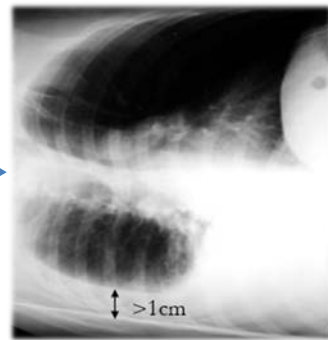
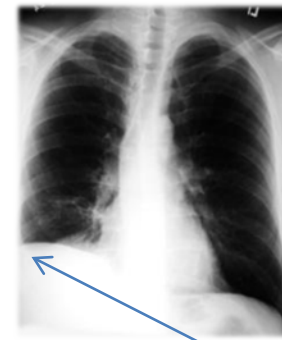


Pleural Effusions

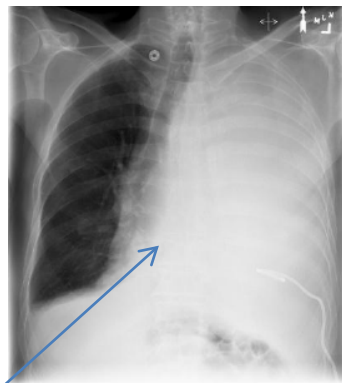
→ **PE**: dull to percussion, ↓ breath sounds and ↓ tactile fremitus over effusion; egophony + ↑ fremitus above level of effusion

→ **CXR**: blunted costophrenic angles, white opacity w/ meniscus, contralateral mediastinal/tracheal shift (if large)

→ If costophrenic angle blunting in lateral decubitus position >1cm → **diagnostic thoracentesis**



Costophrenic angle blunting of unknown size; do lateral decubitus CXR; pt needs thoracentesis if >1cm!



Meniscus at air-fluid level

Contralateral tracheal + mediastinal shift (large effusion)

Exudative effusion

High [Protein]
(Leaky membranes in capillaries around pleura)

Analyze fluid via **Light's Criteria**:

1. Pleural fluid [protein] / serum [protein] > 0.5
2. Pleural fluid [LDH] / serum [LDH] > 0.6
3. [LDH] > 2/3 upper limit of normal serum [LDH] (100-235 U/L)

Transudative Effusion

Low [protein]
(NO Light's Criteria are met)

→ Effusion is exudative if ANY one Light's criteria are met. But still, 25% of exudative effusions are undiagnosed.

⊗

Pulmonary

Hemothorax

Neoplastic

(Ask: smoking + asbestos Hx. Order: thoracoscopy)
→ Primary (mesothelioma)
→ Metastatic lung cancer

Inflammatory

(Ask: joint pain? Rashes? Mouth ulcers? Alopecia?)
Order: ANA
→ Connective tissue dx (RA, SLE)

Pulmonary Embolus

Chylothorax
→ Disruption of thoracic duct
→ Lymphoma

Sub-diaphragmatic:

→ Esophageal rupture
→ Pancreatitis (high serum amylase)
→ Sub-diaphragmatic abscess
→ Benign ovarian tumor

CHF

(high hydrostatic pressure in pulmonary vessels → JVD + pedal edema)
→ Systolic dysfunction
→ Diastolic dysfunction
→ Valvular disease

Hypoproteinemia/Hypoalbuminemia

(↓ plasma oncotic pressure)
→ Nephrotic syndroms
→ Liver cirrhosis (↓ protein synthesis in liver)

Entry of low protein fluid into pleural space from outside source

→ Abdominal fluid/ascites from liver cirrhosis
→ urine
→ CSF
→ IV fluids

Infectious

(Hx: age (extremes)? Diabetic? Substance abuse? Aspiration risk + Poor dentition?)
Order: Gram stain, C&S, AFB of fluid
→ Parapneumonic effusion (PE: simple, complex, empyema)
→ TB effusions

1. Start Abx!
2. Diagnostic thoracentesis!

Frank pus (empyema):

→ drain + abx (at least 6 wks) until resolution

No pus:

→ measure pH, do gram stain + culture

- stain/culture, pH > 7.2:
Simple PE; follow clinically
+ stain/culture, pH < 7.2:
Complex PE → Drain!!!

Investigate:

- **Diagnostic thoracentesis** (pH, glucose, cytology, WBCs, cultures/gram stains, triglycerides, Hct, amylase)
- **Blind needle biopsy** (only 44% sensitive!)
- **Thoroscopy** (90% sensitive for TB + cancer)
- **Additional tests** for specific clinical contexts (Liver Function Tests for transudative effusion, etc)