Mount Sinai Pulmonary Medicine

Core Curriculum Objectives and Relevant Literature

Guide for Students, Residents, and Fellows During Their Pulmonary Rotations

A. Asthma:
   1. Objectives:
      a. To understand the epidemiology of asthma and the contributions of genetic predisposition and environmental factors
      b. To learn the pathology and pathophysiology of asthma and importance of inflammatory mechanisms of this disease
      c. To appreciate the risk factors for asthma and the causes of exacerbation of symptoms
      d. To be able to objectively and accurately diagnose this disease
      e. To learn the strategies of treating asthma based on the NIH guidelines
   2. Relevant Literature:
      c. Clinical Practice: Mild Asthma. NEJM 2001; 345(17):1257-1262
      g. Long-acting β2-Agonist Monotherapy vs Continued therapy with Inhaled Corticosteroids in Patients with Persistent asthma: a Randomized Trial. JAMA 2001; 285:2583–2593

Authors: 5-15-05
S. Lorin, MD
D. Fischler, MD
k. Use of Exhaled Nitric Oxide Measurements to Guide Treatment in Chronic Asthma. *NEJM* 2005; Volume 352:2163-2173


**B. Occupational Asthma:**

1. **Objectives:**
   a. To provide a clinical definition of occupational asthma
   b. To outline the various mechanisms by which asthma develops from exposures encountered in the work setting
   c. To highlight specific examples of occupational asthma
   d. To discuss the evaluation of a patient with possible occupational asthma
   e. To review the management of a patient with confirmed occupational

2. **Relevant Literature:**

**C. Lung Cancer:**

1. **Objectives:**
   a. To outline the various causes of lung cancer, and the types of clinical and radiologic presentations peculiar to each cell type
   b. To review the paraneoplastic syndromes associated with lung cancer
   c. To place in perspective the appropriate use of laboratory studies, imaging techniques, and diagnostic approaches to patients with lung cancer
   d. To review the results of various treatment modalities for both small-cell and non-small cell lung cancers

2. **Relevant Literature:**
   a. Diagnosis and Management of Lung Cancer: ACCP Evidence Based Guidelines *Chest* 2003; 123(1): 1S-337S → an entire volume dedicated to this topic
   f. Lung Cancer: Where are we today? *Am J Respir Crit Care Med* 2002; 166:1166-1196
   i. Regional Lymph Node Classification for Lung Cancer Staging. *Chest* 1997; 111:1718-1723

D. **Chronic Obstructive Pulmonary Disease:**

1. **Objectives:**
   a. To review the current definition of COPD and describe how this definition may be inadequate based on our current understanding of the disease
   b. To explore the impact of COPD including morbidity and mortality
   c. To review the risk factors for COPD
   d. To explore the natural history of COPD from its earlier asymptomatic stages to the late stages associated with morbidity and mortality
   e. To explore the current understanding of the pathophysiology of COPD through an understanding of the pathologic changes that occur
   f. To review the current state of therapy for COPD including preventative measures such as smoking cessation

2. **Relevant Literature:**
   d. Antibiotics are Associated with Lower Relapse Rates in Outpatients with Acute Exacerbation of COPD. *Chest* 2000; 117:1345–1352
   e. Multicentre randomized placebo-controlled trial of inhaled fluticasone in patients with COPD. *Lancet* 1998; 351:773-780
   i. Clinical Practice: Treatment of Tobacco Use and Dependence. *NEJM* 2002; 346(7):506-512
   j. ACCP/AACVPR Pulmonary Rehabilitation Guidelines Panel: Pulmonary Rehabilitation. *Chest* 1997; 112:1363-1396
   l. ATS/ERS Statement: Standards for the diagnosis and management of individuals with Alpha1 Antitrypsin Deficiency. *Am J Respir Crit Care Med* 2003; 168:818-900
E. Pulmonary Vascular Diseases:

1. Objectives:
   a. To review the management of Venous Thromboembolic (VTE) disease
   b. To describe the risk factors and epidemiology of VTE
   c. To provide alternative approaches to the diagnosis of VTE
   d. To describe the causes of secondary pulmonary hypertension
   e. To review the steps in the diagnosis of primary pulmonary hypertension
   f. To review the therapy for primary and secondary pulmonary hypertension
   g. To review the diagnosis and management of hereditary hemorrhagic telangiectasia and pulmonary arteriovenous malformations

2. Relevant Literature:
   d. Medical Progress: Pulmonary Embolism. NEJM 1998; 339(2):93-104
   g. Thrombolytic Therapy in Patients with Submassive Pulmonary Embolism. NEJM 2003; 348:357-359
   h. Chronic Thromboembolic Pulmonary Hypertension. NEJM 2001; 345(20):1465-1472
   i. Primary Pulmonary Hypertension. NEJM 1997; 336:111-117
   l. Reduction in Pulmonary Vascular Resistance with Long-Term Epoprostenol Therapy in Primary Pulmonary Hypertension. NEJM 1998; 338:273-277
   m. Bosentan Therapy for Pulmonary Arterial Hypertension. NEJM 2002; 346(12):896-903
   q. Care of Patients Receiving Long-Term Anticoagulant Therapy. NEJM 2003; 349(7):675-682

F. Bronchiectasis/Cystic Fibrosis

1. Objectives:
   a. To address the causes of bronchiectasis
   b. To discuss the therapeutic options for the treatment of bronchiectasis
   c. To review the genetic aspects of cystic fibrosis
   d. To consider the newer therapeutic approaches to the treatment of cystic fibrosis

2. Relevant Literature:
   c. Diagnosis of Cystic Fibrosis. *NEJM* 1997; 336:487-491
   d. Management of Pulmonary Disease in Patients with Cystic Fibrosis. *NEJM* 1996; 335:179-188
   e. Effects of aerosolized recombinant human DNase on exacerbations of respiratory symptoms and on pulmonary function in patients with Cystic Fibrosis. *NEJM* 1994; 331:637-642

G. Hypersensitivity Pneumonitis:

1. Objectives:
   a. To discuss the features of dusts and particulate matter that dictate possible clinical manifestations
   b. To identify the most common causes and the usual clinical presentations of hypersensitivity pneumonitis
   c. To describe those clinical situations that are similar to hypersensitivity pneumonitis but are clinically distinct entities
   d. To review the most likely pathogenetic mechanisms and the continuing gaps in our understanding
   e. To outline an approach to the diagnosis of the disease

2. Relevant Literature:
c. The Diagnosis of Hypersensitivity Pneumonitis. *Chest* 1997; 111:534-536


**H. Pulmonary Infections:**

1. **Objectives:**
   
a. To define the epidemiology of community-acquired pneumonia (CAP) and risk factors for mortality

   b. Discuss the common etiologic pathogens of CAP

   c. Review current treatment strategies for CAP

   d. Discuss the clinical relevance of atypical pathogens and penicillin-resistant pneumococci

   e. Review the benefits of pneumococcal and influenza vaccine

   f. To discuss the diagnosis and treatment of influenza

   g. To discuss the diagnosis and treatment of Nocardia infection in the lung

   h. To discuss the diagnosis and treatment of Actinomycosis of the lung

   i. To review tick-borne pulmonary diseases

   j. To describe the epidemiology of the endemic mycosis

   k. To describe the clinical syndrome of endemic mycosis

   l. To familiarize physicians with the various diagnostic tests pertaining to pulmonary fungal infections

   m. To detail different therapeutic strategies for fungal diseases

2. **Relevant Literature:**

   a. ATS guidelines for the Management of Adults with Community-acquired Pneumonia. *Am J Respir Crit Care Med* 2001; 163:1730-1754


   i. Pulmonary infection with Nocardia species. *Eur Respir J* 1997; 10(7):1542-1546


I. **Eosinophilic Lung Diseases:**

1. **Objectives:**
   a. To highlight the heterogeneous nature of these disorders and suggest a usable classification system
   b. To discuss important aspects of the eosinophil
   c. To review diseases that involve the eosinophil and the airways
   d. To discuss known parenchymal lung disorders that are associated with peripheral and/or tissue eosinophilia
   e. To highlight the idiopathic eosinophilic lung diseases

2. **Relevant Literature:**
   g. Tropical Pulmonary Eosinophilia. *Chest* 1998; 113:1673-1679

J. **Pneumoconioses:**

1. **Objectives:**
   a. To review the pathology, pathophysiology and radiographic similarities and differences between coal worker’s pneumoconiosis and silicosis
   b. To explain asbestos-induced lung and pleural diseases, with emphasis on the functional abnormalities and the ILO system for classifying the pneumoconiosis
   c. To discuss malignancies related to asbestos
   d. To review briefly a variety of other nonorganic pneumoconioses

2. **Relevant Literature:**
   e. Chronic Beryllium Disease: uncommon disease, less common diagnosis. *Environmental Health Perspectives* 1998;106:765-767

K. **Pleural Diseases:**

1. **Objectives:**
   a. To understand the pathogenesis of pleural fluid formation in health and disease
   b. To appreciate the clinical presentation, radiographic features and course associated with common causes of pleural effusions
c. To appreciate the value of pleural fluid analysis in determining the cause of a pleural effusion
d. To understand the management of patients with pleural effusions, especially malignant and parapneumonic effusions
e. To understand the pathogenesis, causes, clinical features and management of patients with spontaneous pneumothorax
f. To understand the pathophysiology, diagnosis and management of patients with trapped lung
g. To understand the pathophysiology, diagnosis and management of patients with yellow nail syndrome

2. Relevant Literature:
   d. Resolution of Pleural Effusions. *Chest* 2001; 119:1547-1562
   e. Medical and Surgical Treatment of Parapneumonic Effusions: an Evidence Based Guideline. *Chest* 2000; 118:1158-1171

L. Mediastinum

1. Objectives:
   a. Discuss compartments of the mediastinum
   b. Discuss diagnostic evaluation of mediastinal lesions
   c. Describe common mediastinal disorders
   d. To understand the pathogenesis, clinical presentation, diagnosis and management of patients with fibrosing mediastinitis and mediastinal lipomatosis

2. Relevant Literature:
   b. Primary Mediastinal Tumors Part 2. *Chest* 1997; 112:1344-1357
M. Other Intrathoracic Tumors

1. Objectives:
   a. Discuss the tumors that can affect the mediastinum
   b. Describe carcinoid, cylindroma, hamartoma, etc.
   c. Discuss metastatic malignancy in the thorax
   d. Discuss tracheobronchial amyloidosis

2. Relevant Literature:
   g. Lymphoid Interstitial Pneumonia. *Chest* 2002; 122:2150-2164
   j. Primary Pulmonary Plasmacytoma. *Chest* 2001; 120:1405-1407
   k. A Case of Pulmonary Artery Sarcoma. *NEJM* 2000; 343(7):493-500

N. Parenchymal Lung Disease (non IIP):

1. Objectives:
   a. To discuss several uncommon diffuse lung diseases
   b. Describe the pulmonary manifestations of these uncommon pulmonary disorders
   c. Discuss treatment options for these uncommon entities
   d. Discuss the pathogenesis, clinical features and treatment of pulmonary disorders that occur in patients with sickle cell hemoglobinopathies
   e. To discuss pulmonary injury caused by radiation therapy of malignancy
   f. To describe the salient epidemiologic, clinical, physiologic and radiographic features of Langerhans cell histiocytosis, lymphangioleiomyomatosis and cryptogenic organizing pneumonia
   g. To compare and contrast the salient features on high-resolution CT scans seen in these disorders
   h. To review the characteristic histopathologic immunohistochemical techniques or markers
   i. To review the differing therapeutic strategies among these disorders

2. Relevant Literature:
   c. Pulmonary Alveolar Microlithiasis. *Semin Respir Crit Care Med* 2002; 23:103-113
   d. Pulmonary Alveolar Microlithiasis (image). *NEJM* 2003; 348(16):1555
O. Pulmonary Vasculitis and Alveolar Hemorrhage Syndromes:

1. Objectives:
   a. Discuss the spectrum of respiratory vasculitides
   b. Describe clinical features of Wegener’s Granulomatosis
   c. Consider other respiratory vasculitides
   d. Review the therapy of respiratory vasculitides
   e. Discuss alveolar hemorrhage syndromes

2. Relevant Literature:
   b. Small vessel vasculitis. NEJM 1997; 337(21):1512-1523

P. Pulmonary Function Testing:

1. Objectives:
   a. To understand the importance of test performance quality; normal range of values
      and clinical context on interpretation of pulmonary function tests
   b. To recognize the distinct role of lung mechanics tests and gas exchange tests in
      the evaluation of pulmonary impairment
   c. To develop a fuller understanding of the significance of the shape and pattern of
      the flow-volume loop and volume-time curves.
   d. To recognize the pulmonary function test result patterns of abnormality found in
      various diseases
   e. To recognize the role of bronchoprovocation testing in excluding the diagnosis of
      asthma

2. Relevant Literature:

Q. Symptoms of Respiratory Disease:

1. Objectives:
   a. To address the symptoms of respiratory disease commonly encountered by the pulmonologist
   b. To review the physiology, pathophysiology, complications, differential diagnosis, pathogenesis, diagnosis and treatment of cough
   c. To review the physiology, pathophysiology, complications, differential diagnosis, pathogenesis, diagnosis and treatment of wheeze
   d. To review the physiology, pathophysiology, complications, differential diagnosis, pathogenesis, diagnosis and treatment of hemoptysis
   e. To review the physiology, pathophysiology, complications, differential diagnosis, pathogenesis, diagnosis and treatment of dyspnea

2. Relevant Literature:
   d. The role of GERD in cough and asthma. *Chest* 1997; 111:1389-1402
   e. Pathophysiology of Dyspnea. *NEJM* 1995; 333(23):1547-1533

R. Tuberculosis and Nontuberculous Mycobacterium:

1. Objectives:
   a. To become familiar with the epidemiology of tuberculosis
   b. To review the pathogenesis and clinical presentation of tuberculosis
   c. To address issues concerning the prevention of tuberculosis, including the diagnosis and treatment of tuberculosis infection
   d. To review issues concerning the diagnosis and treatment of tuberculosis disease
   e. To outline pertinent topics in of Mycobacterium other than tuberculosis
   f. To review the pathogenesis, diagnosis and treatment of HIV patients with tuberculosis

2. Relevant Literature:
e. ATS Guidelines: Diagnosis and Treatment of Disease caused by Nontuberculous Mycobacteria. *Am J Respir Crit Care Med* 1997; 156:S1-S25

**S. Idiopathic Interstitial Pneumonias (IIP) and Sarcoidosis:**

1. **Objectives**
   a. To describe the salient epidemiologic, clinical, physiologic, and radiographic features of idiopathic pulmonary fibrosis, non-specific interstitial pneumonia, desquamative interstitial pneumonia and acute interstitial pneumonia
   b. To discuss the salient features on high-resolution CT scans and their impact on prognosis
   c. To review the characteristic histopathologic features of each of these disorders and the role of transbronchial or surgical lung biopsies
   d. To discuss the clinical role of ancillary studies such as radionuclide scanning or BAL to stage or follow up these disorders
   e. To review therapeutic strategies

2. **Relevant Literature**
   d. Idiopathic Pulmonary Fibrosis. *NEJM* 2001; 345(7):517-525
   e. A Placebo Controlled Trial of Interferon Gamma 1b in Patients with Idiopathic Pulmonary Fibrosis. *NEJM* 2004; 350:125-133
   g. The Elusive Goal of Therapy for Usual Interstitial Pneumonia. *NEJM* 2004; 350:181-183
   j. Sarcoidosis. *NEJM* 1997; 336(17): 1224-1234
T. Lung Transplantation

1. Objectives
   a. To define indications for lung transplantation
   b. To review guidelines for recipient selection for lung transplantation
   c. To describe relative and absolute contraindications to lung transplantation
   d. To describe outcomes following transplantation including survival and physiologic results
   e. To review complications following lung transplantation
   f. To give an overview of the immunosuppressive medications used in lung transplantation

2. Relevant Literature
   d. Bronchiolitis Obliterans after Lung Transplantation. *Am J Respir Crit Care Med* 2002; 166; 440-444

U. Women’s Issues in Pulmonary Medicine

1. Objectives
   a. To review the normal respiratory and cardiovascular physiology of pregnancy
   b. To review the management of asthma in pregnancy
   c. To review the management of venous thromboembolism in pregnancy
   d. To review the management of tuberculosis in pregnancy
   e. To review the causes and management of acute respiratory failure in pregnancy
   f. To discuss the statistics regarding smoking and the epidemiology of lung cancer in women

2. Relevant Literature
V. Drug-Induced Lung Diseases

1. Objectives
   a. To appreciate the diverse clinical syndromes of drug-induced pulmonary diseases
   b. To understand the general approach to the patient with suspected drug toxicity
   c. To review the common abnormalities associated with specific chemotherapeutic agents
   d. To comprehend the typical manifestations of pulmonary toxicity due to non-chemotherapeutic agents

2. Relevant Literature
   a. Bleomycin Induced Pneumonitis. *Chest* 2001; 120:617-624
   g. Heroin-related Noncardiogenic Pulmonary Edema. *Chest* 2001; 120:1628-1632

U. Pulmonary Manifestations of Systemic Diseases

1. Objectives
   a. To review the pulmonary manifestations of SLE
   b. To review the pulmonary manifestations of RA
   c. To review the pulmonary manifestations of Scleroderma
   d. To review the pulmonary manifestations of Sjogren’s Syndrome
   e. To review the pulmonary manifestations of Ankylosing Spondylitis and Relapsing Polychondritis
   f. To review the pulmonary manifestations of Polymyositis and Dermatomyositis
   g. To review the pulmonary manifestations of Amyloidosis
   h. To review the pulmonary complications of HIV infection
   i. To review the pulmonary complications of Bone Marrow Transplantation

2. Relevant Literature
g. Interstitial Lung Disease, a Common Manifestation of Newly Diagnosed Polymyositis and Dermatomyositis. *Ann Rheum Dis* 2004; 63(3):297-301


V. **Preoperative and Perioperative Management**

1. **Objectives**
   a. To review the preoperative evaluation of patients undergoing lung resection as well as patients undergoing non-pulmonary surgery
   b. To apply physiologic parameters preoperatively to predict postoperative pulmonary complications following thoracic resection or cardiac surgery
   c. To explain the pathophysiology of hypoxemia in patients following cardiac surgery
   d. To recognize and treat the most common causes of post cardiac surgery respiratory failure

2. **Relevant Literature**
   e. The Postpneumonectomy State. *Chest* 1998; 114:1158-1184

W. **Radiology:**

X. **High-Altitude/Diving/Near Drowning**

1. **Objectives**
   a. To explain the pathophysiology of diving-related and high altitude pulmonary related complications by using the ideal gas law and the alveolar gas equation
   b. To contrast the differences in thoracic volume and pressure that occur in breath-hold diving, scuba diving, and descent in a submarine
   c. To predict which patients with pulmonary disease will require supplemental oxygen when flying in commercial aircraft
d. To discuss preventative methods to avoid acute mountain sickness and high altitude pulmonary edema.
e. To recognize that noncardiogenic edema occurs in freshwater and saltwater near-drowning victims and that most immersion accidents are preventable

2. **Relevant Literature**
   e. Pathogenesis of High Altitude Pulmonary Edema. *JAMA* 2002; 287:2228-2235
   g. Drowning. *NEJM* 1993; 328:253-256