As Easy as Black & White CXR Interpretation

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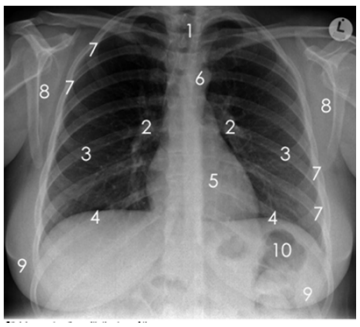
Chest x-ray anatomy



1 - Trachea
2 - Hila
3 - Lungs
4 - Diaphragm
5 - Heart
6 - Aortic knuckle
7 - Ribs
8 - Scapulae
9 - Breasts
10 - Bowel gas

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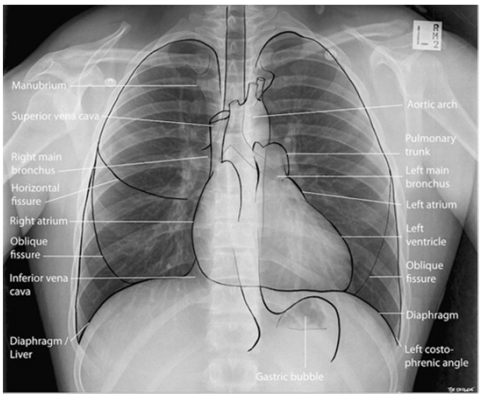

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Clinical Findings that show up ***White***

- Pulmonary Edema
- Pneumonia
- Pleural Effusion
- Atelectasis
- ARDS
- Tumors
- Pericardial effusion/cardiac tamponade

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Pulmonary Edema

- Fluid in the pulmonary vasculature
- Will appear white on CXR
- Butterfly or batwing pattern
- Kerley B lines: thin linear pulmonary opacities caused for fluid or cellular infiltration into the interstitium of the lungs
- Treatment:
  - Diuretics

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Pulmonary Edema

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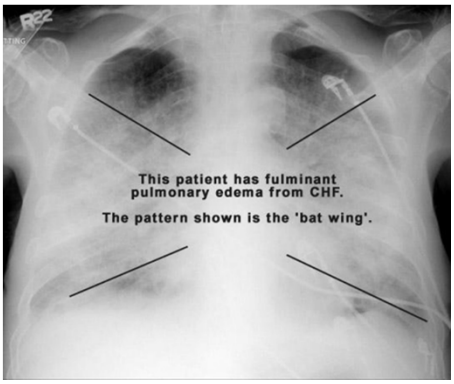

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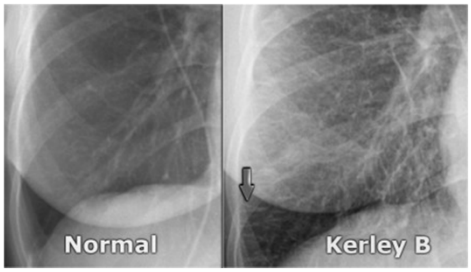
- Kerley B Lines -- Horizontal lines < 2 cm long found in the lower zone periphery
- These lines are the thickened, edematous interlobular septa



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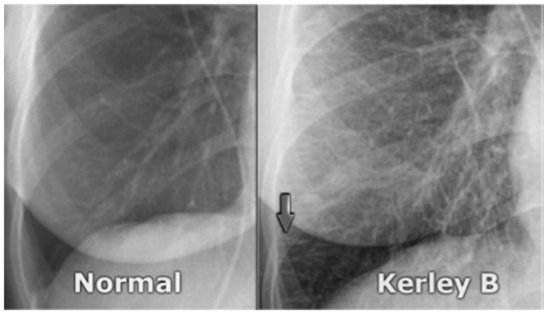

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Pneumonia

- A pattern of localize alveolar infiltrates
- May be localized to a single lobe or be more diffuse
- Will appear white on CXR
- Cause:
  - Infection
- Treatment
  - Antibiotics

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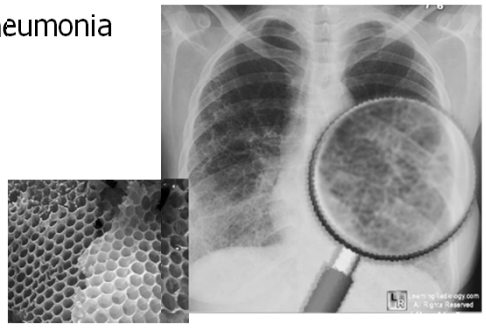
Pneumonia



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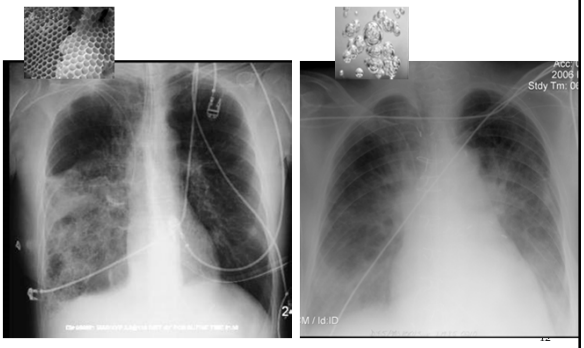
- Pneumonia
- Pulmonary Edema



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Pleural Effusion

- Fluid in the pleural space
- At least 200 – 300 ml must be present in the pleural space to cause costophrenic blunting
- Treatment
  - Chest tube or thoracentesis to remove the fluid

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Pleural Effusion

- Fluid will be white or greyish in color
- Expect to see white in the pleural space
- Fluid Levels:
  - An upright CXR will ensure that fluid levels will drop to the bottom of the cavity.
  - Fluid levels taken on a patient lying will displace the fluid laterally over the cavity and will therefore not be detected as a distinct line

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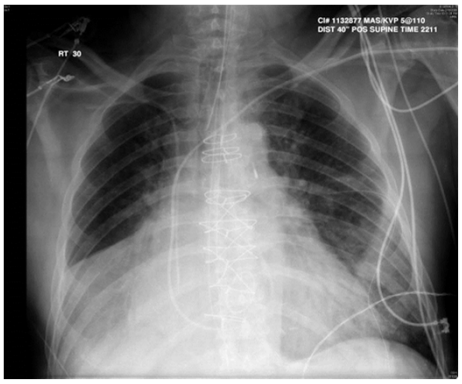

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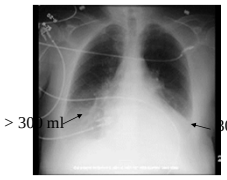
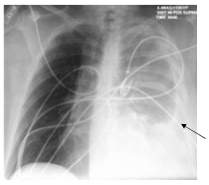
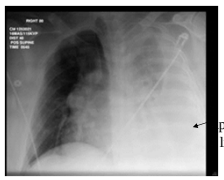
Estimate of volume of pleural fluid

200 – 300 ml to cause costophrenic angle blunting







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Atelectasis

- Collapsed or airless state of the alveoli (no oxygen in alveoli)
- Will appear white on the CXR
- Causes densities (white areas) of the lobes but usually not symmetrical changes in each lung field.
- To confirm atelectasis in lower lobe, a lateral CXR may be necessary

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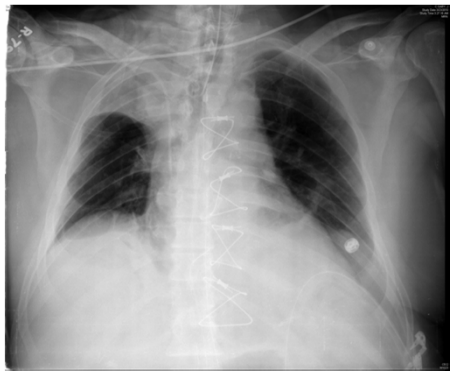

Atelectasis Right Upper Lobe

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Atelectasis

- Causes:
  - Right mainstem intubation with ET tube
  - Secretions or mucous plugs
  - Hypoventilation of alveoli
- Treatment: Reexpand the alveoli
  - Ascertain proper ET tube placement
  - CPAP/BIPAP
  - Incentive spirometry
  - Bronchoscopy

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ARDS
Acute Respiratory Distress Syndrome

- Acute alveolar insult causing pulmonary inflammation and small vessel injury
- Diffuse bilateral patchy infiltrates
- White infiltrates on CXR
- "Blizzard snowstorm"
- "Bilateral whiteout"

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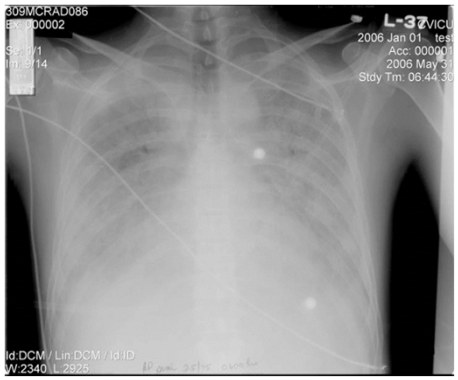

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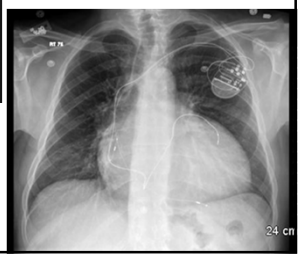
- Cardiomyopathy --- will see the pulmonary hiatus (vasculature)



- Pericardial Effusion
- Water bottle
- (Above)

Cardiac
Tamponade

- Fluid around the heart
- Appears white on the CXR
- Mediastinum gets wider and squares off
- Compare to older CXRs
- Causes
  - Chest trauma
  - Bleeding Post op Cardiac surgery

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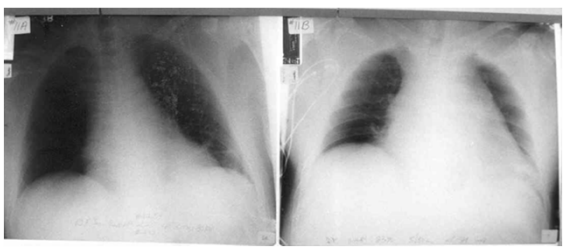

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As Easy As Black

Clinical Findings that show up Black

Pneumothorax

- Air in the pleural space that inhibits complete lung expansion
- A thin, white line represents the displaced visceral pleura
- Small pneumothorax
  - Veil like line evident below the thoracic cage beyond which there are no lung markings.
- Large pneumothorax
  - Black area over entire lung field with no lung markings evident
- ICS may be farther apart on the side with pneumothorax

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Pneumothorax

- Causes:
  - Anything that causes a tear in the lung: line insertion, rib fracture
- Treatment:
  - Chest tube insertion if greater than 10 – 15 %
  - If tension pneumothorax ---- it is a medical **EMERGENCY** and needs **immediate** needle decompression

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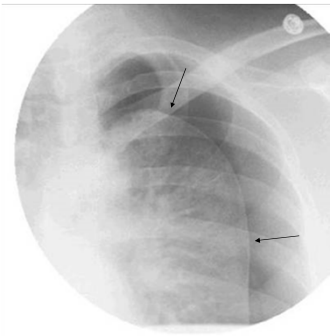
- Left Pneumo under fluro



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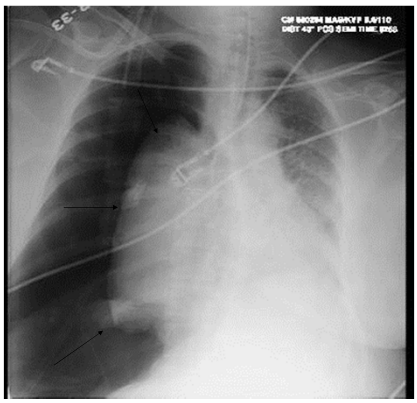

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Power Point Handout available at
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