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 which may be encountered in cardiorespiratory 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 learn the significance of the signs and symptoms of pulmonary disease

• To understand the role of diagnostic testing in pulmonary disease

• To understand treatment approaches to patients with lung diseases
Course Outline

• 13 Lectures
• 6 Small Group Sessions
• 2 Pathology Lab Sessions
• 1 Pathology Review Session
• Textbook
  – Required reading
• Syllabus

Course Outline  - 2

• Review and overview of pulmonary pathophysiology
• Airway disease
• Parenchymal disease
• Neoplasms
• Infections
• Respiratory failure
• Pulmonary vascular disease
New for 2009

• More review this week
• Team-Based Learning session
• Revised lectures
  – COPD
  – ILD (DPLD)
  – 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

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Structural Change → Functional Change

- **Respiratory System Mechanics**
- **Gas Exchange**
- **Ventilation**
- **Vascular Changes**
### Respiratory System Mechanics

- Airway resistance
- Lung compliance
- Chest wall compliance

### Pathophysiology

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

### Gas Exchange

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

### Ventilation

- Control of breathing
- Alveolar ventilation
- Dead space ventilation

### Vascular Changes

- Vascular obstruction
- Vasculopathy

### Causes of Disease

- Physical examination
- Radiographic examination
- Histological examination

### Structural Change

### Functional Change

- Arterial blood gas
- Pulse oximetry
- Diffusion capacity
- Shunt studies

### Diagnosis

- Physical exam
- PFTs
- Ventilator (!)

### Treatment

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

- Oxygen
- PEEP

- Ventilation - Invasive
  - Non-invasive

- Anticoagulation
- Vasodilators
Contact information

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