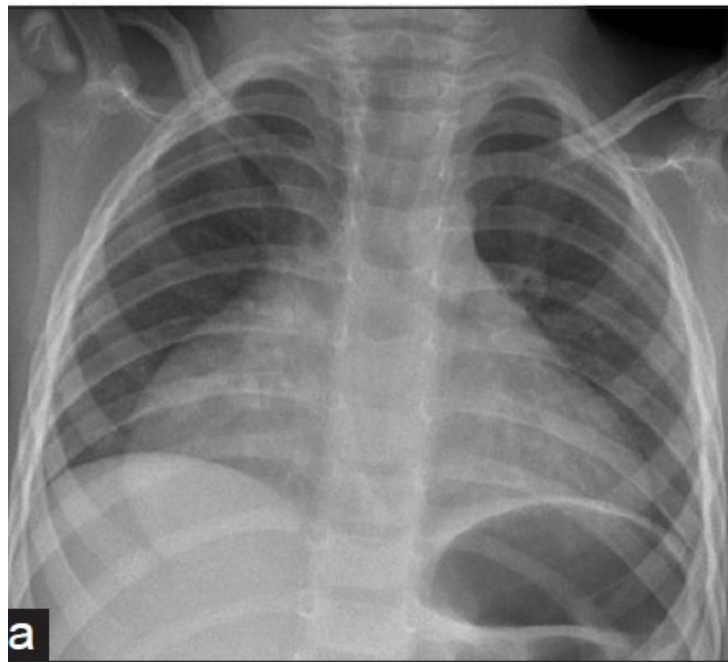
Both show enlarged heart size



Left atrium enlargement

Double border sign

Widening of the aorta + Pushed airways + carina wide

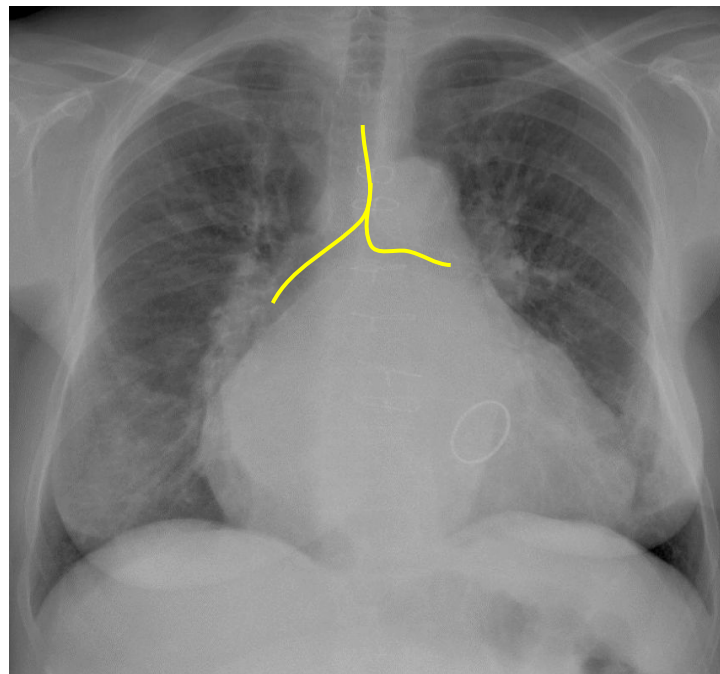
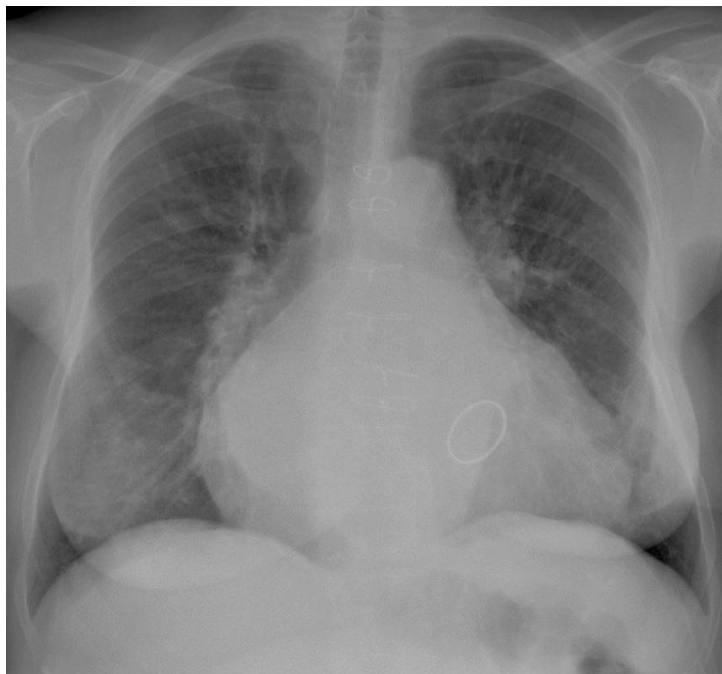


Right atrium enlargement

Carina + Airways are normal

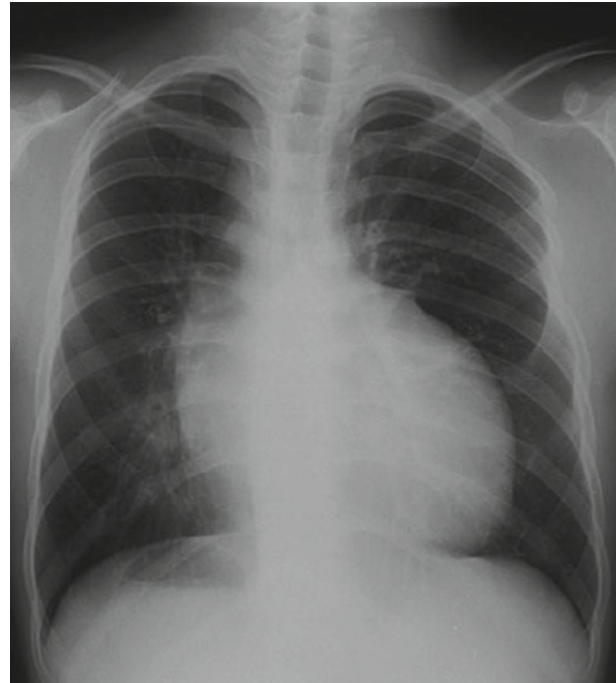
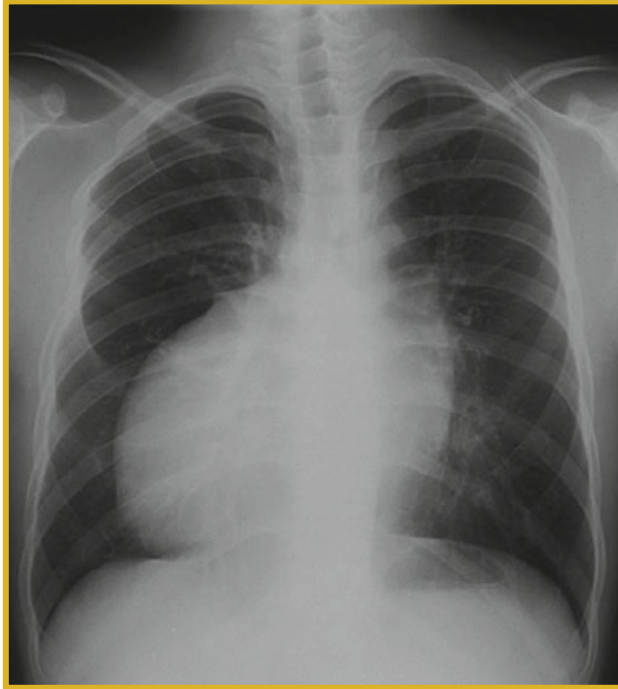


For better understanding



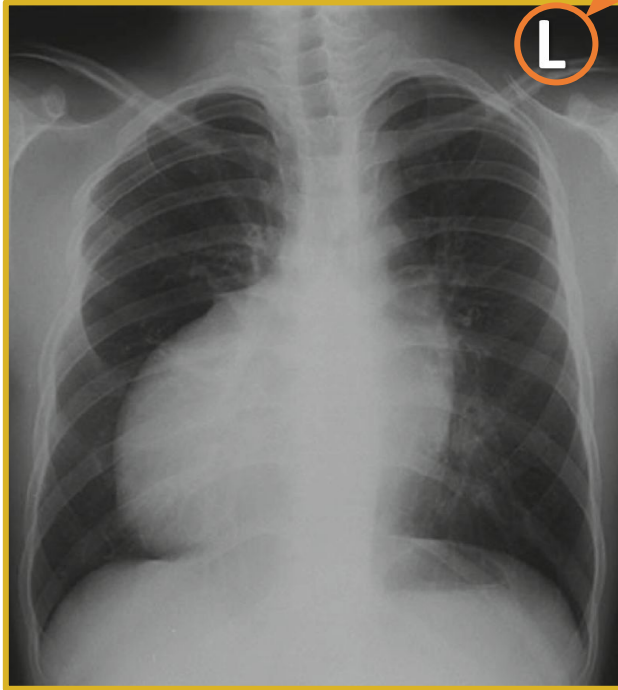
Notice the carina

What is the diagnosis?



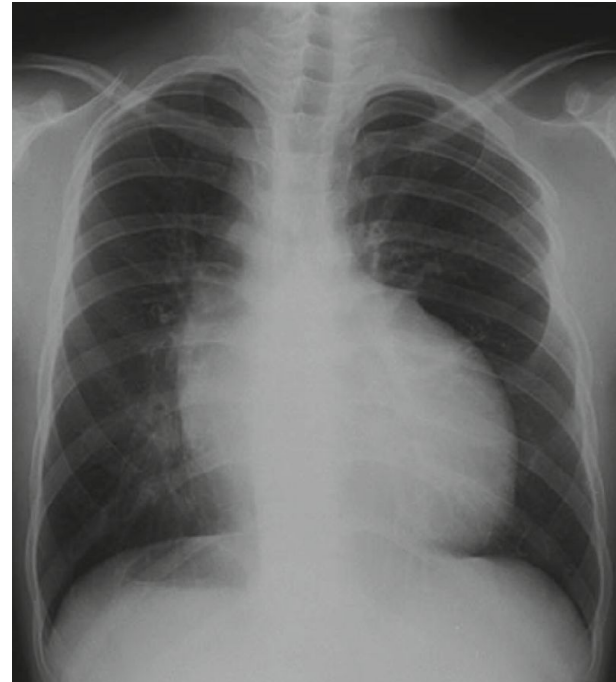
What is the diagnosis?

Always check for the side label (L or R)



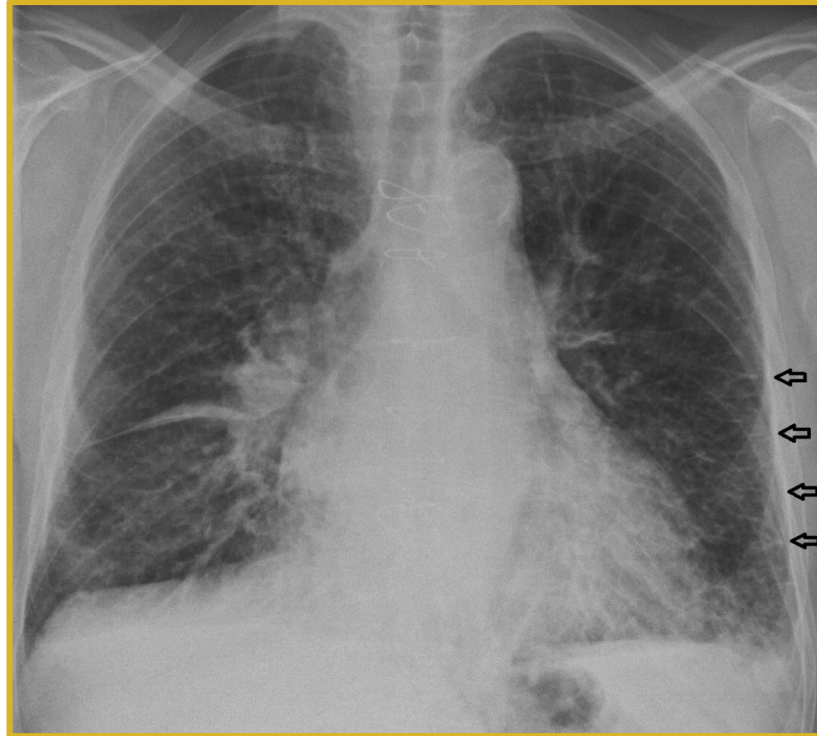
Dextrocardia

The apex is pointing to the other side
& there is cardiomegaly.





60 year-old male with difficulty in breathing



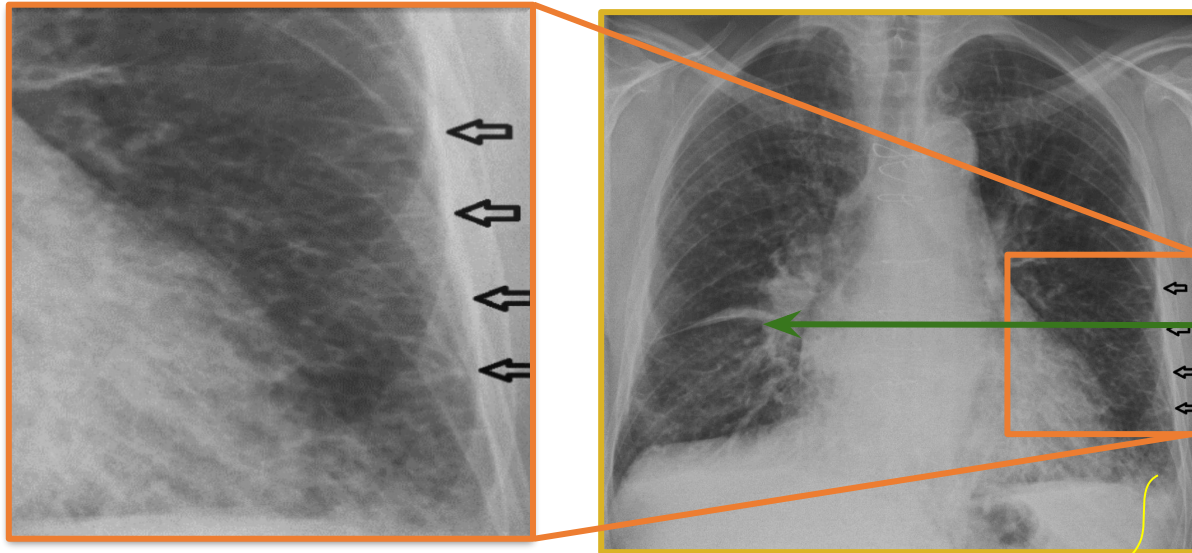
- What is the most likely diagnosis?



60 year-old male with difficulty in breathing

Notes on the image:

- (1) Lung is abnormal
- (2) white lines
- (3) cardiomegaly
- (4) cardiogenic edema

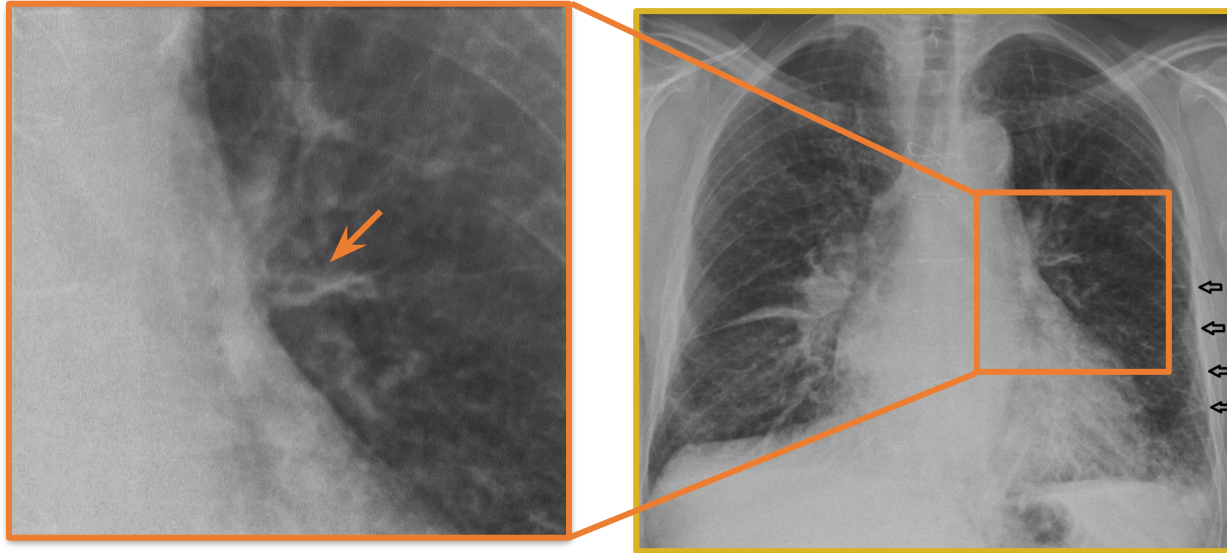


Kerley B lines

Slight pleural effusion.
Enlarged heart.

- What is the most likely diagnosis?
- Cardiogenic pulmonary edema (interstitial).key sign = kerley B lines

60 year-old male with difficulty in breathing



Peribronchovascular cuffing

Ring around the airway

- What is the most likely diagnosis?
- Cardiogenic pulmonary edema (interstitial).

What do you see in this X ray?

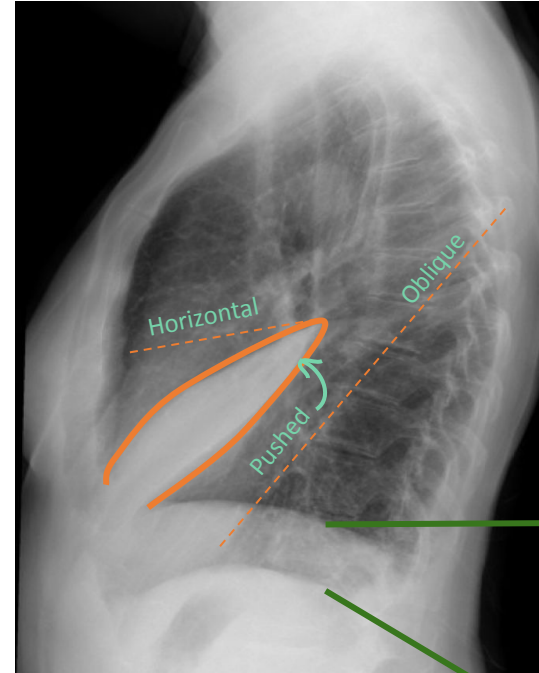


What do you see in this X ray?

Right lung abnormal
= more white

When lung collapsed its volume decreased and the space between the ribs will also decreased compared to the other side.

(Normally left lung is smaller than the right lung because of the heart. Here both lungs have the same size meaning the right lung is collapsed)



Displacement
of the fissures
with collapsed
RML of the lung

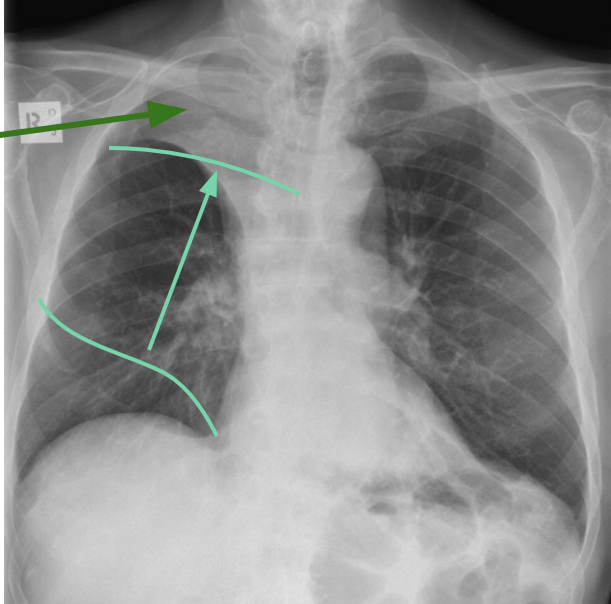
Right middle lobe collapse

Right
hemidiaphragm

Left hemidiaphragm



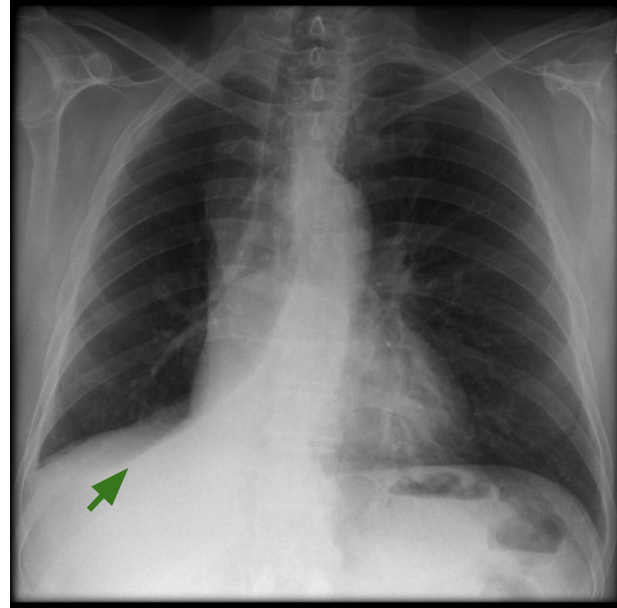
Remember!



Right upper lobe collapse

Upper lobe is big, so when it collapses the other lobes try to occupy the space and pulls the diaphragm up.

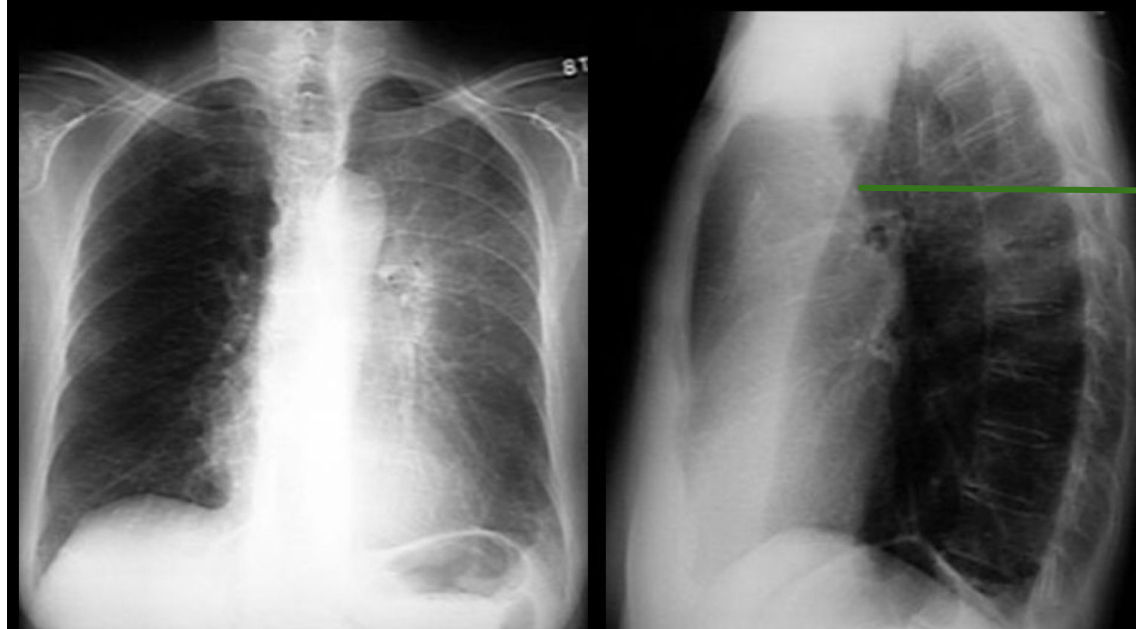
Transverse fissure pulled up



Right lower lobe collapse




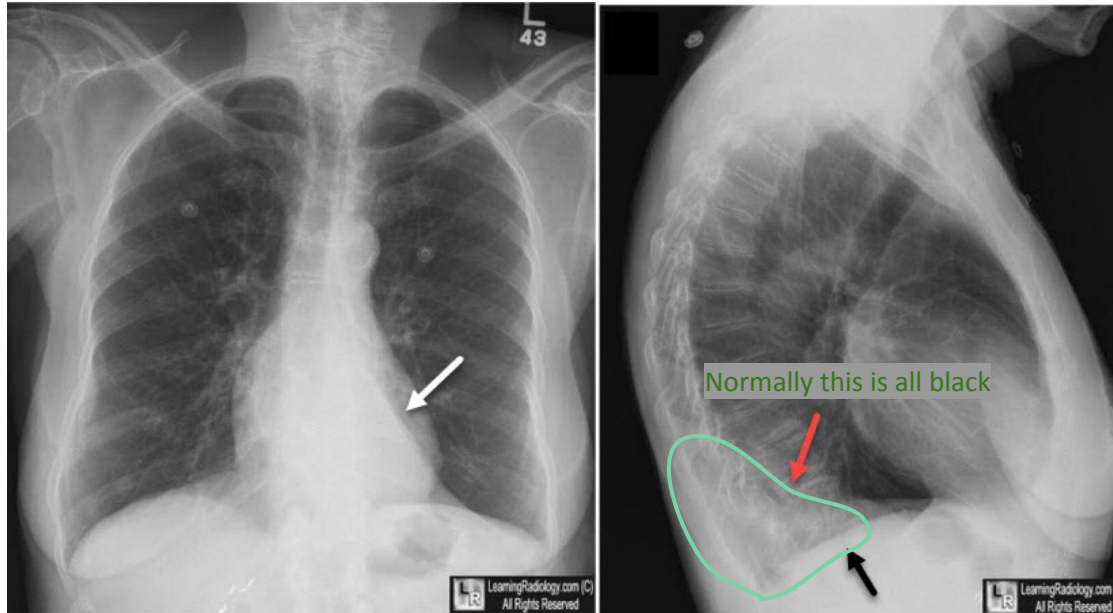
Remember!



The oblique fissure is clear due to the collapse and the white density caused by the collapsed tissue. Anything anterior to the collapsed part will be white. Anything posterior will be black.

Left upper lobe collapse

 Remember!



Left lower lobe collapse
Notice the triangular shape behind the heart

50 year-old with severe chest pain



- What is abnormal?
- What will you do next?

50 year-old with severe chest pain



(aortic knuckle abnormal)

Differential diagnosis:

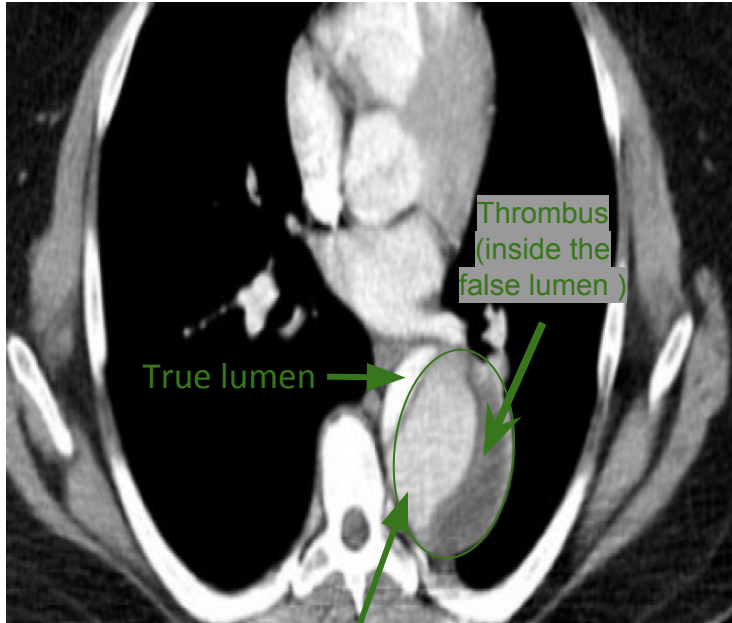
- Aneurysm.
- Aortic dissection.

- What is abnormal? The aorta is enlarged.
- What will you do next? CT scan (CT aortogram).

What is the diagnosis?



What is the diagnosis?



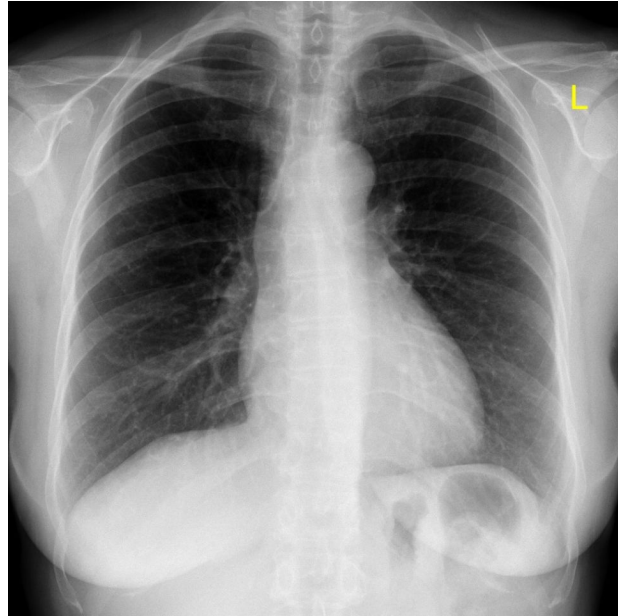
False lumen
usually appears
less dense than
the true lumen

False lumen
Caused by the blood
entering the abnormal
damaged lumen

Aortic dissection



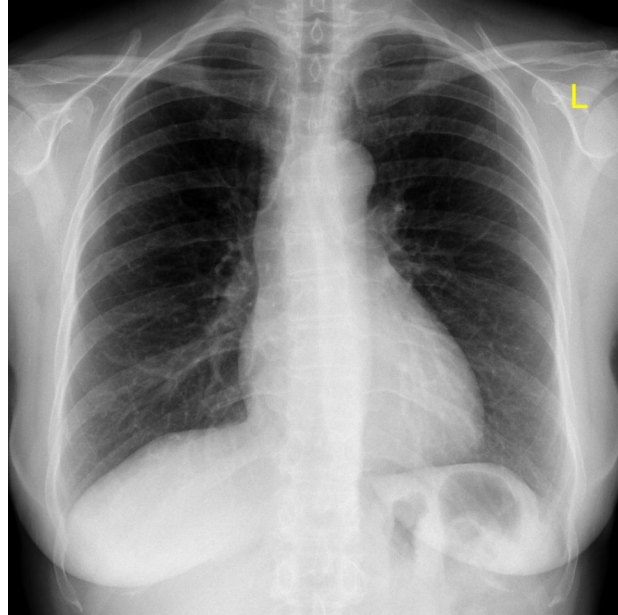
40 year-old female with chest pain after a 7 hours flight.
She had previous deep vein thrombosis in her lower limbs.



- What are you suspecting this patient has?
- Do you see any abnormality in this chest x ray?
- What to do next?



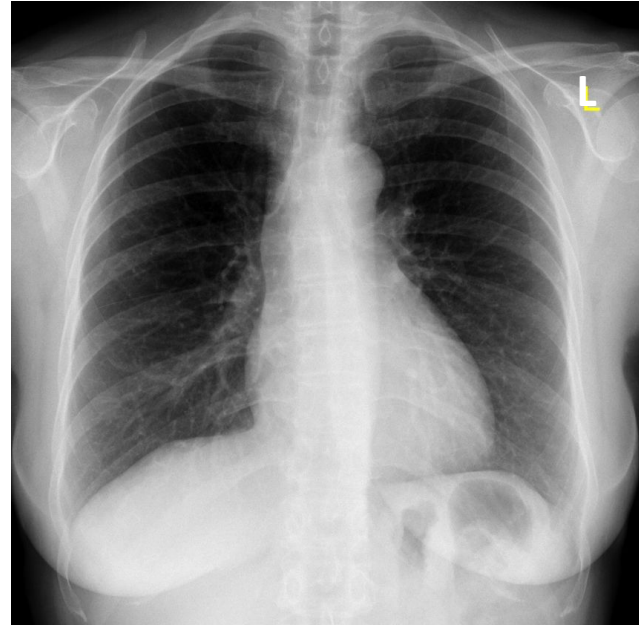
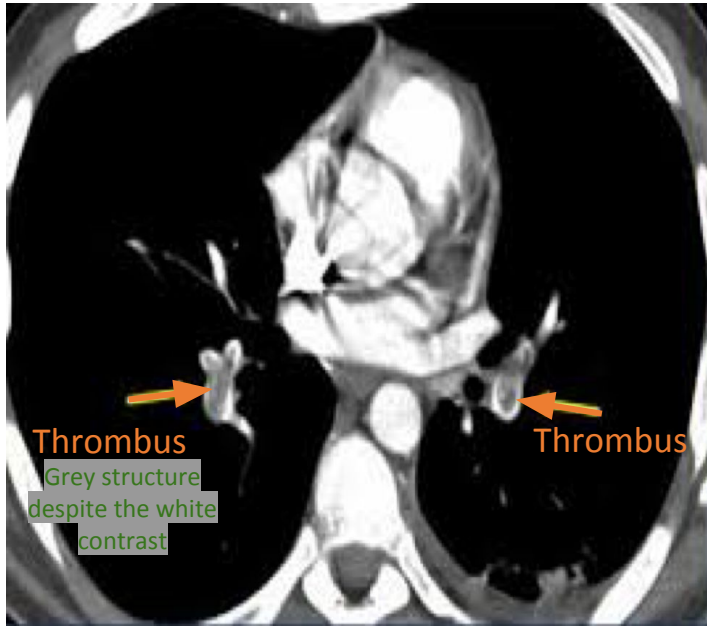
40 year-old female with chest pain after a 7 hours flight.
She had previous deep vein thrombosis in her lower limbs.



- What are you suspecting this patient has? Pulmonary embolism.
- Do you see any abnormality in this chest x ray? No.
- What to do next? CT pulmonary angiogram.

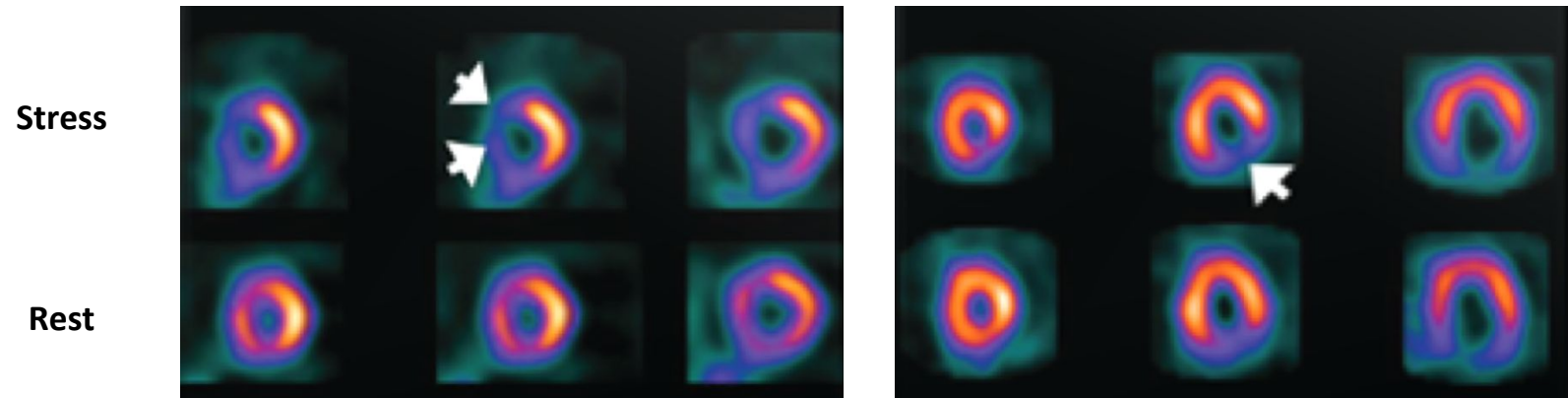
From the history

Pulmonary embolism

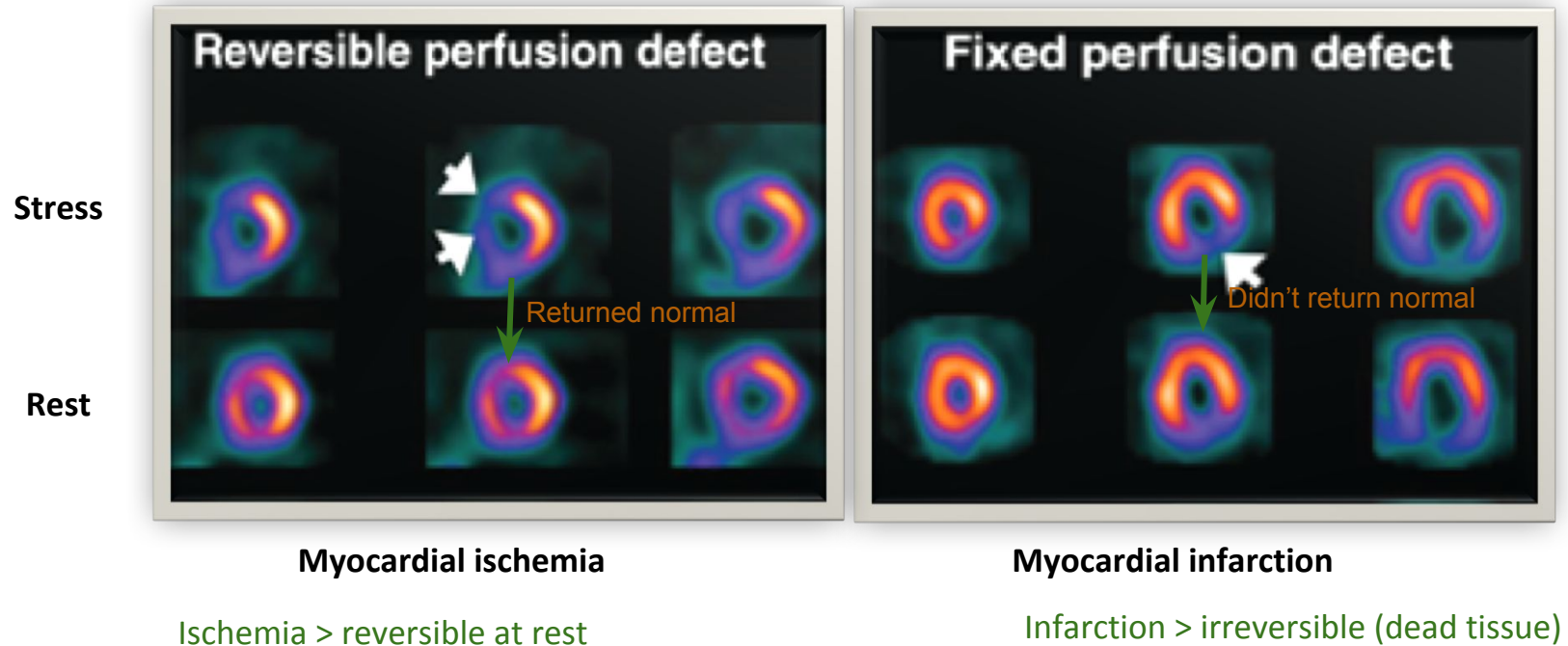


- CT pulmonary angiogram is the gold standard exam to diagnose PE.
- The most common x ray finding in PE is "NORMAL".

What is the diagnosis?



What is the diagnosis?



End of the lecture, best of luck.
Don't forget to give us your feedback.

WE NEED
YOUR 
FEEDBACK