### Pleural Effusions

**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**

#### Exudative effusion
- **High [Protein]**
  - (Leaky membranes in capillaries around pleura)
  - Entry of low protein fluid into pleural space from outside source
  - → Abdominal fluid/ascites from liver cirrhosis
  - → urine
  - → CSF
  - → IV fluids

#### Transudative effusion
- **Low [protein]**
  - (NO Light’s Criteria are met)

#### Transudative
- Entry of low protein fluid into pleural space from outside source
  - Abdominal fluid/ascites from liver cirrhosis
  - → urine
  - → CSF
  - → IV fluids

#### 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)

#### Meniscus at air-fluid level
- **Contralateral tracheal + mediastinal shift (large effusion)**

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

#### Pulmonary

- **Pulmonary embolus**
- **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 syndromes
- Liver cirrhosis (↓ protein synthesis in liver)

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

#### 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

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

#### Frank pus (empyema):
- (↓ pH,↓ WBCs,↓ gram stain + culture)
  - - stain/culture, pH > 7.2: Simple PE; follow clinically
  - + stain/culture, pH < 7.2: Complex PE → Drain!!!