Cheatography

ACNP Pulmonary Pleural Cheat Sheet

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Pleural Effusion

Pathophysiology	Caused by **increased drainage of fluid into the pleural space**, increased production of fluid by cells in the pleural space, or decreased doing of fluid from the pleural space.
Causes	• **CHF is most common cause**. • Bacterial pneumonia, malignancies (36% of lung, 25% of breast, 10% of lymphoma), PE, viral diseases, and cirrhosis with ascites.
Symptoms	Often asymptomatic. **Dyspnea on exertion, peripheral edema, orthopnea, and PND**.
Signs	**Dullness to percussion**, decreased breath sounds, and decreased tactile fremitus.
Transudative Effusions	Pathophysiology is due to either **elevated capillary pressure in the visceral or parenteral pleura** (as in CHF), or **decreased plasma oncotic pressure** (hypoalbuminemia). • Causes include CHF, cirrhosis, PE, nephrotic syndrome, peritoneal dialysis, **hypoalbuminemia**, and atelectasis. • pH is normally 7.4-7.55.

Pleural Effusion (cont)

Exudative Effusions	Caused by **increased permeability** of pleural surfaces or **decreased lymphatic flow** from the pleural surface because of damage to pleural membranes or vasculature. • Causes are **bacterial pneumonia**, TB, malignancy, **metastatic disease**, PE, viral infection, and collagen vascular diseases. • Exudates must have >1 of the following. **Protein pleural/protein serum >0.5. LDH pleural/LDH serum >0.6. LDH> 2/3 upper limit of normal serum LDH**. • pH is 7.3-7.45. If <7.3, empyema, tumor, fibrosis.

Empyema

Causes	• Exudative pleural effusions left untreated can lead to empyema. • Most cases occur as a **complication of bacterial pneumonia**, but other foci of infection can spread to the pleural space (mediastinhtis, abscess).
Diagnosis	CXR and CT
Treatment	• Aggressive drainage of the pleura via thoracentesis and antibiotic therapy. • Very difficult to eradicate and recurrence is common. • If severe and persistent, rib resection and open drainage may be necessary.

Tests + Treatment

CXR	• Look for **blunting of the costophrenic angle**. •250mL must accumulate before an effusion can be detected. • Lateral decubitus films are more reliable for detecting small pleural effusions. • Can also determine if the fluid is free or located.
CT Scan	More reliable than CXR.
Treatment	• For **transudative**, diuretics, sodium restriction, and **therapeutic thoracentesis** if massive and causing dyspnea. • For **exudative**, treat underlying disease. • For **parapneumonic effusions**, antibiotics alone if uncomplicated. • **Complicated effusions or empyema require chest tube drainage**, intracellular injection of thrombolytic agents (streptokinase or urokinase) to accelerate drainage, and/or surgical lysis of adhesions.

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Tests + Treatment (cont)

Thoracentesis	• Useful if etiology is not obvious. • Provides a diagnosis in 75% of patients. • Drainage provides relief of symptoms for large effusions. • Pneumothorax is a complication in 10-15% of cases, but requires treatment with a chest tube in <5%. • Do not perform if effusion is <10mm thick on lateral decubitus CXR. • Send fluid for CBC, protein, LDH, pH, glucose, gram stain, and cytology, Chemistry, cytology, cell count, and culture.
Pleural Fluid Tests	• CBC, glucose, pH, amylase, TGs, microbiology, and cytology. • **Elevated pleural amylase** is associated with esophageal rupture, pancreatitis, and malignancy. • Milky, opalescent fluid is a chylothorax. • Frankly purulent fluid is empyema. • Bloody effusion is associated with malignancy. • Exudative effusions that are primarily lymphocytic are associated with TB. • pH<7.2 is associated with parapneumonic effusion or empyema. • If glucose<60, rule out RA. Can also be low in other causes.

Pneumothorax

Traumatic	• Often iatrogenic. • Always obtain a **CXR after transthoracic needle aspiration, thoracentesis, and central line** placement.

Pneumothorax (cont)

Spontaneous Primary	• Occur without underlying lung disease. • Caused by **spontaneous rupture of subpleural blebs** (air-filled sacs on the lung) at the apex of lungs. • Escape of air from the lung into the pleural space causes lung to collapse. • More common in tall, lean young men. • Patients have sufficient pulmonary reserve, so severe respiratory distress does not occur in most cases. • Recurrence rate is 50% in 2 years.
Spontaneous Secondary	• Occurs as a complication of underlying lung disease, most commonly **COPD**. • Smoking leads to chronic airway inflammation and formation of respiratory bronchiolitis. • The chronic destruction of alveoli leads to large alveolar blebs in the upper lobes, which can rupture and leak air into the pleural space. • Other conditions include asthma, ILD, neoplasms, CF, and TB. **More life-threatening because of lack of pulmonary reserve**.
Symptoms	**Ipsilateral chest pain**, usually sudden in onset. Dyspnea, cough.

Pneumothorax (cont)

Signs	Decreased breath sounds, hyperresonance, decreased/absent tactile fremitus, **mediastinal shift toward the side** of the pneumothorax.
CXR	Shows visceral pleural line.
Treatment	• If small and asymptomatic, observation as it should resolve spontaneously in ~20days. • Small chest tube with one-way valve may benefit some patients. • If pneumothorax is larger or symptomatic, supplemental oxygen and chest tube insertion. • If secondary, chest tube drainage is always indicated.

Tension Pneumothorax

Pathophysiology	• Accumulation of **air within the pleural space** such that tissues surrounding the opening into the pleural cavity act as valves, allowing air to enter but not to escape. • The accumulation of **air under positive pressure in the pleural space collapses the ipsilateral lung** and shifts the mediastinum away form the side of the pneumothorax.
Causes	Trauma, CPR, mechanical ventilation with associated barotrauma.

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Tension Pneumothorax (cont)	
Signs	Hypotension (**cardiac filling is impaired due to compression of the great veins**), distended neck veins, **shift of trachea away from pneumothorax**, decreased breath sounds, hyper resonance to percussion.
Treatment	Do not order CXR. Medical emergency. The patient is likely to die of hemodynamic compromise. **Immediately decompress with large-bore needle** or chest tube.

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