

Pulmonary Pathophysiology

Course Directors:
Daniel Brodie, MD
David Lederer, MD

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
 - John West “Pulmonary Pathophysiology” 7th edition (2008)
 - **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

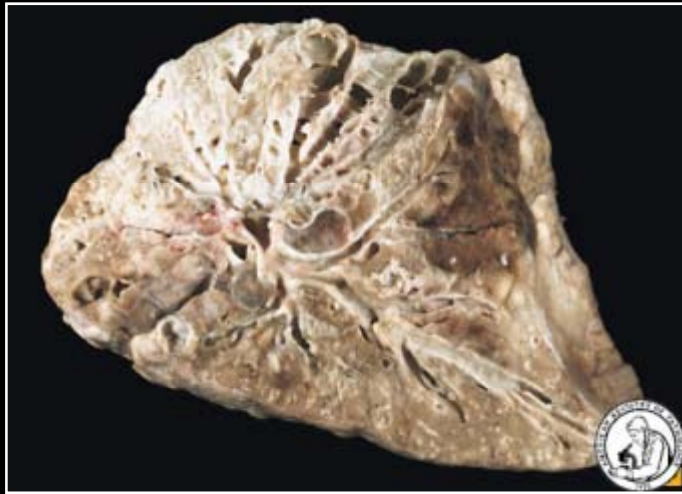
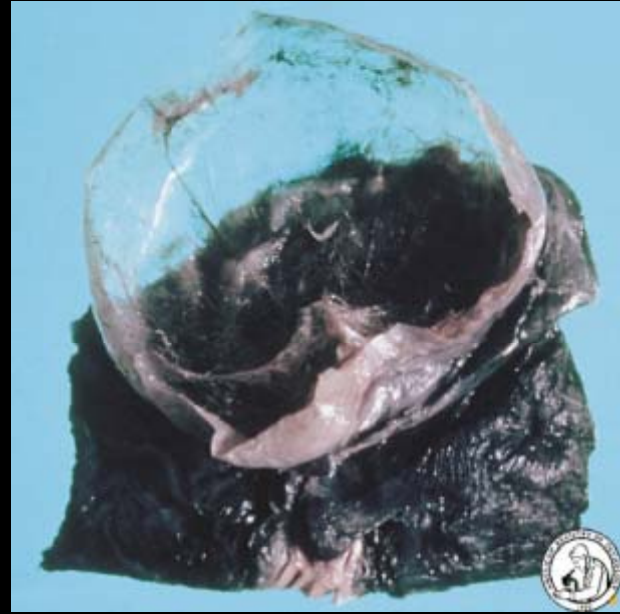
- Presence at all scheduled sessions
- Completion of required reading prior to each session
- Active participation in small groups and laboratory sessions

Paradigm


Causes
of
Disease



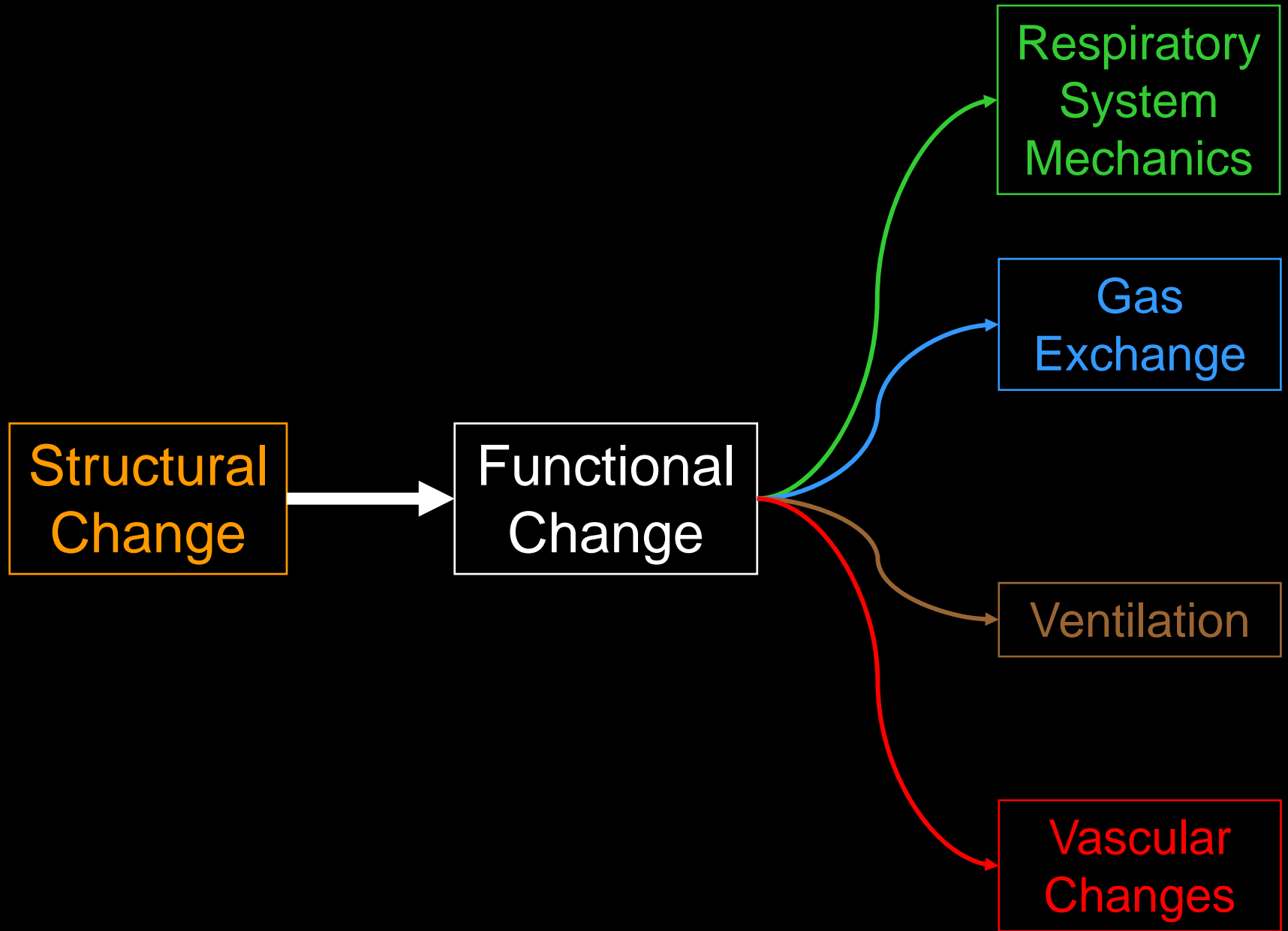
Structural
Change



**Structural
Change**



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



Pathophysiology

Diagnosis

Treatment

Respiratory System Mechanics

- Airway resistance
- Lung compliance
- Chest wall compliance

- Physical exam
- PFTs
- Ventilator (!)

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

Gas Exchange

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

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

- Oxygen
- PEEP

Ventilation

- Control of breathing
- Alveolar ventilation
- Dead space ventilation

- Arterial blood gas
- Polysomnography

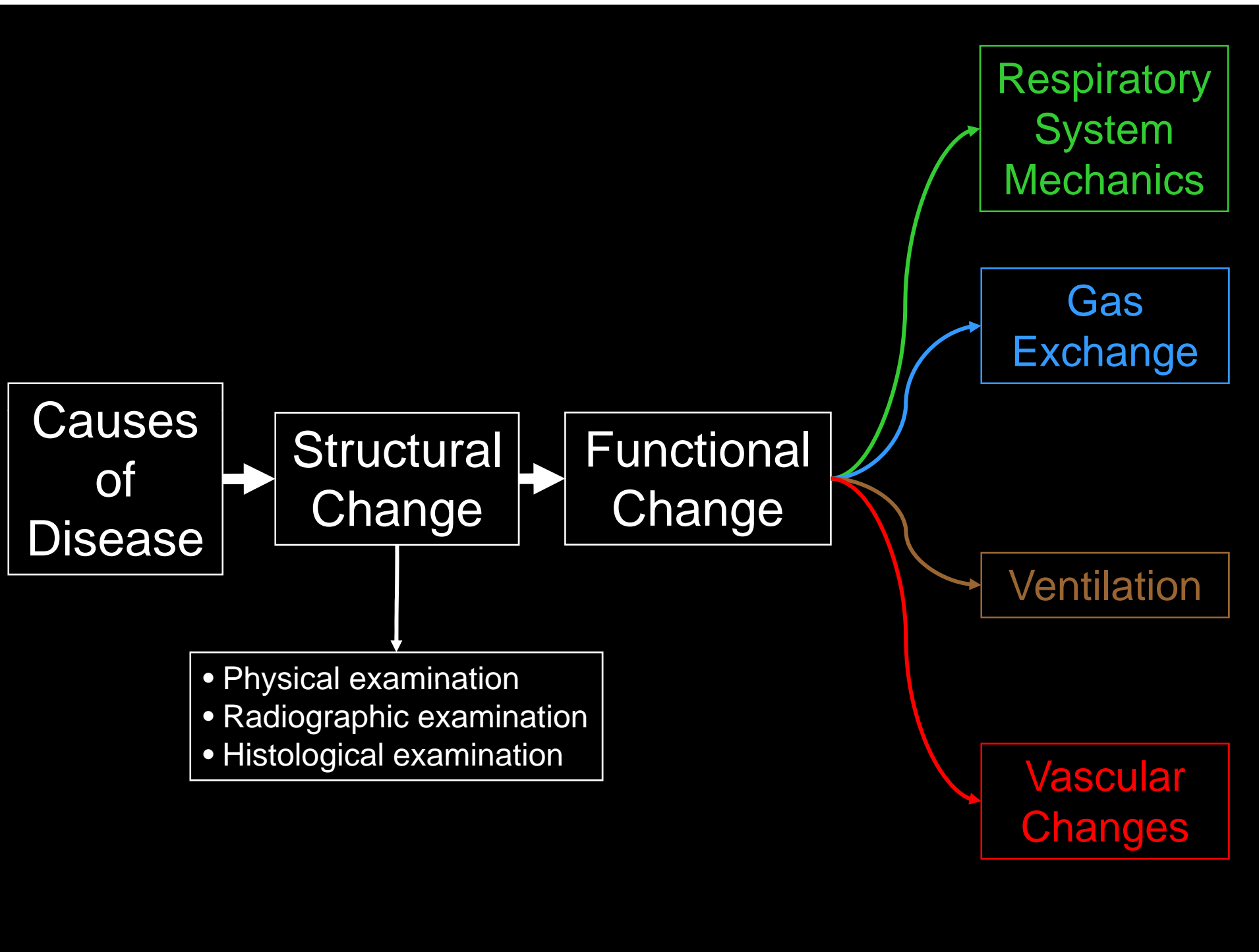
- Ventilation
 - Invasive
 - Non-invasive

Vascular Changes

- Vascular obstruction
- Vasculopathy

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

- Anticoagulation
- Vasodilators



Contact information

- David Lederer
 - E-mail: DL427@columbia.edu
- Daniel Brodie
 - E-mail: HDB5@columbia.edu