



**Al-Mustamsiriyah University
College of Medicine
Small Group Learning Committee**

Scenario 3: Department of Physiology

Diagnosis: Pulmonary structure and Lung capacities - acute respiratory distress syndrome (ARDS).

- A 34-year-old woman with diabetes presents to the emergency department with complaints of **fever, chills, back pain, dizziness, and shortness of breath**. She reports a new-onset nonproductive **cough** and denies having chest pain. She reports no sick contacts.
- On examination, she is **ill-appearing, febrile, hypotensive, and tachycardic**. She has marked right costovertebral (flank) tenderness. Her lung examination demonstrates coarse rales and rhonchi throughout both lung fields. Her heart rate is tachycardic, but with a regular rhythm. Her **oxygen saturation on room air is very low** at 80% (normal >94%).
- Urinalysis reveals numerous bacteria and leukocytes, consistent with a urinary tract infection. She is diagnosed with pyelonephritis and septic shock and has evidence of **ARDS** with bilateral pulmonary infiltrates on chest x-ray. The doctor explains to the patient that pulmonary injury has led to leaky pulmonary capillaries.

The Objectives:

1. Diagram lung volumes and capacities.
2. Describe the anatomy of the pulmonary tree.
3. Discuss pulmonary blood flow and regulation.
4. Define and summarize the pathophysiology of ARDS.
5. Describe the role of Neutrophils in Acute Lung Injury (ALI)/ARDS.
6. Brief the Molecular Mechanisms of the Pulmonary Barrier Injury in ALI/ARDS

References:

- Guyton & Hall Textbook of Medical Physiology
- Davidson's Principles and Practice of Medicine