Pulmonary Pathophysiology

Course Directors:
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Purpose of the Course

To provide you with an understanding of the mechanisms responsible for major pathophysiologic abnormalities arising from respiratory disease.
Course Objectives

• To understand the important categories and causes of lung disease in humans

• To understand functional abnormalities in disease states
  – Mechanics
  – Gas exchange
  – Ventilation
  – Vascular changes
Course Objectives - 2

- To understand the role of diagnostic testing in pulmonary disease
- To understand treatment approaches to patients with lung diseases
Course Outline

• 14 Lectures
• 6 Small Group Sessions
• 2 Pathology Lab Sessions
• 1 Pathology Review Session
• Textbook
  – Required reading
Course Structure

• Review and overview
• Airway diseases
• Parenchymal diseases
• Neoplasms
• Respiratory failure
• Pulmonary vascular disease
Instructors’ Responsibilities

• Clear communication
  – Visual
  – Oral
  – Logical

• Complete and timely answers to questions

• Consistency of required material
Students’ Responsibilities

• Presence at all scheduled sessions

• Completion of required reading prior to each session

• Active participation in small groups and laboratory sessions
Paradigm
Causes of Disease

Structural Change
- Physical examination
- Radiographic examination
  - Chest x-ray
  - Chest CT
- Histological examination
  - Transthoracic needle biopsy
  - Transbronchial biopsy
  - Surgical biopsies
Structural Change 

Functional Change 

Respiratory System Mechanics 

Gas Exchange 

Ventilation 

Vascular Changes
### Respiratory System Mechanics

- Airway resistance
- Lung compliance
- Chest wall compliance

### Gas Exchange

- V/Q mismatch
- Right-to-left shunt
- Diffusion

### Ventilation

- Control of breathing
- Alveolar ventilation
- Dead space ventilation

### Pathophysiology

- Dead space ventilation

### Diagnosis

- Physical exam
- PFTs
- Ventilator (!)

### Treatment

- Diuresis
- Antibiotics
- Corticosteroids
- Bronchodilators
- Radiotherapy
- Transplantation

### Vascular Changes

- Vascular obstruction
- Vasculopathy

### Exchange

- Right-to-left shunt
- Diffusion

### Vascular Changes

- V/Q scanning
- Angiography
- Right heart cath.
- Echocardiography

### Treatment

- Ventilation
  - Invasive
  - Non-invasive
- Anticoagulation
- Vasodilators
- Oxygen
- PEEP
Respiratory System Mechanics

Gas Exchange

Ventilation

Vascular Changes

Causes of Disease

Structural Change

Functional Change

• Physical examination
• Radiographic examination
• Histological examination
Contact information

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