

Pulmonary Educational Goals & Objectives

Pulmonary diseases commonly affect both outpatients and hospitalized patients. The Pulmonary Medicine rotation will provide the resident with an opportunity to manage a number of common pulmonary symptoms and diseases, be exposed to more rare pulmonary conditions, and identify pulmonary manifestations of systemic disease. This rotation involves some inpatient consultation as well as an emphasis on the diagnosis, evaluation, and management of chronic disease in the outpatient setting. The goal is to familiarize residents with basic mechanisms of disease, clinical manifestations, and evidence based guidelines for care. Depth of exposure should be such that residents can develop competence in the maintenance of pulmonary health, identification of both common and rare diseases, indications for procedures, interpretation of commonly ordered tests, management of acute flares of disease, and appropriate indications for referral.

Faculty will facilitate learning in the 6 core competencies as follows:

Patient Care and Procedural Skills

- I. All residents must be able to provide compassionate, culturally-sensitive, and appropriate care for patients to prevent and treat pulmonary disease.
 - PGY2s should seek directed and appropriate specialty or surgical consultation when necessary to further patient care.
 - PGY3s should supervise and ensure seamless transitions of care between primary and consulting teams and between inpatient and outpatient care.

- II. Residents will demonstrate the ability to take a pertinent history and perform a focused physical exam. PGY1s should be able to differentiate between stable and unstable patients and elicit the following historical details:
 - risk factors that predispose patients to particular infections, such as occupational or environmental exposures, recent contacts, pets, travel, vaccination history, and tobacco and alcohol use
 - sleep symptoms
 - history of respiratory symptoms and vocal changes
 - medication use

PGY2s should be able to recognize the contribution of genetic, epidemiologic, disease-related factors and comorbidities to patient's clinical picture.

PGY3s should be able to independently obtain the above details for patients with a complex history of chronic pulmonary disease and multiple comorbid conditions.

- III. Residents should be able to characterize the following physical findings:
 - PGY1s: abnormal lung sounds, dullness to percussion, thoracic cage abnormalities, prolonged expiration and pursed lip breathing, accessory muscle use and paradoxical respiration, lymphadenopathy
 - PGY2s: extrapulmonary manifestations of pulmonary disease (e.g. abnormal heart sounds, clubbing, lower extremity edema, skin and joint abnormalities)

- PGY3s: respiratory pattern (e.g. Cheyne-Stokes, Kussmaul), palpation (e.g. fremitus, diaphragmatic excursions, subcutaneous emphysema); more subtle auscultatory abnormalities (e.g. friction rub)
- IV. Residents will understand the indications, contraindications, complications, limitations, and interpretation of following procedures, and become competent in their safe and effective use:
- PGY1s: thoracentesis, peak flow meter, bedside spirometry and pulmonary function testing
 - PGY2s: basic use of noninvasive mechanical ventilation, CPAP for sleep apnea, Tuberculin and anergy panel skin tests, chest tube management
 - PGY3s: trouble-shooting with noninvasive mechanical ventilation

Medical Knowledge

- I. PGY1s will develop an understanding of the basic pathophysiology and approach to evaluation and treatment of the following presenting conditions commonly associated with pulmonary disease:
- Chest pain
 - Cough
 - Dyspnea
 - Fever with pulmonary symptoms
 - Hemoptysis
 - History of positive PPD or Tuberculosis exposure
 - Hoarseness
 - Insomnia
 - Pleural effusion
 - Pulmonary nodule
 - Pulmonary preoperative evaluation
 - Snoring or excessive daytime somnolence
 - Stridor
 - Wheezing

PGY1s will develop an understanding of the pathophysiology, clinical presentation, and therapy for the following pulmonary diseases:

- Asthma
- Atelectasis
- Bronchitis
- COPD
- Cor pulmonale
- HIV-related lung disease
- Lung cancer
- Pneumonia – aspiration, community-acquired, hospital-associated
- Pneumothorax

- Pulmonary contusion/rib fracture
- Pulmonary embolism and infarction
- Sleep apnea and obesity hypoventilation syndrome
- Tuberculosis

PGY2s will also develop an understanding of the pathophysiology, clinical presentation, targeted therapy, and duration of therapy for the following pulmonary diseases:

- Allergic bronchopulmonary aspergillosis
- Alveolar proteinosis and BOOP
- Bronchiolitis/tracheitis
- Cystic fibrosis
- Hypersensitivity pneumonitis and eosinophilic pneumonia
- Interstitial lung disease
- Laryngeal dyskinesia
- Lung abscess
- Lung colonization
- Lung transplant
- Pleural disease
- Pulmonary hypertension
- Pulmonary manifestations of systemic diseases, such as neoplasm and vasculitis and connective tissue disorders
- Respiratory muscle disorders
- Thoracic cage disorders

PGY3s should also be able to

- have an understanding of the epidemiology of the above conditions
- understand statistical concepts such as pretest probability, number needed to treat, etc. and their effect on diagnostic workup and treatment.
- for the most part, independently manage patients with evidence-based therapies
- recognize lack of response to therapy and identify possible causes and an alternate treatment plan.

II. PGY1s will be able to understand the indications for ordering and the interpretation of the following laboratory values and procedures:

- Analysis of pleural fluids
- Arterial blood gas
- Chest imaging with radiograph, CT, CT angiography, MRI, and ultrasound
- Methacholine challenge
- NT-pro-BNP
- Overnight oximetry
- Polysomnography
- PPD
- Procalcitonin
- Pulmonary angiography

- Sputum gram stain, culture, and cytology
- Sweat chloride test
- Tagged WBC scan and gallium scan
- Urine Legionella antigen
- Ventilation Perfusion Scan

PGY2s will also demonstrate knowledge of the indications for ordering and interpretation of results of:

- Bronchoscopy
- Cardiopulmonary exercise testing
- Mediastinoscopy
- Pet scanning
- Phrenic nerve studies
- Pleurodesis
- VATS and open lung biopsy

PGY3s will also independently, appropriately order studies and be able to interpret results within the context of patient comorbidities, pretest probability of disease, and patient values.

- III. Residents should be able to counsel patients appropriately on the following issues pertinent to maintaining pulmonary health:
 - Immunizations
 - Need for oxygen therapy
 - Pulmonary rehabilitation
 - Smoking cessation
 - Isolation with infectious pulmonary disease. Residents should become familiar with diagnoses requiring Public Health notification.

Practice-Based Learning and Improvement

- I. All residents should be able to access current national guidelines (e.g. www.goldcopd.com for COPD) to apply evidence-based strategies to patient care.
- II. PGY2s should develop skills in evaluating new studies in published literature, through Journal Club and independent study.
- III. All residents should participate in case-based therapeutic decision-making, involving the primary care provider, pulmonologist, and, where appropriate, surgeon.
- IV. Residents should learn to coordinate patient care as part of a larger team, including the nurse, pharmacist, respiratory therapist, dietician, and social worker to optimize patient care. PGY3s should take a leadership role.
- V. All residents should respond with positive changes to feedback from members of the health care team.

Interpersonal and Communication Skills

- I. PGY1s must demonstrate organized and articulate electronic and verbal communication skills that build rapport with patients and families, convey information to other health care professionals, and provide timely documentation in the chart.
- II. PGY2s must also develop interpersonal skills that facilitate collaboration with patients, their families, and other health professionals.
- III. PGY3s should demonstrate leadership skills to build consensus and coordinate a multidisciplinary approach to patient care.
- IV. PGY3s must be able to elicit information or agreement in situations with complex social dynamics, for example, identifying the power of attorney or surrogate decision maker, and resolving conflict among family members with disparate wishes.

Professionalism

- I. All residents must demonstrate strong commitment to carrying out professional responsibilities as reflected in their conduct, ethical behavior, attire, interactions with colleagues and community, and devotion to patient care.
- II. PGY1s should be able to educate patients and their families in a manner respectful of gender, age, culture, race, religion, disabilities, national origin, socioeconomic status, and sexual orientation on choices regarding their care.
- III. PGY2s should be able to counsel patients and families both on diagnostic and treatment decisions and on withdrawal of care.
- IV. PGY2s should be able to use time efficiently in the clinic to see patients and chart information.
- V. PGY3s should be able to provide constructive criticism and feedback to more junior members of the team.

Systems-Based Practice

- I. PGY1s must have a basic understanding that their diagnostic and treatment decisions involve cost and risk and affect quality of care.
- II. PGY2s must be able to identify current quality issues in pulmonary medicine, such as patient education and management of asthma and COPD.
- III. PGY3s must also demonstrate an awareness of alternative therapies and their costs, risks, and benefits, and how insurance coverage affects compliance.

Teaching Methods

- I. Supervised patient care in the inpatient and outpatient setting.
 - Residents will initially be directly observed with patients to facilitate the acquisition of excellent history taking and physical exam skills.
 - As residents become more proficient, they will interact independently with patients and present cases to faculty.
 - Initial emphasis will be on diagnosis and basic management.

- When residents have mastered these skills, focus will be on medical decision-making, and residents will work with supervising physicians to finalize a care plan.
- II. Conferences
 - Specialty-specific didactics
 - III. Independent study
 - Journal and Textbook reading TBD by pulmonology attending
 - Manuals and guides
 - Gilbert DN, Moellering RC, Sande MA. *The Sanford Guide to Antimicrobial Therapy*. Antimicrobial Therapy, current year.
 - CMH hospital antibiogram
 - Online educational resources
 - Asthma <https://www.nlm.nih.gov/health-topics/guidelines-for-diagnosis-management-of-asthma>
 - HIV/AIDS – www.aidsinfo.nih.gov, <http://hivinsite.ucsf.edu>, <http://www.aidsmap.com>
 - Centers for Disease Control and Prevention www.CDC.gov
 - COPD www.goldcopd.com
 - ISDA www.idsociety.org
 - Up to Date
 - Clinical Key

Evaluation

- I. Mini-CEX bedside evaluation tool
- II. Verbal mid-rotation individual feedback
- III. 360 Evaluation
- IV. Attending written evaluation of resident at the end of the month based on rotation observations and chart review.

Rotation Structure

- I. Residents should contact pulmonology attending the day prior to determine start time and location.
- II. Residents interested in focusing on sleep disturbances and disorders should notify the attending at the beginning of the rotation. Additional elective time in sleep medicine can also be arranged.
- III. Residents should divide their time between the hospital and the clinic as appropriate to achieve the above educational goals.
 - Rotations are a “hands-on” learning experience. If you have a resident, send them in to see a patient.
 - If the same patient returns during the rotation, send the resident in to see the follow-up.
 - Case-based learning is very effective. Give your resident patient-based questions to research and report back to you.

- Consider having your resident do a short presentation to the group on a pertinent topic.
 - When doing consults, ensure the resident understands the question asked and provides a concise answer.
- IV. Call and weekend responsibilities TBD by the attending physician.
- Hours worked must be consistent with ACGME requirements and are subject to approval by the Program Director.
- V. Residents have specialty-specific didactics and should be excused in a timely fashion to attend.