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

Skin, Bones, Hearts, & Private Parts

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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 | <u>Soft Tissue</u> |
|------------------|--------------------|
| Clavicle | Trachea |
| Proximal Humerus | Hilum |
| Scapula | Lungs |
| Ribs | Diaphragm |
| Vertebrae | Heart |
| | Breast |
| | Vessels |





Soft Tissue

- 1. Trachea
- 2. Vascular Hiulm
- 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









RIPE FILM

"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 heat @ widest point. Should be less than half of hemithorax when measured from mid spine to ribs.



Cardiomegaly



- 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



Light

Light again!

Note positive spine Sign. Dark to light on lateral view





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





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 finding 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 ¼ lung



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







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



VCF Thoracolumbar spine DX on CXR

Large Hiatal Hernia Notice the large air fluid level



References

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Campo, T (2017). Medical Imaging for the Health Care Provider Questions or comments? Please feel free to email me chrishemmernp@ gmail.com

