I. EDUCATIONAL GOALS AND OBJECTIVES OF ROTATION

The main goal of this one month Pulmonary/Critical Care Medicine Consultation (e.g., Consult) service rotation is to provide the environment, resources, and structured educational opportunities for fellows in pulmonary disease/critical care medicine and fellows in straight critical care medicine to acquire knowledge of, and have clinical experience with a broad spectrum of acute and chronic pulmonary diseases. The corollary objective is to facilitate the development of the necessary skills, professional attitudes, and commitment to scholarship requisite for clinical competence and effectiveness as a pulmonary disease specialist.

These educational and behavioral aspects of training are provided by patient encounters and progressive responsibility for patient management, supervised procedures including flexible fiberoptic bronchoscopy, didactic sessions, and directed self-study so that the fellow develops expertise in the diagnosis and management of a broad diversity of acute and chronic disorders of the respiratory system. The management of patients in the inpatient setting is complemented by opportunity for longitudinal follow-up of discharged patients by the same fellow in his/her Ambulatory Pulmonary Clinic.

Specific Accreditation Council of Graduate Medical Education Curricular Program Content: Clinical Experiences and Technical Areas Covered:

XI.C.1; XI.C.2.b
XIII.A; XIII.B.1.2.3; XIII.C.1.2.3.4
XIII.E.1.4
XIV.A.1.a.b.c.d.e.f.g.h.i.k.l.m.n.
XIV.A.2.d.f.h.j.
XIV.A.3.c.e.f.
XIV.A.4.a.b.c.d.e.g.
XIV.B.1.a.b (1)(2)(3).c.d.e.f.g.h.i.
XIV.B.2.c.d.
XIV.C.1.2.c.;7.13.

Specific Objectives of the Pulmonary/Critical Care Medicine Consult Service Rotation

1. To enable fellows to develop the necessary understanding and familiarity with the cognitive, procedural, ethical, attitudinal, and communication skills requisite to clinical
competence in pulmonary/critical care medicine consultative medicine, in conjunction with achievement of the 6 core AGGME competencies of patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.

2. To foster the ability to synthesize relevant information from a focused orderly review of the patient’s clinical history, review of the medical record, physical examination of the respiratory system, and relevant laboratory data including special diagnostic procedures into a comprehensive, problem-oriented diagnostic and therapeutic plan in accordance with the best current evidence-based medical guidelines, clinical literature, and official recommendations of professional societies of thoracic medicine and respiratory care.

3. To ground the resident in the knowledge base and skills to effectively diagnose, treat, and prevent specific pulmonary diseases including, but not limited to the following:
   
   - Obstructive lung diseases, including asthma, bronchitis, emphysema, bronchiectasis, and cystic fibrosis
   - Pulmonary malignancy - primary and metastatic
   - Pulmonary infections, including tuberculous, fungal, viral, and those in the immunocompromised host
   - Diffuse interstitial lung disease
   - Pulmonary vascular diseases, including primary and secondary pulmonary arterial hypertension, vasculitis, and pulmonary hemorrhage syndromes
   - Occupational and environmental lung disease
   - Iatrogenic lung diseases, including drug-induced pulmonary disease
   - Acute lung injury, including radiation, inhalation, and trauma
   - Pulmonary manifestations of systemic diseases, including collagen-vascular diseases and those that are primary in other organs
   - Respiratory failure, including the acute respiratory distress syndrome (ARDS), acute and chronic respiratory failure in obstructive lung diseases, and respiratory failure secondary to disorders of the neuromuscular system/ respiratory drive
   - Disorders of the pleura and mediastinum
   - Genetic and developmental disorders of the respiratory system
   - Sleep disorders.
4. To develop knowledge concerning the indications, contraindications, limitations, and complications of the following procedures and practices in pulmonary/critical care medicine, and sufficient experience in their performance to develop clinical competency in patient care. These include, but are not limited to:

- thoracostomy tube insertion and drainage as well as thoracostomy tube management, and pleural drainage and instillation of sclerosing agents for pleurodesis
- diagnostic and therapeutic thoracentesis and closed pleural biopsy
- flexible fiberoptic bronchoscopy, including bronchoalveolar lavage, bronchial and transbronchial lung biopsy, transbronchial needle (Wang) biopsy of mediastinal lymph nodes, endobronchial masses, and peripheral lesions, fiberoptically-assisted endotracheal intubation, performance of protected microbial and cytology brushings, and advanced pulmonary interventional bronchoscopy skills including endobronchial ultrasound (EBUS)-assisted fine needle aspiration of mediastinal lymph nodes, central airway lesions, and peripheral airways lesions, cryotherapy, and argon laser therapy
- pulmonary function testing, including tests of respiratory drive and mechanics, gas exchange, spirometry, flow-volume studies, diffusion capacity, arterial blood gas analysis, and exercise studies
- noninvasive and mechanical ventilatory support, weaning, and related respiratory care techniques
- management of pneumothorax (needle insertion and drainage systems)
- examination and interpretation of sputum, bronchopulmonary secretions, pleural fluid/tissue, and lung tissue for infectious agents; cytology, and histopathology
- endotracheal intubation via nasotracheal and orotracheal techniques; bag-mask ventilation; use of reservoir masks and continuous positive pressure masks for delivery of supplemental oxygen, humidifiers, nebulizers, and incentive spirometry
- arterial puncture and blood sampling; arterial line placement
- insertion of central venous and pulmonary artery balloon flotation catheters
- placement of brachytherapy catheters for intrabronchial irradiation of neoplasms
- percutaneous tracheostomy and management of tracheostomy tubes
• performance and interpretation of pulmonary function tests including exercise studies

• overnight pulse oximetry evaluation and polysomnography for sleep disorders.

5. To develop the knowledge and ability to interpret the following imaging procedures as they relate to the evaluation of the patient with pulmonary disease:

• chest roentgenograms and computed axial tomographic (CAT) scans of the sinuses and chest, including high resolution CAT scans, radionuclide scans including ventilation/perfusion lung imaging and positron emission tomographic (PET) and PET/C(A)T scanning

• diagnostic fluoroscopy and localization of lung lesions; radiation safety.

6. To provide practical opportunities for clinical-pathological correlation concerning disease-specific pathological findings of the upper and lower respiratory tracts, and integration of these data with clinical findings in formulating comprehensive care plans.

7. To provide organized opportunities to learn about former patients after hospital discharge by any of the following mechanisms:

• longitudinal follow-up in the fellow’s ambulatory pulmonary continuity clinic

• case-specific discussion and review of physiological, radiographic, and pathological data at the bi-weekly Multidisciplinary Chest Conference, weekly Lung Cancer Multi-Disciplinary Tumor Conference, and the weekly Tuesday Pulmonary Disease/Critical Care Medicine didactic conference

• access to and provision of anatomic-pathologic reports.

8. To provide instruction and experience in pulmonary physiology and its correlation with lung structure-function relationships, pulmonary function testing, exercise physiology, and clinical manifestations of pulmonary disease.

9. To provide opportunities to learn the elements of ethical decision-making, informed consent, and cost-effective care, including the process of ambulatory care and appropriate referral of critically ill patients to long-term acute care hospitals (LTACHs).

10. To provide instruction and experience in the principles, objectives, and processes of continuous quality assessment and improvement as well as risk management as these issues relate to the care of patients with pulmonary diseases and disorders in the ICU and medical-surgical ward settings.

11. To provide the environment and resources for fellows to develop expertise in monitoring and supervising the delivery of respiratory care services.
12. To learn about the available devices for continuous delivery of oxygen in the inpatient and ambulatory care settings as well as their relative advantages, disadvantages, and costs.

13. To furnish structured and informal opportunities for teaching of residents in internal medicine, surgery, and other medical disciplines as well as medical students, nursing, and respiratory care personnel.

14. To provide opportunities for learning effective verbal and written interpersonal communication skills with respect to referring physicians, patients, their families, and health care team members.

II. PRINCIPAL METHODOLOGIES FOR TEACHING AND EDUCATIONAL SELF-ASSESSMENT DURING ROTATION

The following methods are utilized for teaching during this rotation:

1. Clinical experience and instruction by faculty members of the Division of Pulmonary, Critical Care and Sleep Medicine, subspecialty and inter-disciplinary consultants and referring physicians.

2. Clinical experience and instruction by divisional, departmental, and inter-departmental faculty during performance of the above-listed procedures (see # 4), personal and supervised review of radiologic imaging procedures and cytological as well as histopathological specimens.

3. Fellow attendance at didactic sessions including the Wednesday clinical curriculum conference, pulmonary/critical care grand rounds, chest conference, pulmonary research conference, pulmonary journal club, and current topics in pulmonary medicine conference (e.g., alternating on each Tuesday of the week and constituting the Division of Pulmonary, Critical Care and Sleep Medicine’s principal formal educational session), weekly Internal Medicine Grand Rounds, and weekly Lung Cancer Multi-Disciplinary Tumor Conference.

4. Didactic instruction by attendance sponsored by the program director at least 1 national resident-specific conferences per year (e.g., the American Thoracic Society, American College of Chest Physicians, and/or Society of Critical Care Medicine), and attendance at the corresponding clinical and scientific symposia of the respective professional society.

5. Critical self-study of textbooks and periodicals of pulmonary diseases, current published literature of pulmonary/critical care medicine, the bibliography of the pulmonary/critical care MKSAP syllabus available in the division; divisional teaching files and audiovisual materials.
6. Divisional sponsorship of each fellow to take the national in-service training examination for pulmonary disease and critical care medicine sponsored by the American College of Chest Physicians (beginning in 2007 corresponding to the first time that this test has been available).

III. METHODS OF EVALUATION OF ROTATION

Evaluation of Residents’ Performance on the Rotation

1. Fellow performance during the pulmonary/critical care medicine consultation service rotation is quantitatively evaluated in writing at the end of the rotation on a 1-9 point scale (see attached form), along with specific comments, for the 6 ACGME core competencies as they relate to pulmonary disease and critical care medicine:

- Patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

Rotation-specific evaluation elements:

* The fellow is expected to develop superb, accurate medical interviews, physical examination skills, and meticulous attention to detail in reviewing other data and reports, and become completely knowledgeable about the patient’s previous diagnostic and/or treatment regimens, as they apply to the pulmonary disease/critical care medicine consultative question under consideration.

* The fellow takes the initiative when necessary to obtain the results of previously performed thoracic imaging studies, bronchoscopy reports, pathology reports, and related materials that may have a bearing on the patient’s current clinical problem.

* The fellow is expected to take advantage of the opportunity to learn flexible fiberoptic bronchoscopy and specific airway anatomical details in the Simulation Skills Center of Saint Louis University School of Medicine.

- Medical knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care

* The fellow shows evidence of highly resourceful development of knowledge, including systematic case- and topic-oriented reading in at least one major textbook of pulmonary disease and critical care medicine, retrieval and sharing among consultation service team members of relevant evidence-based medicine articles from the National Library of Medicine, and striving for expertise in basic cardiopulmonary physiology.

* The fellow shows evidence of applied reading and understanding of the physiological basis for application of noninvasive positive-pressure ventilation, as well as its
indications for treatment of patients with acute, acute-on-chronic, and chronic respiratory failure.

- Practice-based learning and improvement that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.

**Rotation-specific evaluation elements:**

* The fellow shows familiarity in the application of evidence-based guidelines concerning asthma severity stratification (e.g., National Asthma Education and Prevention Program), classification of pulmonary arterial hypertension (e.g., the Venice criteria of the Pulmonary Hypertension Association), and chronic obstructive pulmonary disease severity (e.g., by Global Initiative for Chronic Obstructive Lung Disease criteria).

* The fellow personally follows-up the results of flexible fiberoptic bronchoscopy procedures he/she has performed, in terms of microbiological results, cytology reports, and histopathological interpretations and final reports.

* The fellow routinely compares and contrasts his/her diagnostic impressions from personal review of the patient’s thoracic imaging studies to those articulated on formal radiological reports, to improve his/her quality of patient care and to identify areas for future focused learning.

  - Interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.

**Rotation-specific evaluation elements:**

* The fellow develops and shows evidence of superior verbal and telephonic communication skills with referring in-hospital physicians, outside referring physicians, residents and medical students, and all members of the health care team, including nurses, respiratory care professionals, bronchoscopy lab personnel, and pulmonary function/exercise laboratory technologists.

* The fellow manifests superior communication skills in discussing aspects of the patient’s care with the patient and his/her family members, showing the ability to clarify clinical information, succinctly identify the patient’s principal pulmonary disease/critical care medicine problems, and obtain truly informed consent for bronchoscopy, thoracentesis, and other invasive procedures.

  - Professionalism as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

**Rotation-specific evaluation elements:**
* The fellow will demonstrate respect and compassion to all patients and their families, referring physicians, and members of the health care team. This includes willingness to rapidly respond to requests for consultations.

* The fellow is expected to be consistently prompt and on time for all scheduled patient-care related events, including but not limited to bronchoscopy procedures, exercise studies, as well as for educational conferences.

* The fellow is expected to manifest accuracy and professional attention to detail in the completion of microbiology, cytology, and anatomic pathology request forms pertaining to patient specimens following bronchoscopy procedures.

* The fellow is expected to model responsible behavior to all junior members of the pulmonary/critical care consultative service team, including residents in internal medicine and medical students.

  • Systems-based practice as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

Rotation-specific evaluation elements:

* The fellow will develop progressively greater independence and initiative in the process of patient care coordination and ongoing titration of care based on results of de novo clinical and laboratory testing results.

* The fellow enthusiastically assists in developing systems improvements in bronchoscopy scheduling, performance; introduction of new interventional pulmonology procedures; and referral of patients discharged from the hospital to follow-up ambulatory pulmonary care.

2. Pulmonary/critical care medicine consultation service attending faculty review the performance of each fellow with him/her at the end of the rotation. Any fellow demonstrating problems in any one of the above areas or unsatisfactory performance receive an additional mid-month counseling session with the faculty member.

   Evaluations in the superior range (e.g., 7-9) are generally reserved for those individuals who demonstrate specific and overall competencies expected for a fellow one year ahead in the training program. For third year fellows junior attending-level performance is the benchmark criterion.

3. Documentation of adequate procedural experience on this rotation by each fellow is maintained in individual electronic logs within the New Innovations software; these records are supplemented by a divisional electronic database for each fellow.
4. The Program Director provides formal semi-annual feedback of the fellow’s performance, including that on the **Pulmonary/Critical Care Medicine Consultation Service Rotation**, along with *ad hoc* feedback and counseling as indicated.

5. On a long-term basis, fellow mastery of the principles and knowledge base of pulmonary disease and critical care medicine deriving from this rotation are evaluated by the pass rates on subspecialty American Board of Internal Medicine board examinations in pulmonary diseases and critical care medicine, with expected pass rates of 100% of first-time takers on each examination.

**Evaluation of the Rotation and Faculty by Fellows**

1. Faculty of the pulmonary consult service rotation are formally evaluated in writing by residents at the end of each monthly rotation on a 1-5 point scale (*see attached form*) in the following areas:
   - availability
   - organization of the delivery of patient care and rounds
   - teaching (*e.g.*, focus, effectiveness at the bedside, emphasis on problem-solving)
   - fund of knowledge for pulmonary diseases and critical care medicine
   - interpersonal relations with patients and with the health care team
   - recommendations for future rounding
   - overall written comments

2. Fellows confidentially evaluate in writing each faculty member of the training program in relation to their performance on the **Pulmonary/Critical Care Medicine Consultation Service Rotation** and elsewhere on an annual basis.

3. All fellows in the pulmonary disease/critical care medicine training program participate with SLUH program faculty of the Division of Pulmonary, Critical Care and Sleep Medicine at the semi-annual divisional Clinical and Educational Retreat, wherein the goals and objectives of the **Pulmonary/Critical Care Medicine Consultative Service Rotation** are reviewed, as well as the program’s effectiveness in achieving them.

4. Fellows have the opportunity to provide the Program Director with specific feedback concerning each faculty member’s performance during their semi-
annual evaluations and to the Program Director and Co-Director on an ad hoc basis, so that appropriate corrective actions may be taken.

IV. RESOURCES OF THE INSTITUTION

A. Strengths

The resources of Saint Louis University that serve as strengths supporting the educational goals, objectives and curriculum of the Pulmonary/Critical Care Medicine Consultation Service Rotation include the following factors:

Personnel

1. Fully-staffed Department of Respiratory Care under the supervision of the Program Co-Director in the Division of Pulmonary, Critical Care and Sleep Medicine for provision of comprehensive respiratory care and bronchoscopy services. These services include conventional and noninvasive mechanical ventilatory support, inhaled nitric oxide, helium:oxygen gas mixtures, and assistance with bronchoscopy procedures in the 3rd Floor Bronchoscopy Suite of Saint Louis University Hospital or at the bedside of critically ill intubated patients in the intensive care units (ICU’s).

2. Trained endoscopy suite nurses and other support personnel for assistance during fiberoptic bronchoscopies of inpatients and ambulatory patients.

3. Fully-staffed Pulmonary Function/Exercise Laboratory personnel under the supervision of an experienced and academically oriented Director, who with the Medical Director of the Pulmonary Function/Exercise Laboratory, serve as key program faculty in the Division of Pulmonary, Critical Care and Sleep Medicine.

4. Recently-hired Medical Director-designate of the SLUCare Sleep Center at Saint Louis University Medical Center who likewise serves as a key program faculty in the Division of Pulmonary, Critical Care and Sleep Medicine.

5. Availability of an experienced Advance Nurse Practitioner specializing in pulmonary disease within the Division of Pulmonary, Critical Care and Sleep Medicine, who is also a faculty member (assistant professor) in the Department of Internal Medicine.

6. Vascular Laboratory personnel with stationary and portable equipment for performance of Doppler ultrasonographic examination of the extremities for evaluation of venous thromboembolic disease.

6. Consultative availability by Department of Internal Medicine faculty for all subspecialty problems in internal medicine, including infectious diseases,
cardiovascular medicine, gastroenterology, hepatology, nephrology, hematology/oncology, endocrinology/metabolism, geriatrics, ethics, dermatology, and rheumatology; subspecialty-specific diagnostic and therapeutic procedural support. Consultative availability of thoracic and cardiothoracic surgical expertise, neurology, and Interventional Radiology (e.g., for percutaneous drainage of loculated thoracic and non-thoracic fluid collections).

7. Consultative availability by faculty of the Department of Cardiothoracic Surgery for inter-disciplinary patient management, most notably in regard to interventional pulmonology, including use of airway stents for benign and malignant airway obstruction, endobronchial laser therapy, and management of massive hemoptysis.

8. Fully-staffed Department of Radiation Oncology for inter-disciplinary management of local and metastatic complications of pulmonary neoplastic diseases, including brachytherapy catheter placement, Cyber-Knife technology, and virtual bronchoscopy.

9. Adult Cystic Fibrosis Center nursing, rehabilitation, and other support personnel, with the Medical Director of the Adult Cystic Fibrosis Program serving as a key program faculty in the Division of Pulmonary, Critical Care and Sleep Medicine.

**Equipment**

1. Bronchoscopy Suite equipped with equipment including bronchoscopes, video imaging systems, and fluoroscopy.

2. Hospital-wide MediTech clinical information management system and workstations for rapid specimen entry, laboratory testing and ordering, and data archiving and retrieval of all inpatient and outpatient patient-specific laboratory, pathological, radiological, and pharmacological data.

3. Fully-equipped Pulmonary Function/Exercise Laboratory including exercise testing capability.

**Support Services/Other**

1. Active pulmonary rehabilitation, physical therapy, occupational therapy, pastoral care, visiting nurse, and home respiratory care services.

2. Availability of interventional radiology services.