

Do You See What I see?? CXR for the PCP

Skin, Bones, Hearts, & Private Parts

by
Christopher Hemmer, DNP, ANP, ONP-C, FAANP



SAINT LOUIS
UNIVERSITY

Objectives

- ▶ Participants will be able to identify normal form abnormal CXR
- ▶ The learner will be able to identify key landmarks on the radiograph



Conflict of Interest

I have no financial interest or conflict related to the topics of this presentation

Chest X ray

Remember all x-ray are a presentation of density

Black: Air. No density of absorption

Dark Grey: fatty tissue. Little more absorption than air but not as much as muscle/ bone

Light Grey: Muscle/ soft tissue. More dense than air and fat

White: Hopefully bone. Can be less dense with osteopenia

Bright White: Metallic pacemaker/ clips/ FB

PA view (ambulatory patient) is the patient facing the cassette x-ray machine from behind (preferred for optimal chest imaging due to heart and mediastinum being more anterior in position) true image. The closer to the plate the truer the size of the object

AP (ICU patient) cassette behind the patient (magnifies heart/mediastinum) Makes them appear larger than they are!

Lateral provides you better idea of what is taking place behind the heart. Have the patient take a deep breath and hold unless looking for PTX

CXR normal anatomy

Bone

Clavicle

Proximal Humerus

Scapula

Ribs

Vertebrae

Soft Tissue

Trachea

Hilum

Lungs

Diaphragm

Heart

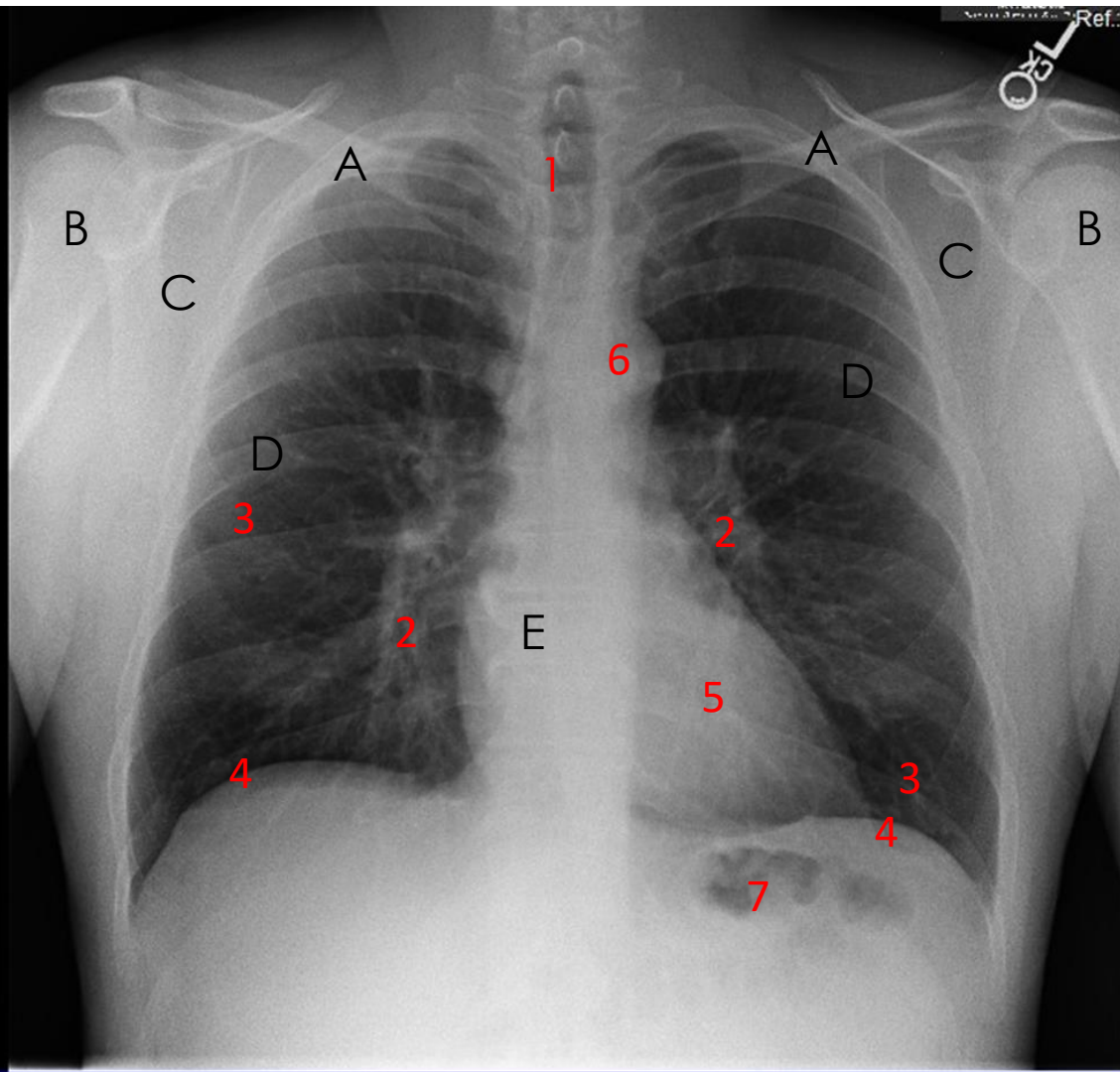
Breast

Vessels

7

Bone

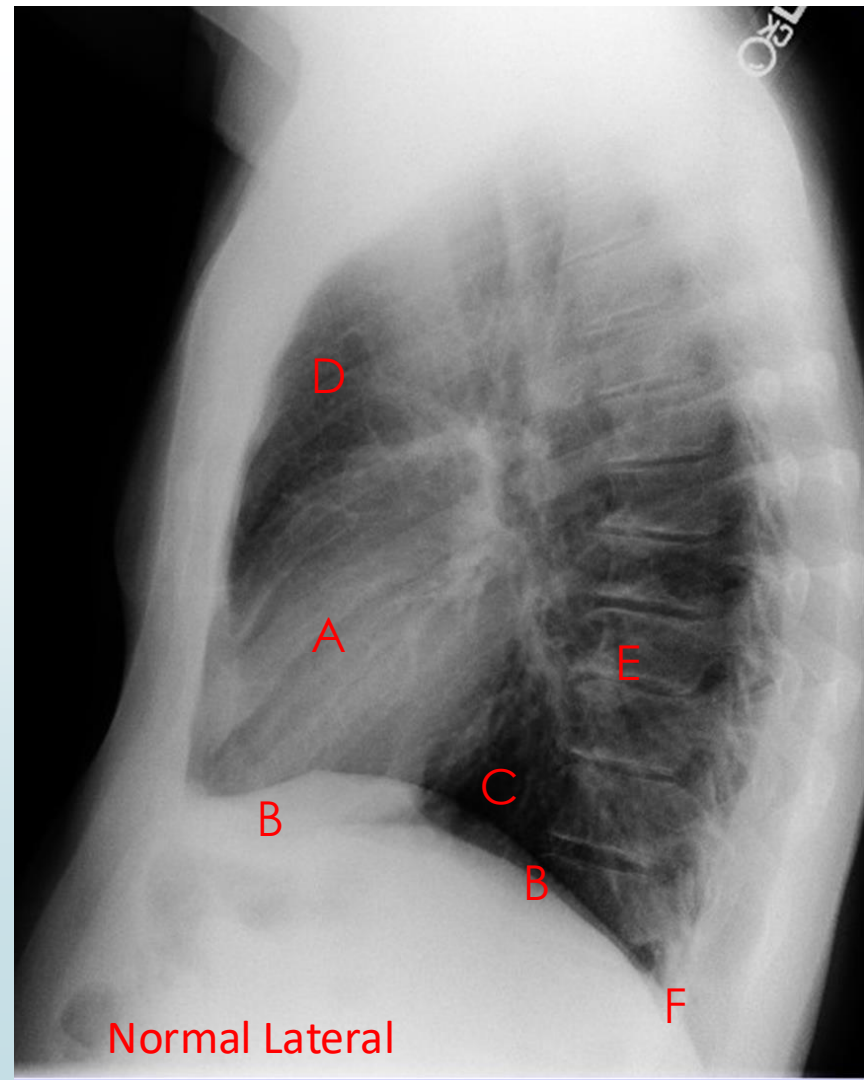
- A. Clavicle
- B. Proximal Humerus
- C. Scapula
- D. Ribs
- E. Vertebrae



Soft Tissue

- 1. Trachea
- 2. Vascular Hiilm
- 3. Lungs
- 4. Diaphragm
- 5. Heart
- 6. Vessels
- 7. Gas Bubble stomach

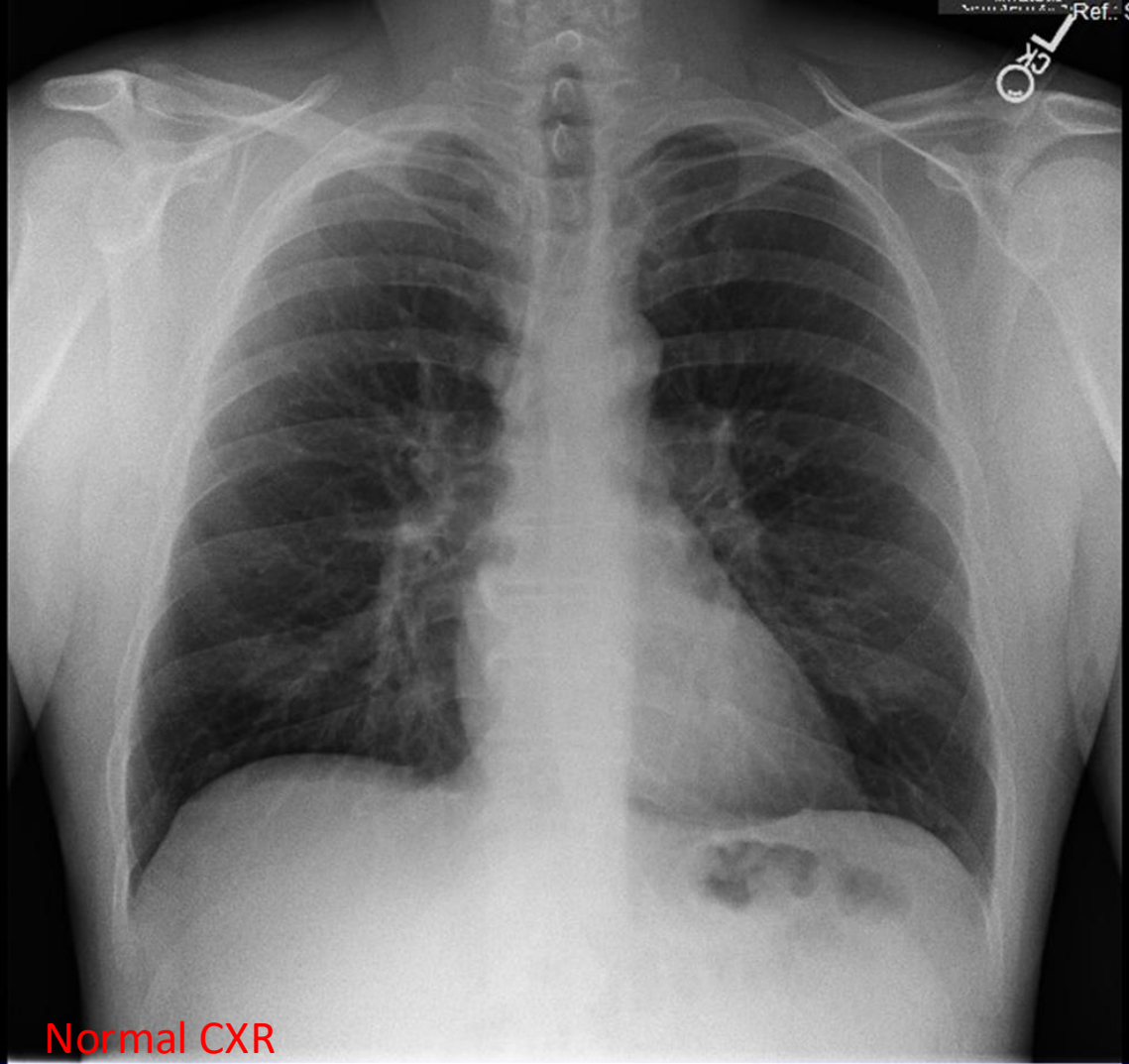
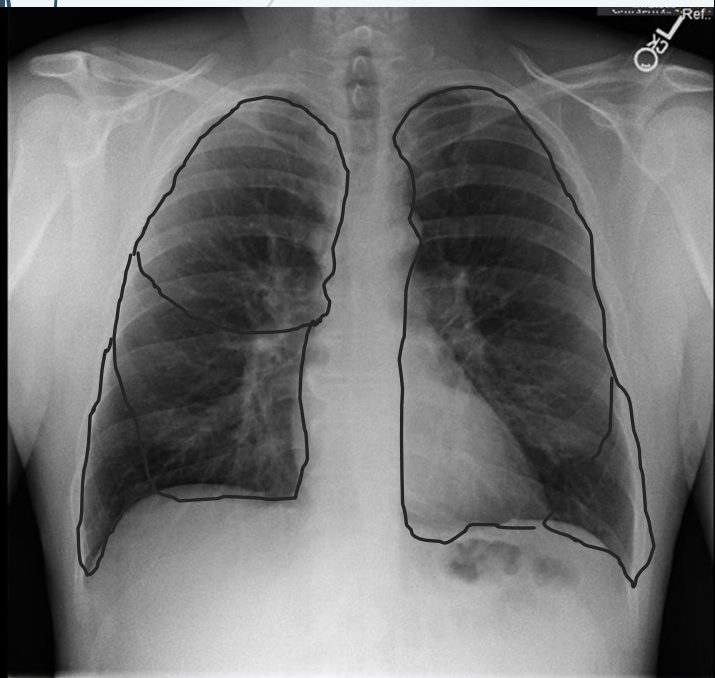
- A: Heart
- B: Diaphragm
- C: Retro cardiac space
- D: Retro-sternal space
- E: Vertebral bodies
- F: Costovertebral junction



9

Right lung has 3 lobes

Left Lung has 2 lobes



Normal CXR

RIPE FILM

10

“R” rotation: The film needs to be straight. The spinous process should be equal distance from the medial heads of the clavicles

“I” inspiration: A good degree of inspiration should have 6 anterior ribs visible above the right hemidiaphragm

“P” position: What is the position of the patient? Semi-erect/upright. Looking at the gas-fluid line in the stomach can help

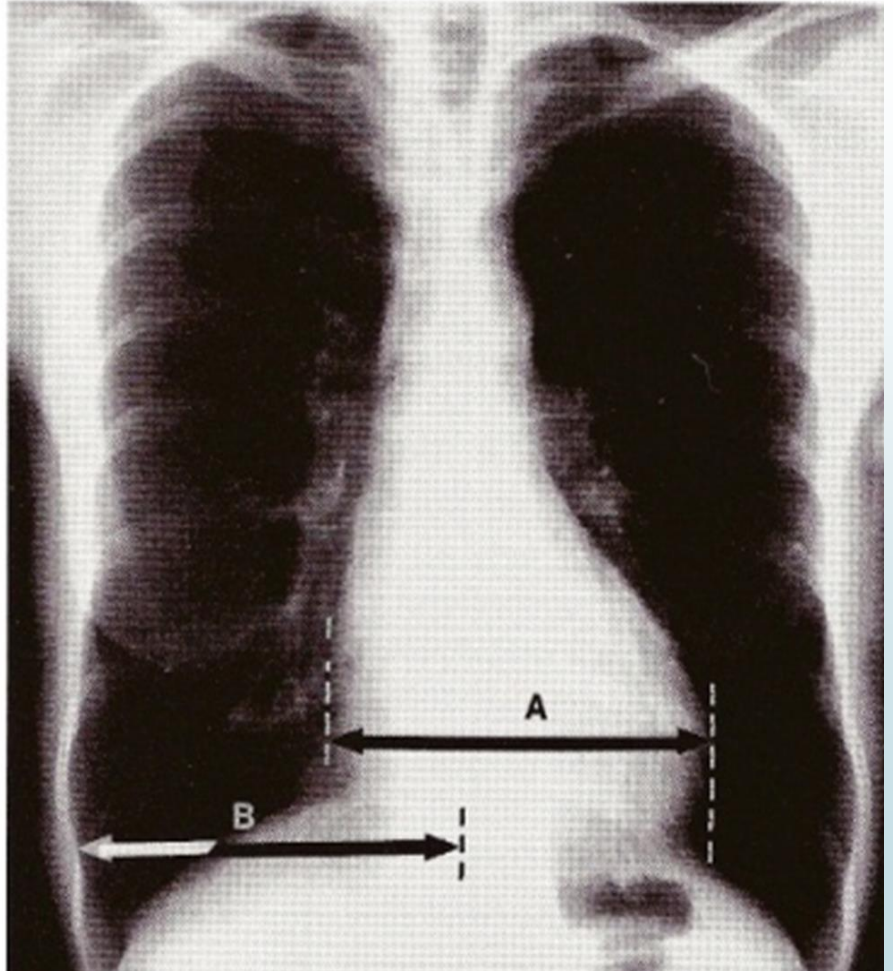
“E” exposure: (probably the most important). Too much or too little can lead to incorrect diagnosis. Digital x ray has helped some with this problem.

CXR Pearls

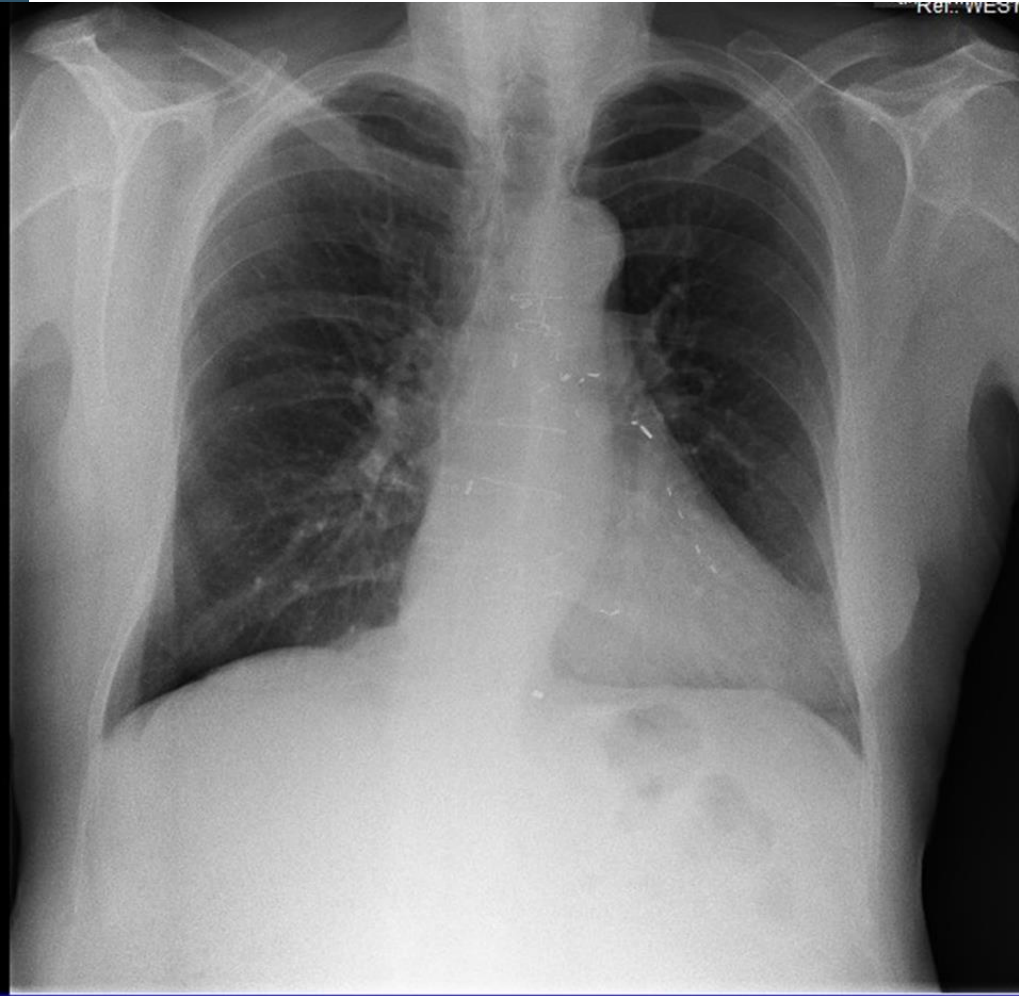
- *Asthma flare*: Hyperinflated & flat diaphragm
- *COPD*: Hyperinflated, blunted costophrenic angles & increased AP diameter
- *Spine Sign*: Vertebral bodies should go from light to darker cephalad to caudal otherwise think infiltrate

How to look for Cardiomegaly

Cardiomegaly:
Measure heart @
widest point.
Should be less than
half of hemithorax
when measured
from mid spine to
ribs.



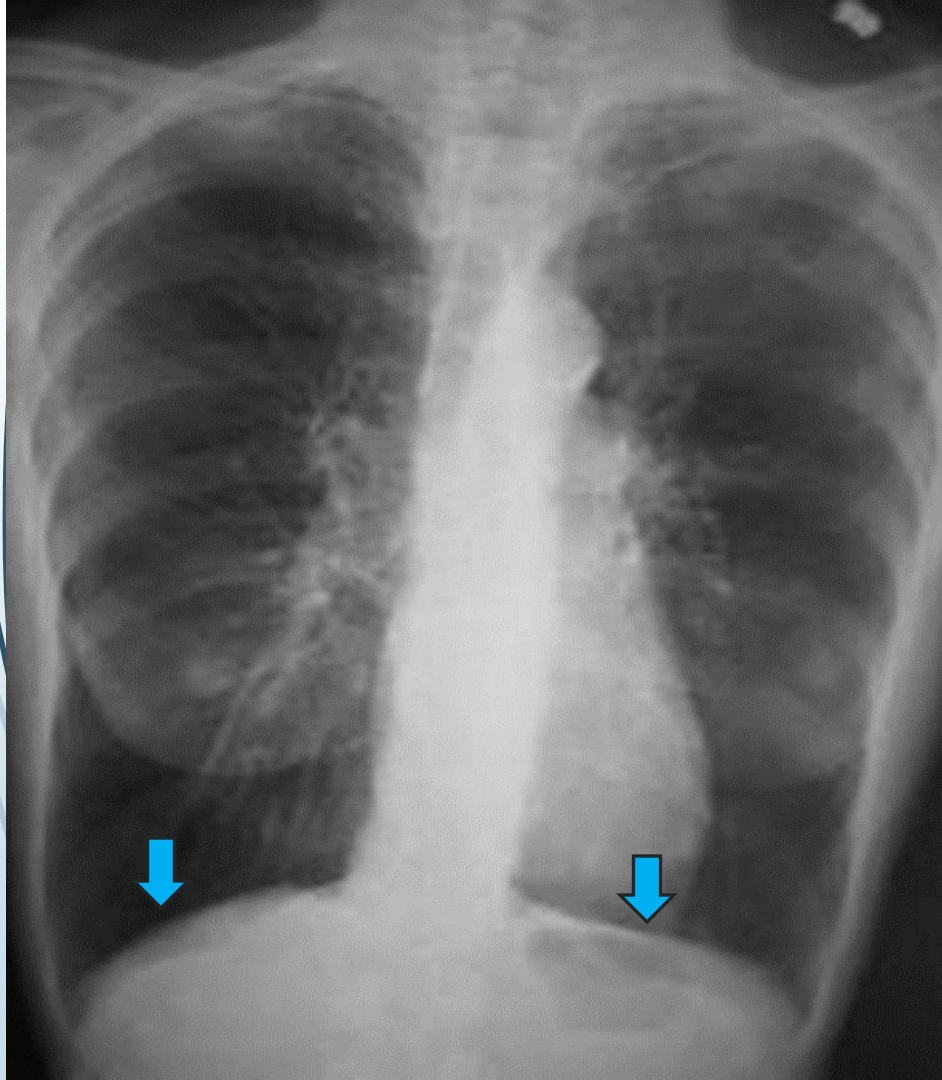
Cardiomegaly



COPD

14

- Hyperinflated
- Significant flattening diaphragm
- Marked AP diameter (barrel chested)
- Costophrenic angles may be blunted
- Take a deep breath...hold no take another w/o expiration



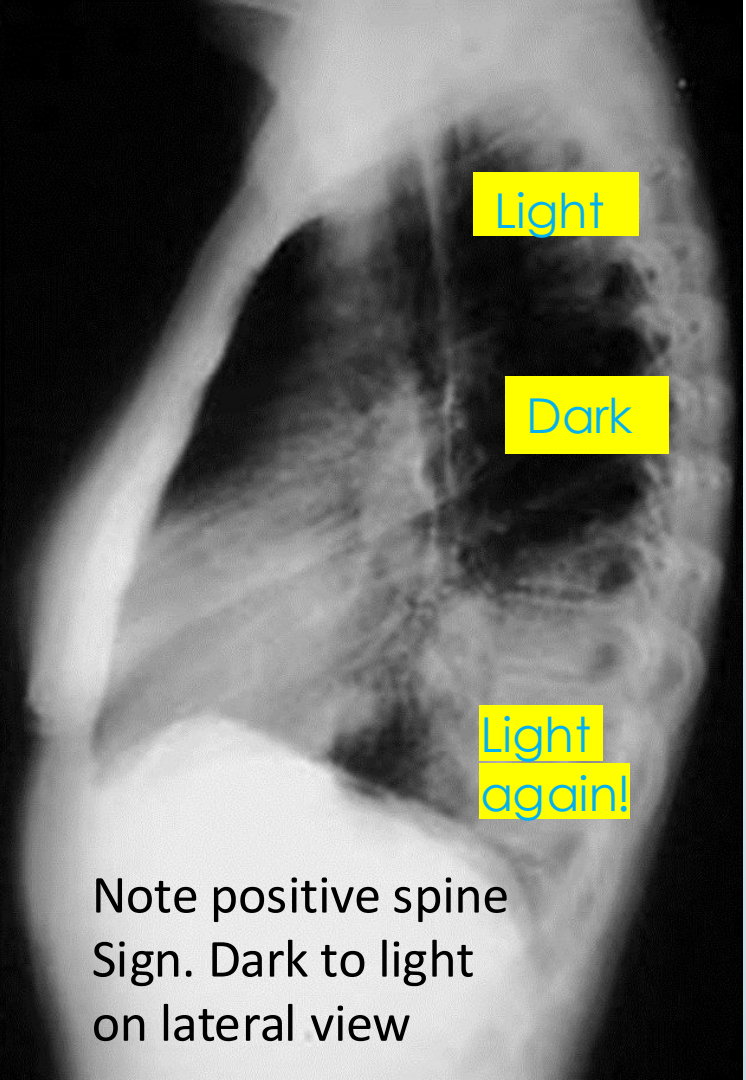
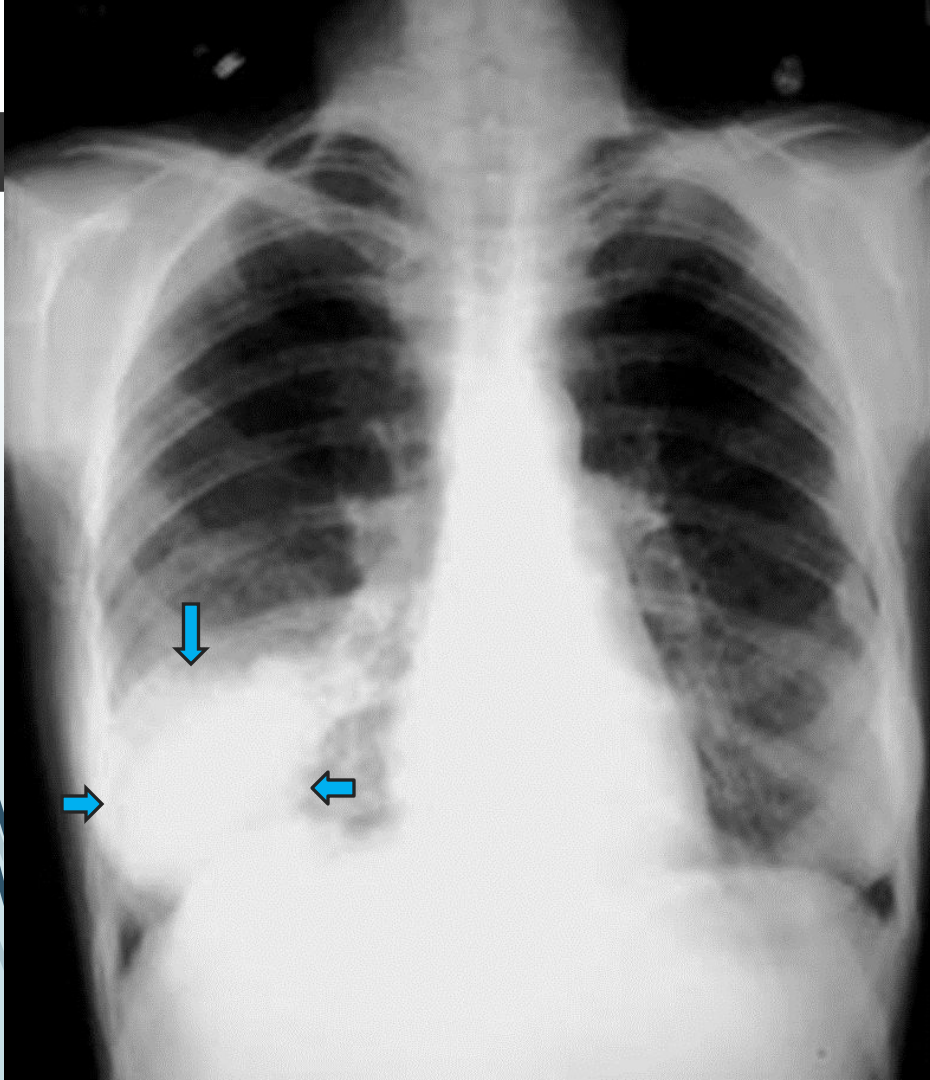
- **Asthma Flare**

- Acute asthma flare will be hyperinflated, flat diaphragm
- Hyperinflated
- Mild flattening of diaphragm
- No blunting costophrenic angles
- Normal AP diameter (no barrel chest)

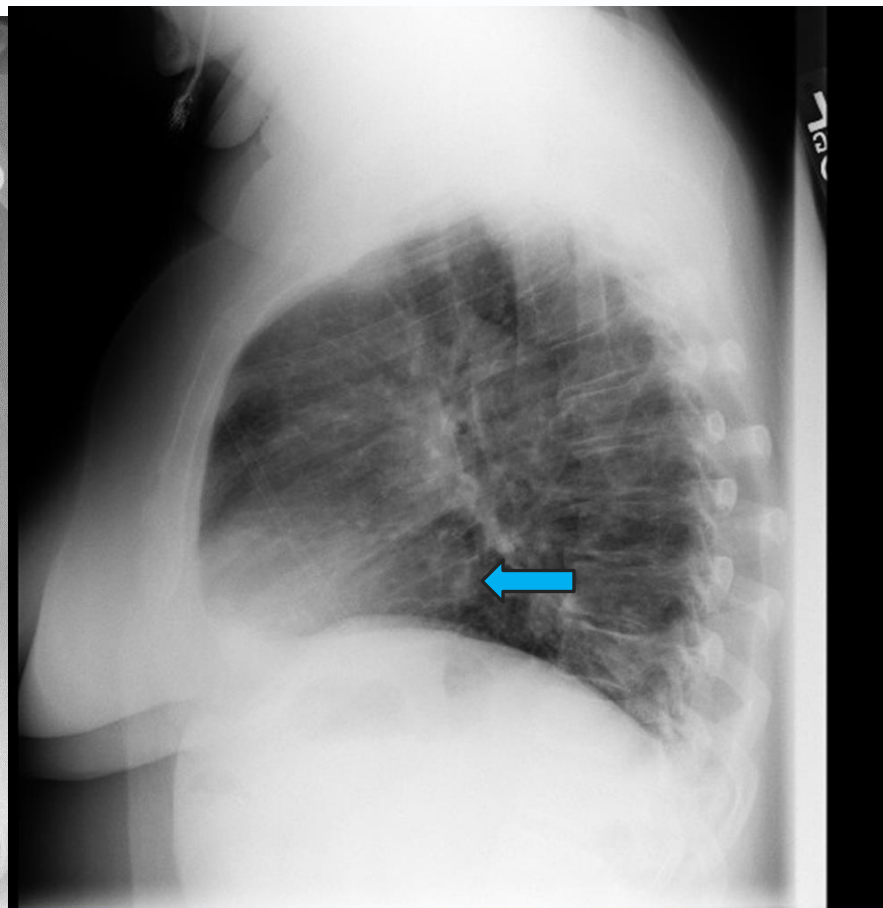
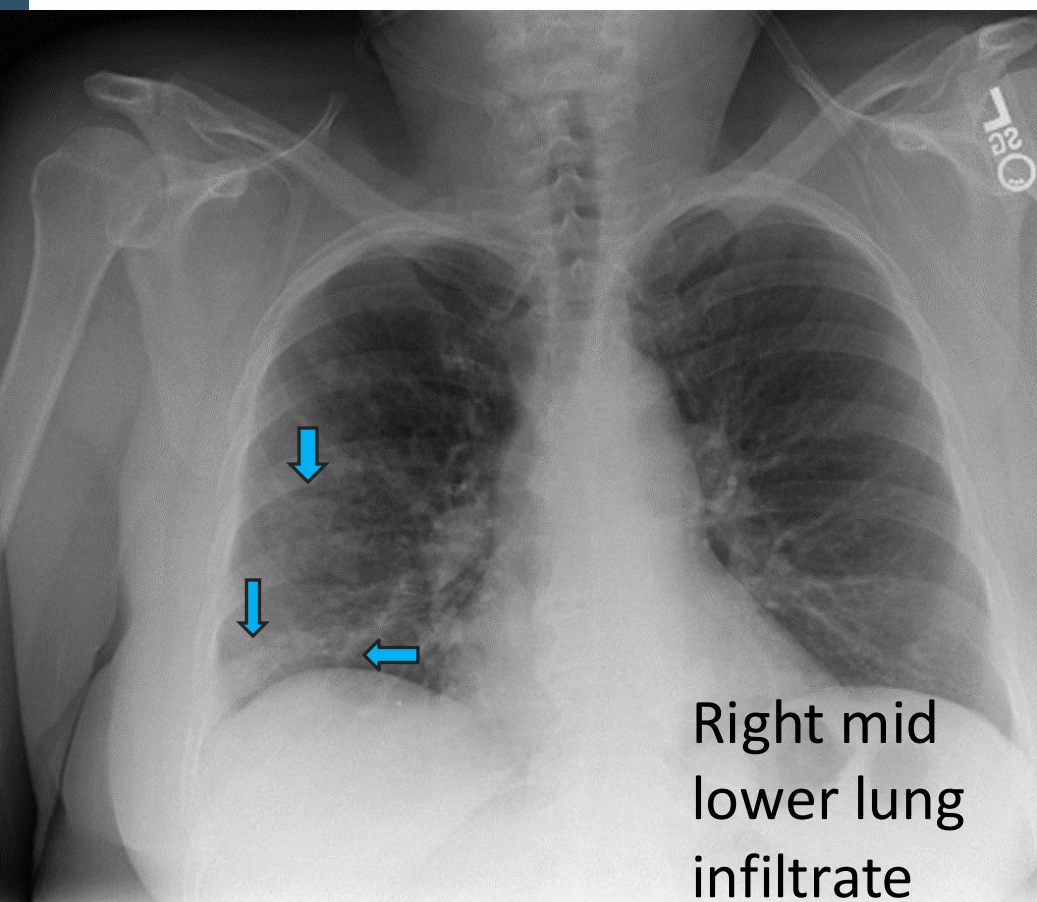


Infiltrates

- Opacities that will appear lighter gray or white on CXR.
- Follow up CXR 3-4 weeks post treatment to document resolution
- Remember clinical correlation and history

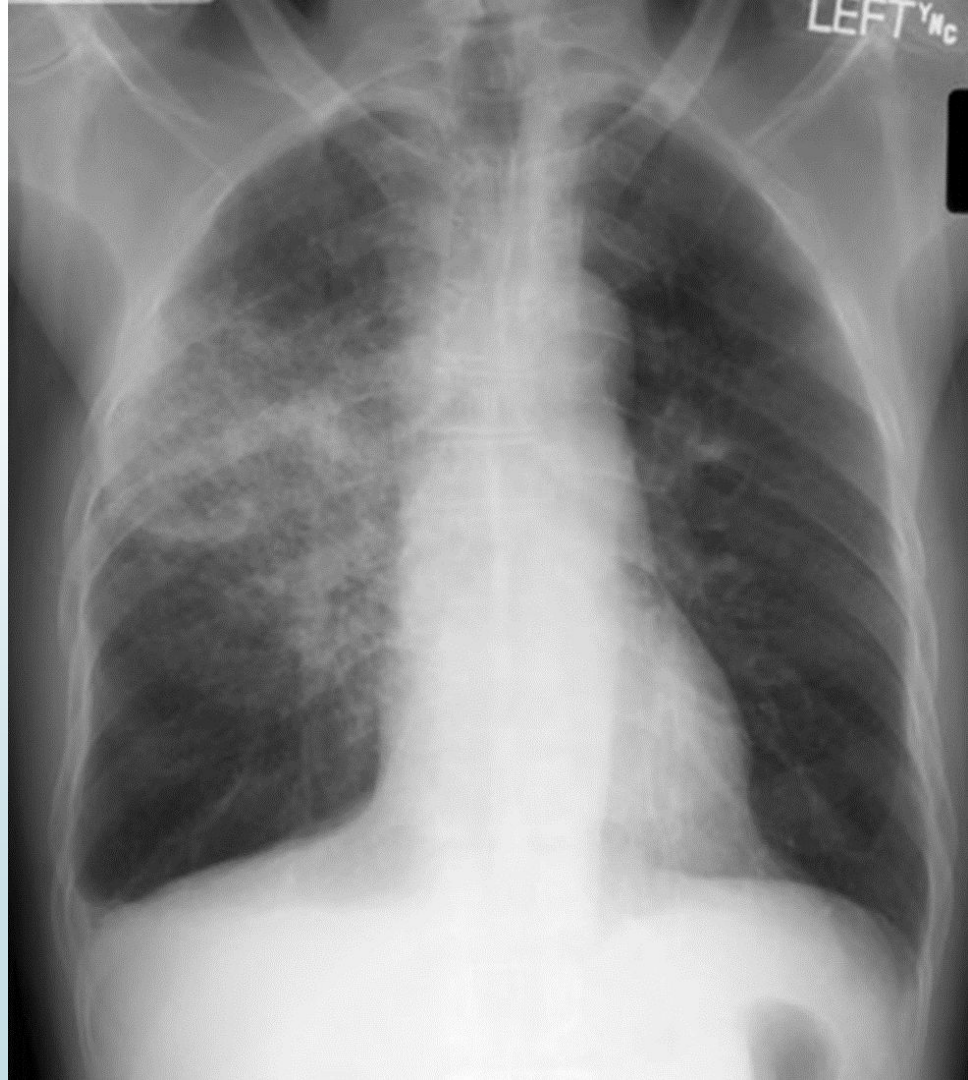


Note positive spine
Sign. Dark to light
on lateral view



21

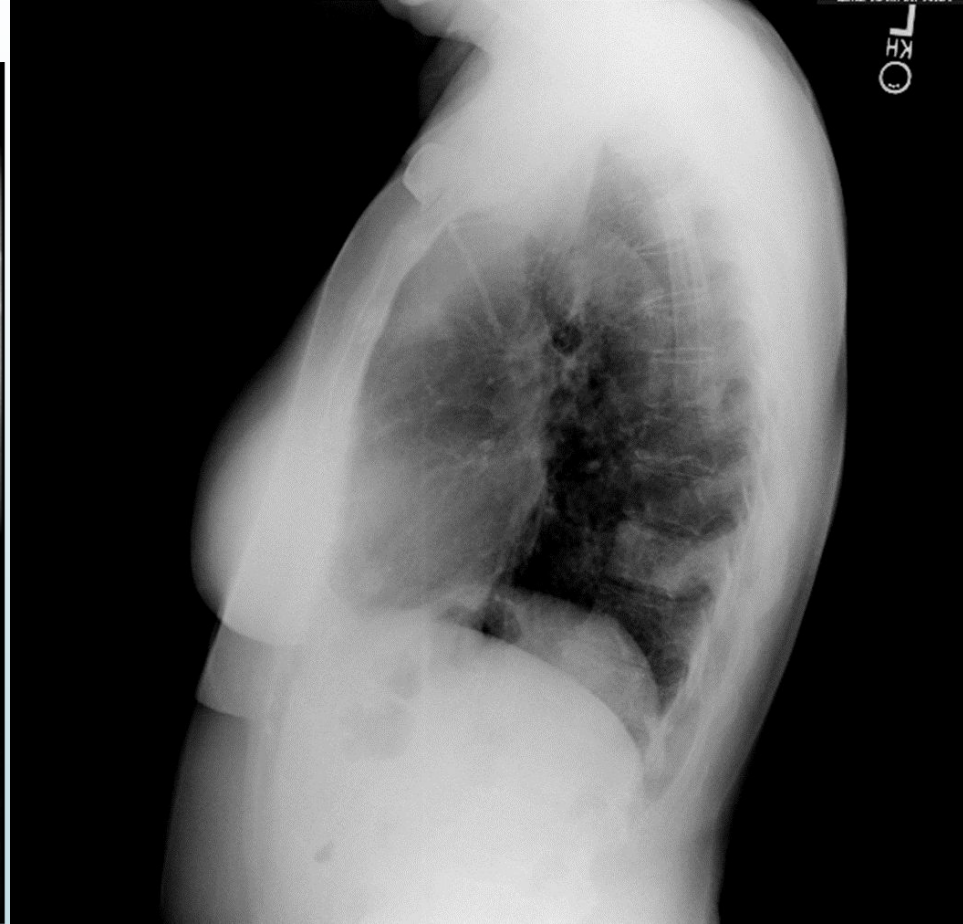
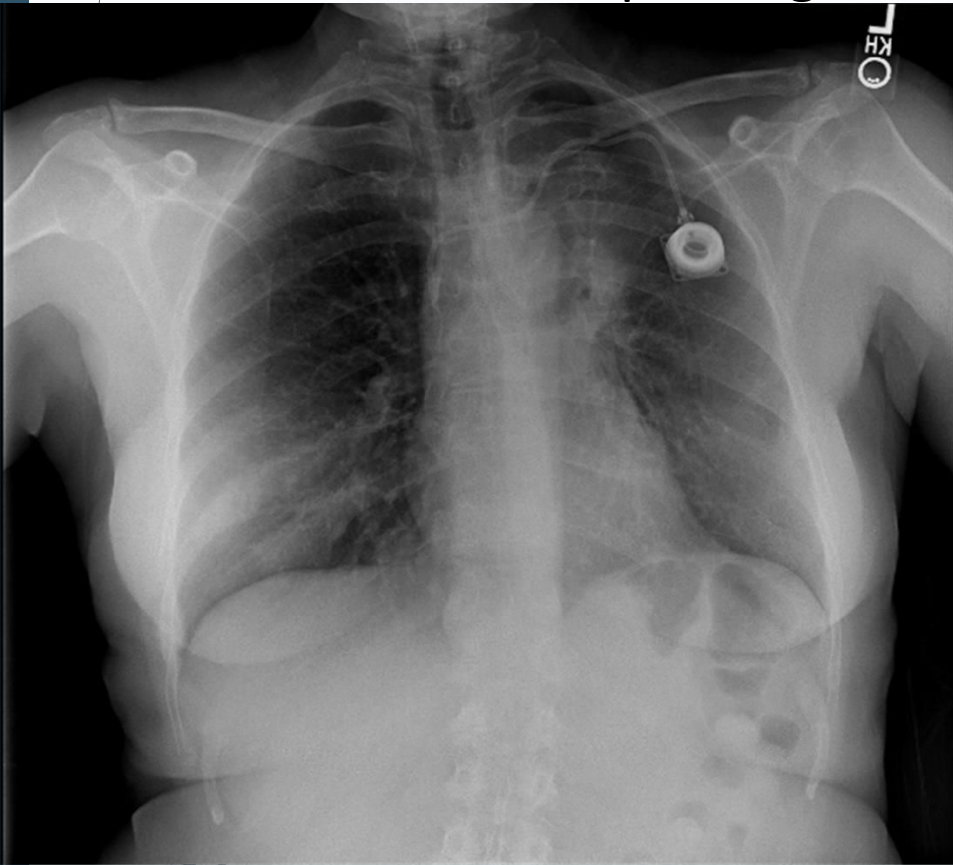
Note right
upper/middle lobe
infiltrate as well as
blunting of the
costophrenic angle



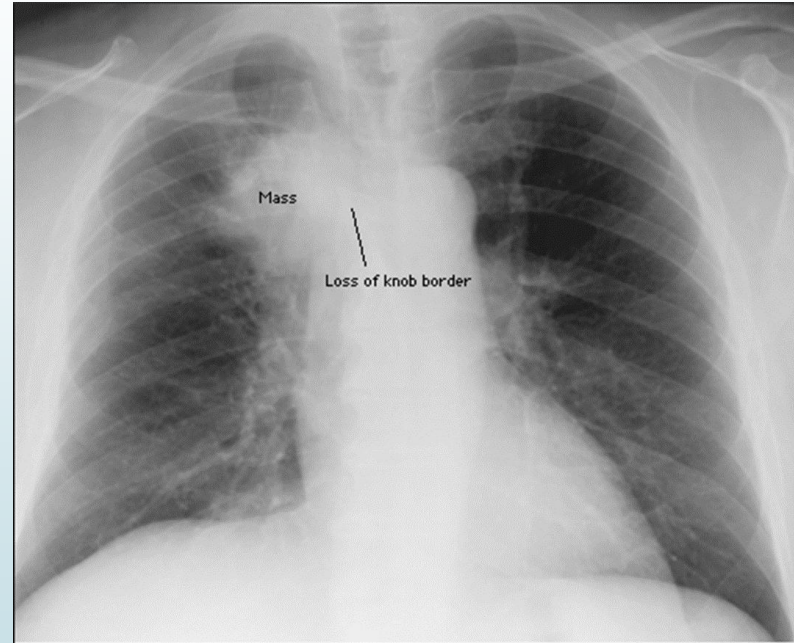
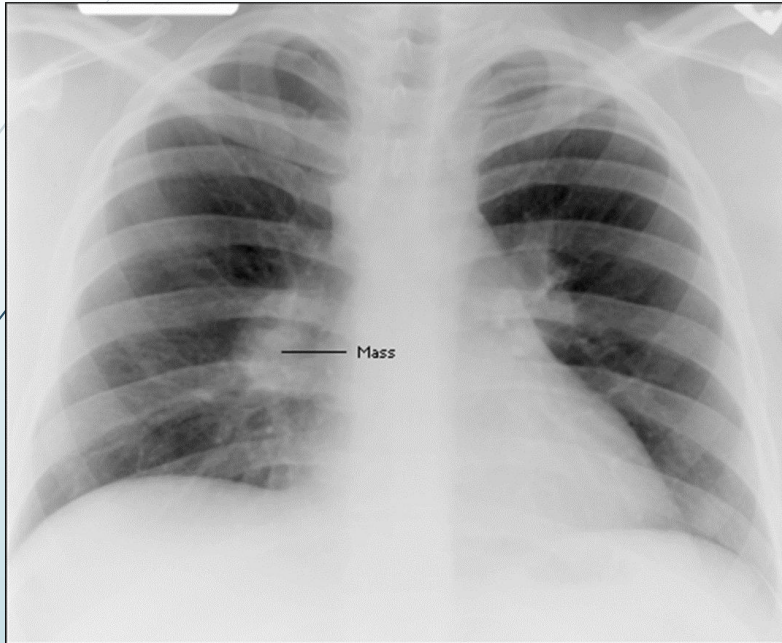


23

What do you think?
Remember Spine sign?

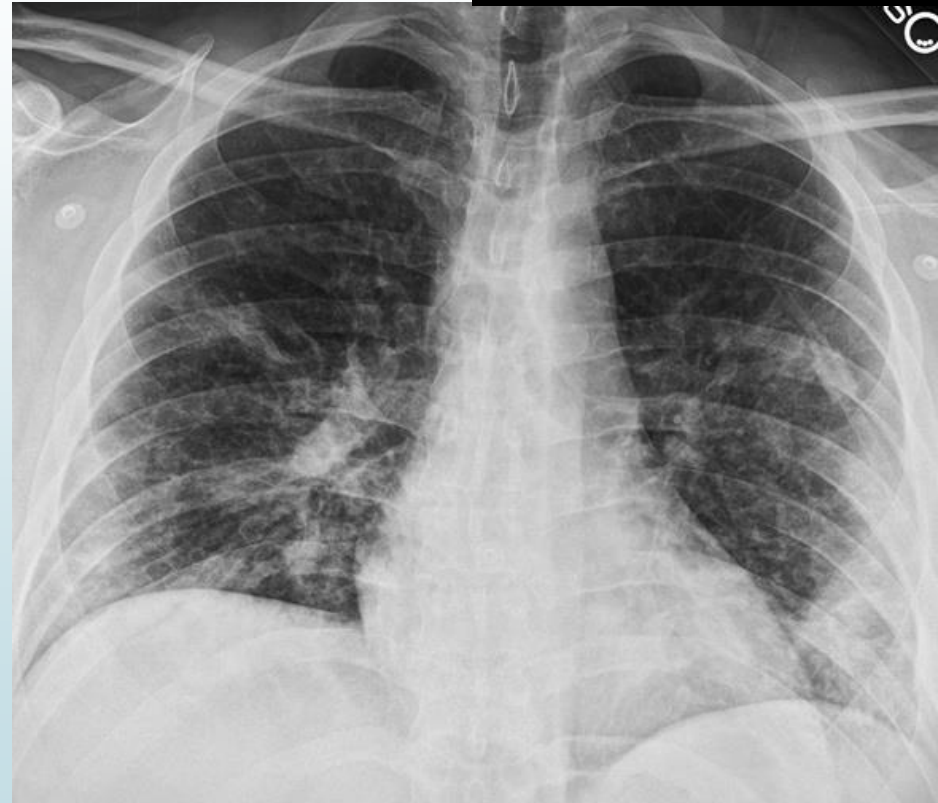
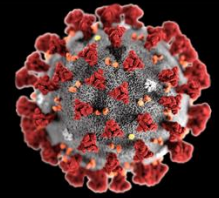


More infiltrates (tumor)

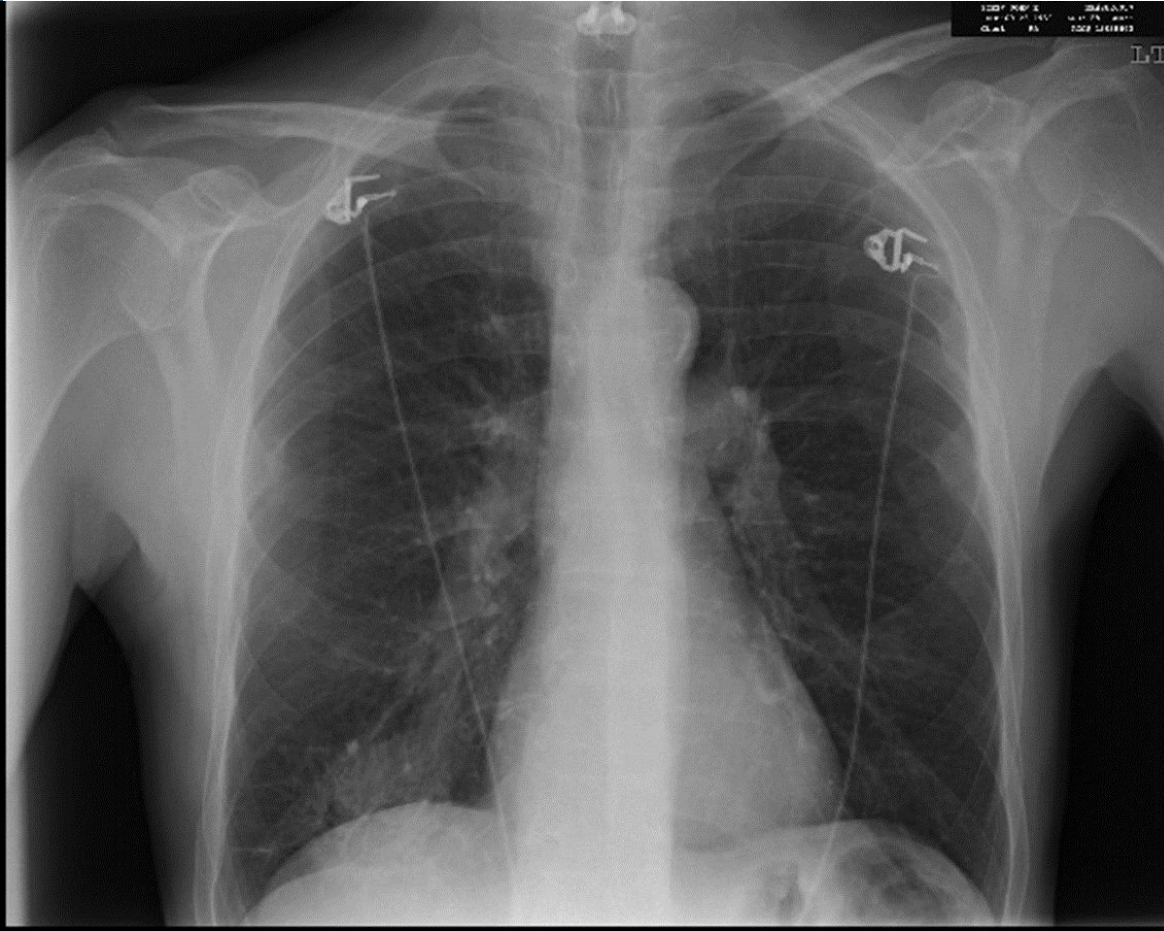


What would a talk be without COVID?

- Multifocal peripheral consolidation
- Rounded opacities and nodules
- Similar appearance to pneumonia, influenza, and connective tissue disease
- In COVID this presents early in the disease process



Case Study



55 y/o smoker.

ER productive cough, low grade fever for 48 hours.

No night sweat or weight loss



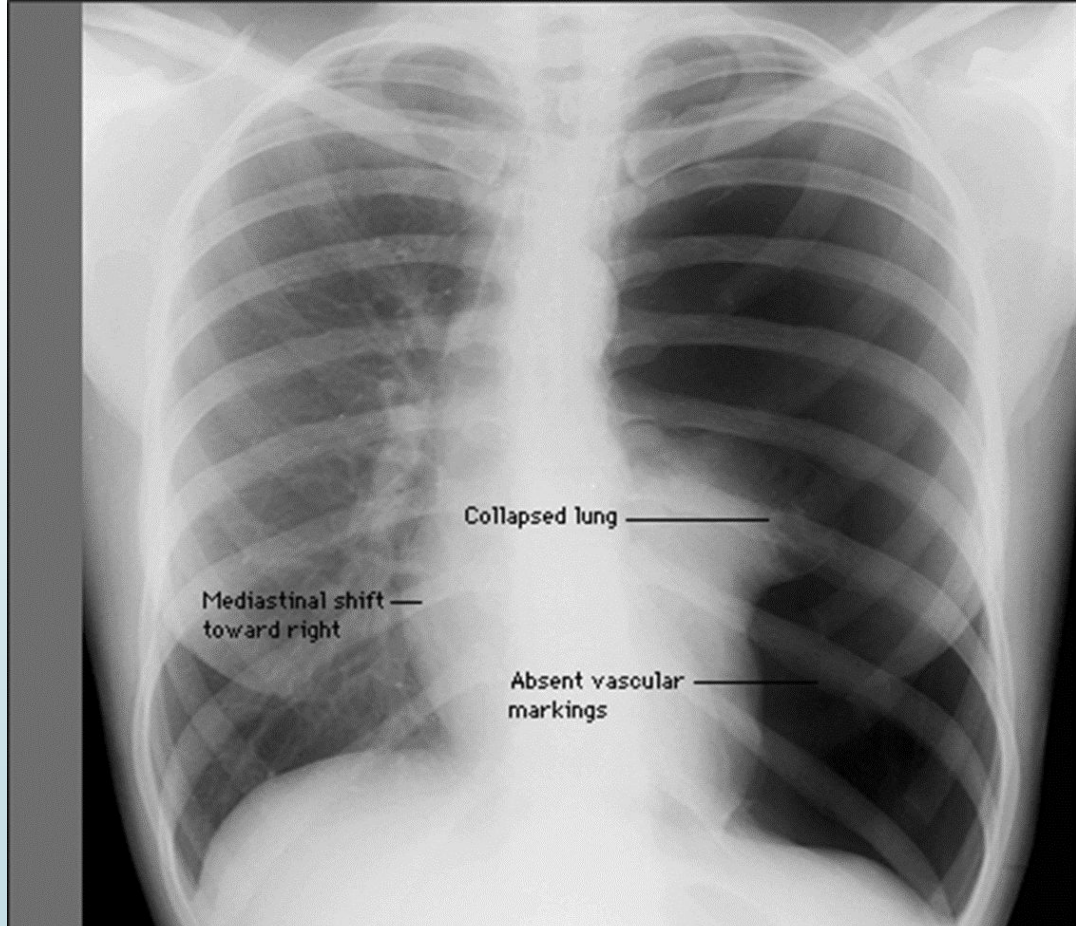
Patient treated with antibiotics and sent home. Symptoms improved. Never followed up as directed for CXR. 4 months later has on going cough and this CXR was obtained

Pneumothorax

Pneumothorax

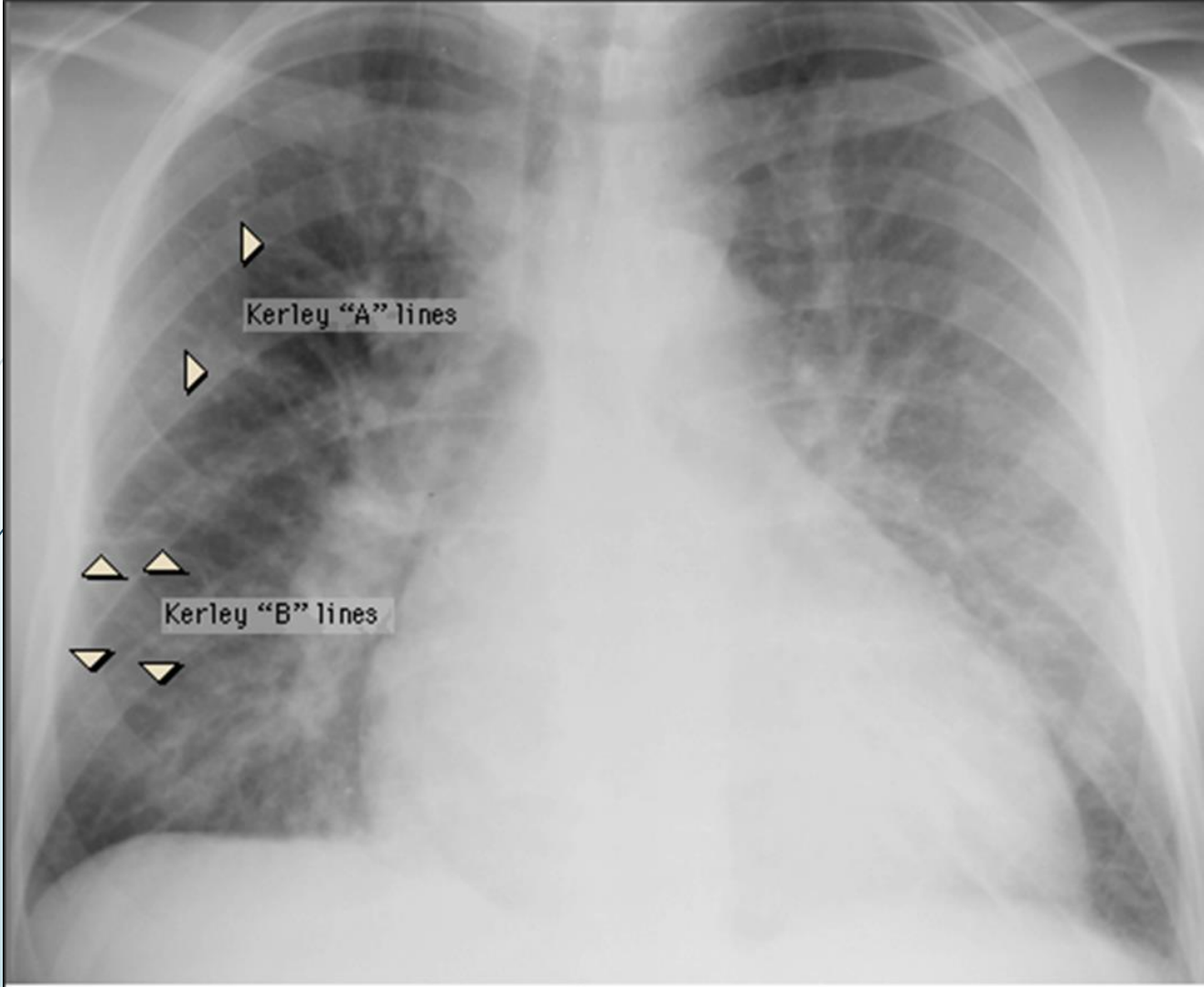
Can be traumatic
(blunt/
penetrating)

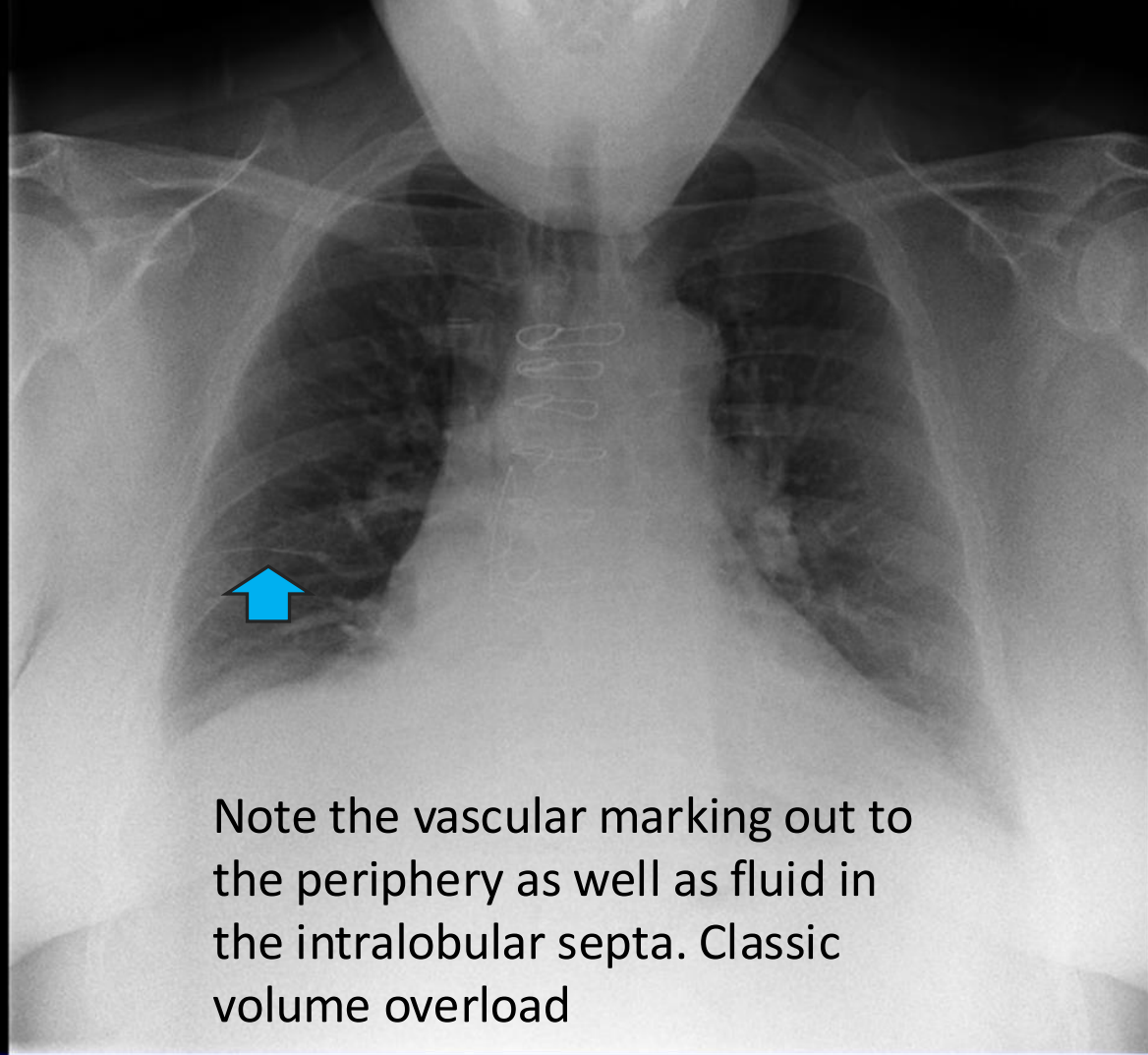
Can be
spontaneous
(seen in young,
tall, and thin
teens/ 20's). Seen
mostly in upper
lobes



CHF

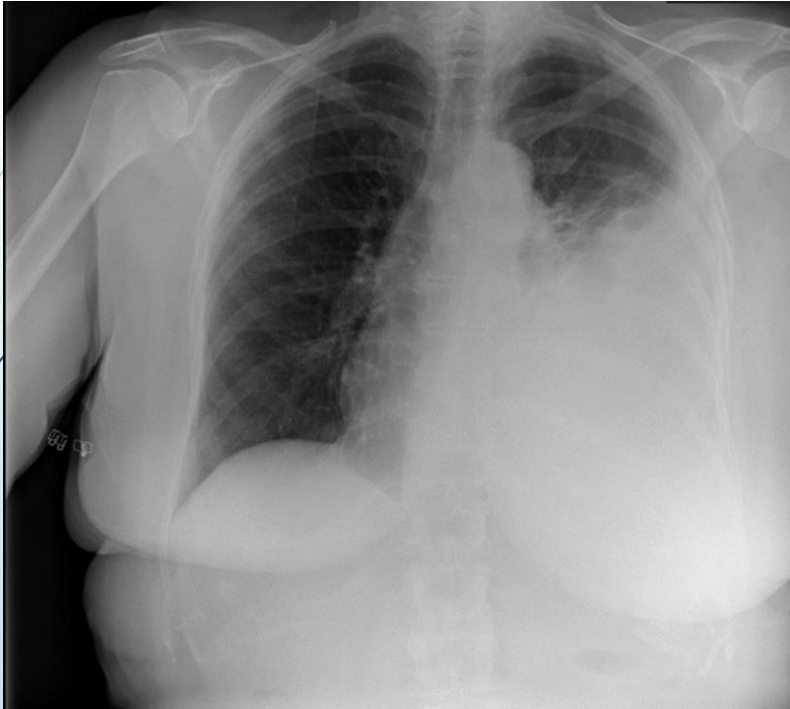
Early findings include presence of Kerley B lines (small horizontal lines found in the very periphery of lung near the rib). These lines represent fluid in the interlobular septa. These should not be mistaken for blood vessels as you should not see lung markings in peripheral $\frac{1}{4}$ lung.

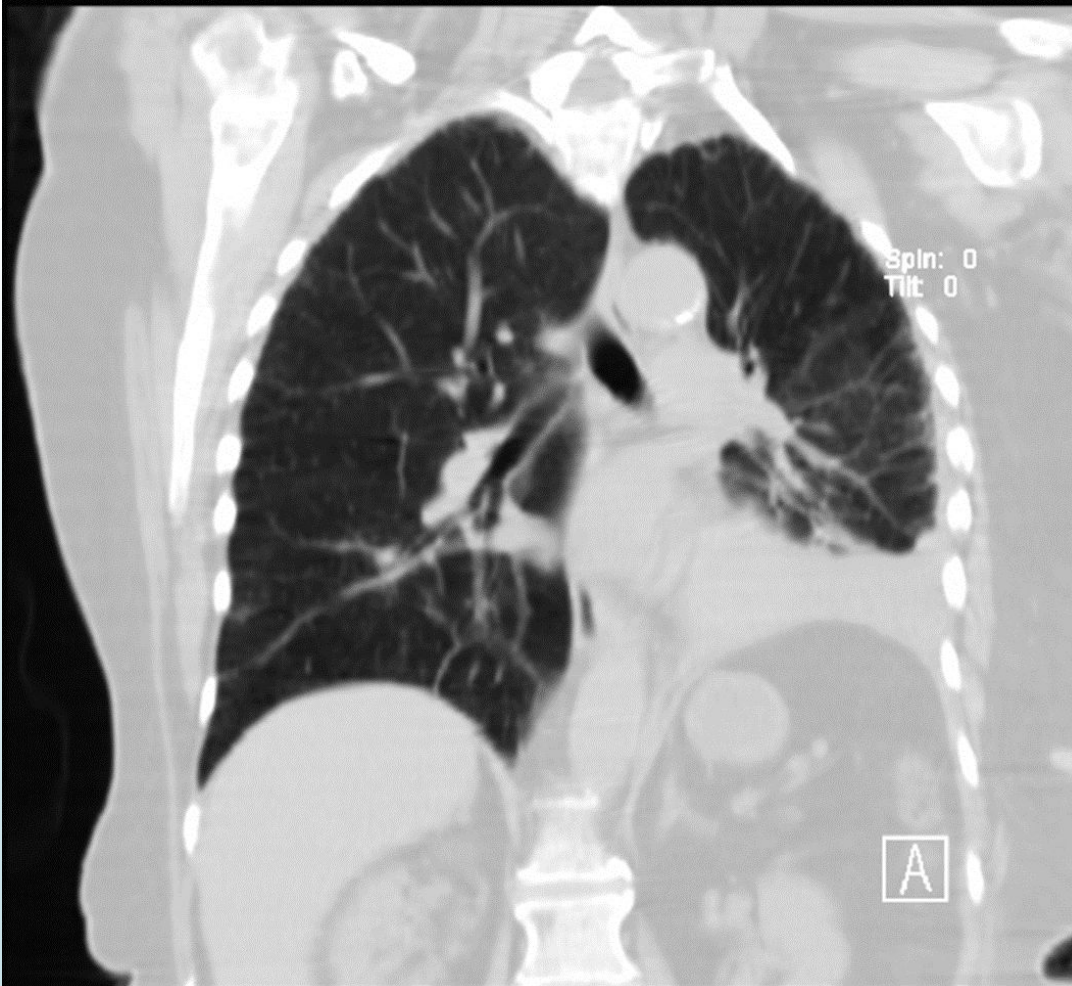




Note the vascular marking out to the periphery as well as fluid in the intralobular septa. Classic volume overload

Pleural Effusion

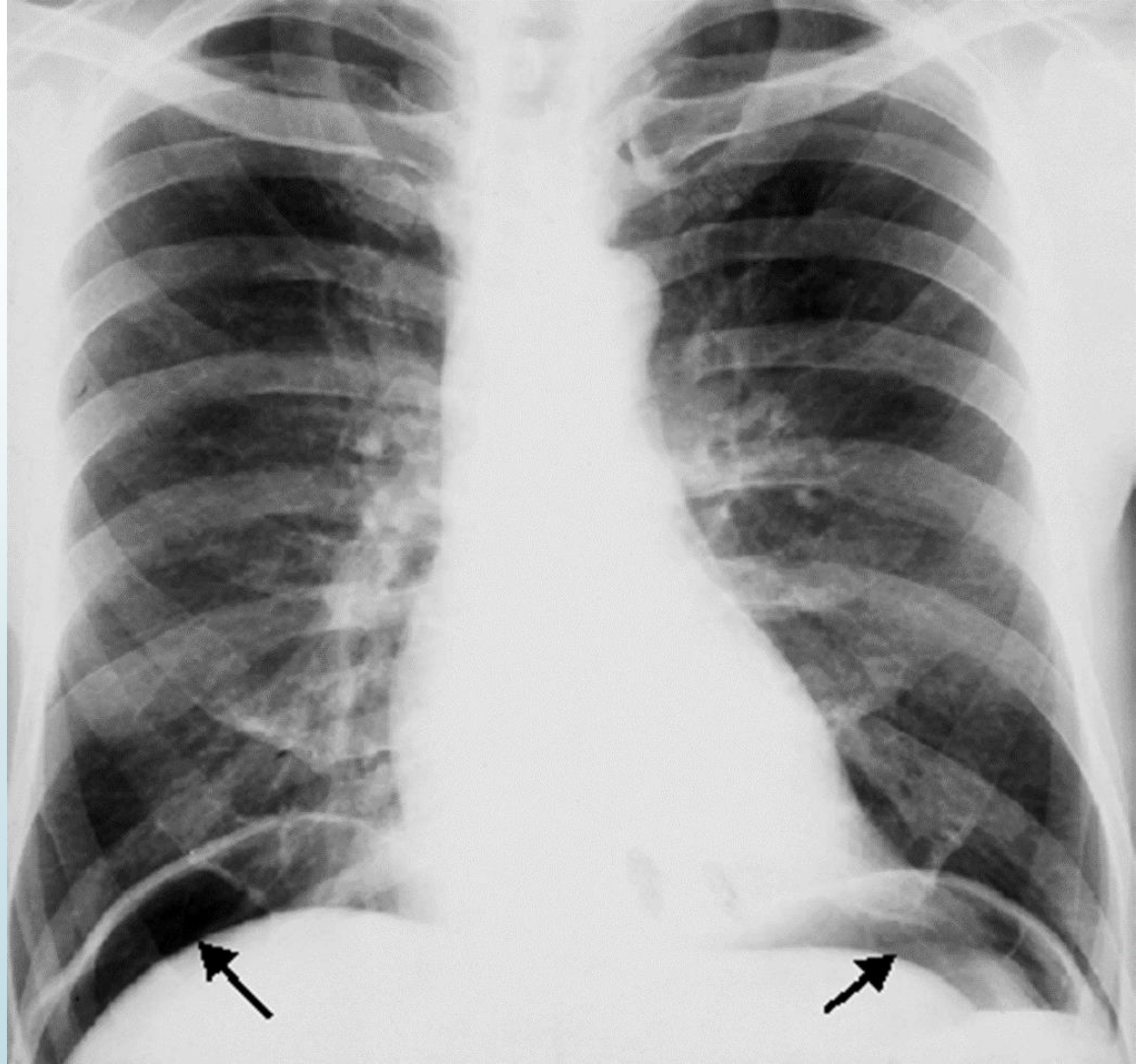




CXR diagnosis

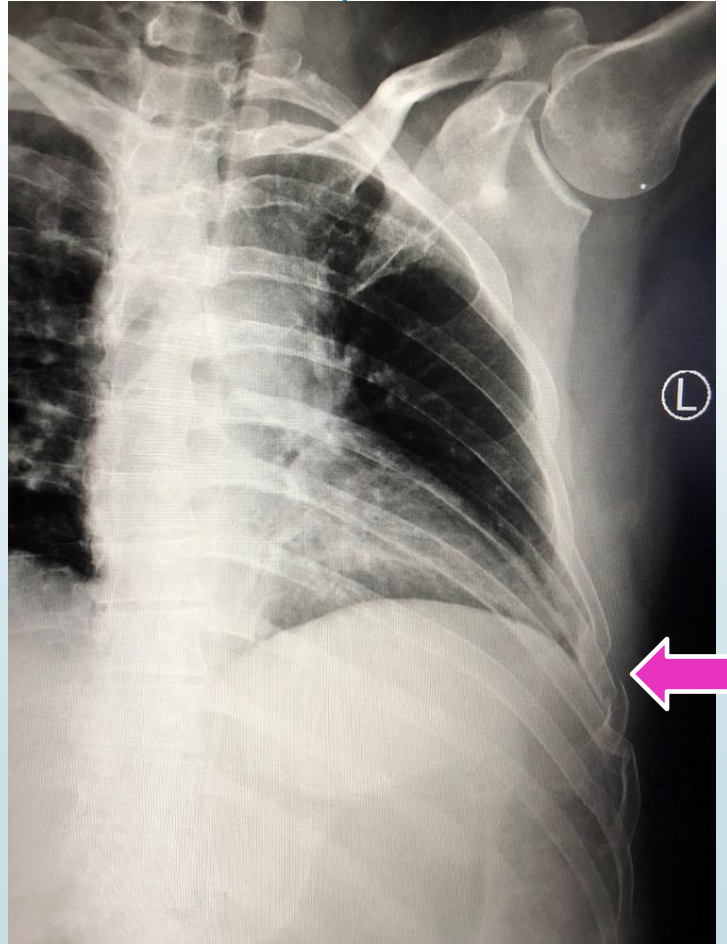
Remember that CXR can also demonstrate other pathology other than heart and lung. We commonly see huge hiatal hernia, vertebral fracture, clavicle, shoulder pathology, line/ tube placement

What surgical emergent problem does this x-ray show of a patient who recently had a laparoscopic procedure?



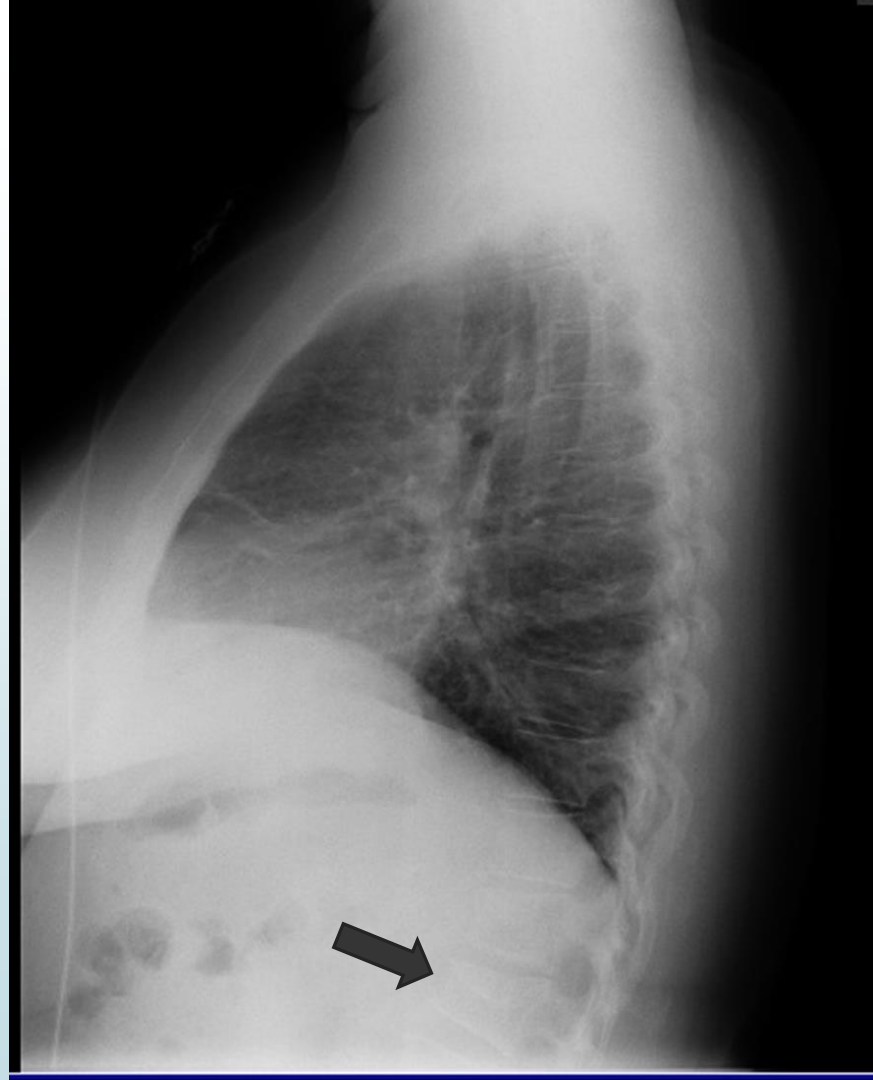
MVA with rib pain

36



VCF Thoracolumbar spine DX on CXR

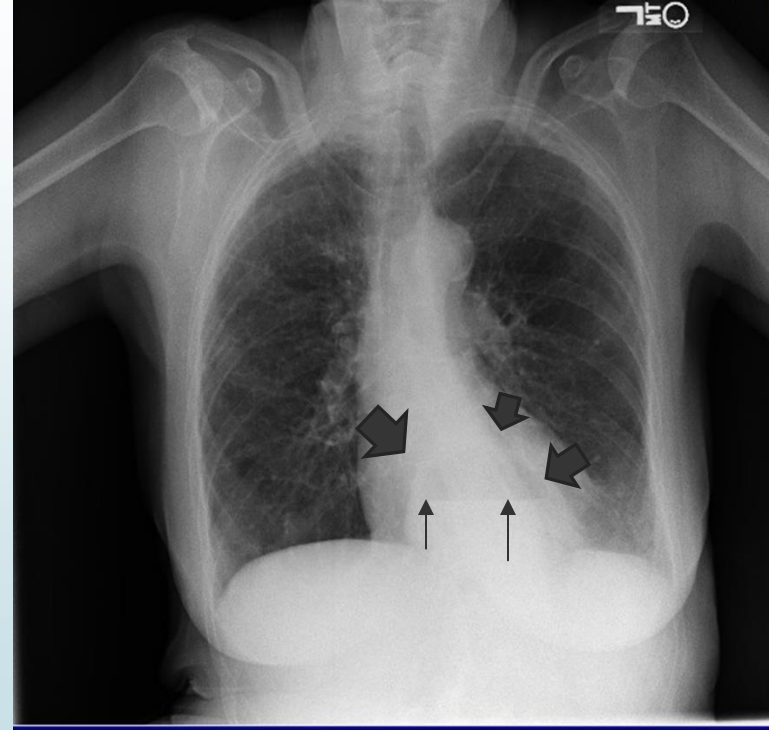
37



Large Hiatal Hernia

38

Notice the large air fluid level



References

39

Consultant, Sept 1, 2007. vol 47

Corne J, Carroll M, Brom L, Delany D(1998): Chest x ray made easy. Churchill Livingstone, Edinburgh.

Jenkins P(2005): Making sense of CXR a hands on guide. Hodder, Arnold, London

Mettler, F. (1996). Essentials of Radiology (1st ed). W.B. Saunders Company

Campo, T (2017). Medical Imaging for the Health Care Provider

Questions or
comments?
Please feel free to
email me
[chrishemmernp@
gmail.com](mailto:chrishemmernp@gmail.com)

