



ACGME International

**Advanced Specialty Program Requirements for
Graduate Medical Education in
Pulmonary Disease and
Critical Care Medicine
(Internal Medicine)**

Initial approval: 01/09/2019

**ACGME International Advanced Specialty Program Requirements
for Graduate Medical Education in
Pulmonary Disease and Critical Care Medicine (Internal Medicine)**

I. Introduction

I.A. Definition and Scope of Specialty

Pulmonary disease medicine focuses on the etiology, diagnosis, prevention, and treatment of diseases affecting the lungs and related organs. Critical care medicine includes the diagnosis, management, and prevention of complications in patients who are severely ill and require intensive monitoring and/or organ system support. Pulmonary disease and critical care medicine fellowships provide advanced education to allow the fellow to acquire competence in these subspecialties with sufficient expertise to act as an independent consultant.

I.B. Duration of Education

I.B.1. The education program in pulmonary disease and critical care medicine must be 36 or 48 months in length.

II. Institutions

II.A. Sponsoring Institution

II.A.1. A pulmonary disease and critical care medicine fellowship must function as an integral part of an ACGME-I-accredited residency in internal medicine.

II.A.2. The primary clinical site should have at least three ACGME-I-accredited internal medicine subspecialty programs from the following disciplines: cardiovascular disease; gastroenterology; infectious diseases; nephrology; or pulmonary disease.

II.A.3. The Sponsoring Institution must:

II.A.3.a) establish the fellowship within a department of internal medicine or an administrative unit whose primary mission is the advancement of internal medicine subspecialty education and patient care; and,

II.A.3.b) provide the program director with adequate support for the administrative activities of the fellowship.

II.A.4. The Sponsoring Institution and participating sites must share appropriate inpatient and outpatient faculty performance data with the program director.

II.B. Participating Sites

See International Subspecialty Foundational Requirements, Section I.B.

III. Program Personnel and Resources

III.A. Program Director

- III.A.1. The program director must:
- III.A.1.a) monitor fellow stress, including mental or emotional conditions inhibiting performance or learning, and drug- or alcohol related dysfunction;
 - III.A.1.b) provide access to timely confidential counseling and psychological support services to fellows;
 - III.A.1.c) evaluate and modify situations that demand excessive service or consistently produce undesirable stress on fellows;
 - III.A.1.d) ensure that fellows' service responsibilities are limited to patients for whom the teaching service has diagnostic and therapeutic responsibility; and,
 - III.A.1.e) participate in academic societies and educational programs designed to enhance his or her educational and administrative skills.

III.B. Faculty

- III.B.1. Faculty members must teach and supervise fellows in the performance and interpretation of procedures.
- III.B.1.a) This must be documented in each fellow's record, including indications, outcomes, diagnoses, and supervisor(s).
- III.B.2. In addition to the program director, there must be at least three core faculty members.
- III.B.2.a) For programs with more than nine fellows, there must be at least one core faculty member for every 1.5 fellows.
- III.B.3. Core faculty members must be active clinicians with knowledge of, experience in, and commitment to pulmonary disease and/or critical care medicine as a specialty.
- III.B.4. Core faculty members must assist the program director in planning, implementing, monitoring, and evaluating fellows' clinical and research education.
- III.B.4.a) At least one core faculty member must be knowledgeable in evaluation and assessment of the ACGME-I Competencies and devote significant time to evaluating fellows, including direct observation.

- III.B.5. At least 50 percent of core faculty members, averaged over three years, must demonstrate evidence of scholarship, including obtaining peer-reviewed funding, or publishing original research, review articles, editorials, or case reports in peer-reviewed journals, or chapters in textbooks.
- III.B.6. Clinical faculty members with certification and/or expertise in cardiology, gastroenterology, hematology, infectious disease, nephrology, and oncology must regularly participate in the program.
- III.B.7. Clinical faculty members from anesthesiology, cardiovascular surgery, emergency medicine, general surgery, neurological surgery, neurology, obstetrics and gynecology, orthopaedic surgery, thoracic surgery, urology, and vascular surgery must be available to participate in the program.

III.C. Other Program Personnel

- III.C.1. There must be services available from other health care professionals, including dietitians, language interpreters, nurses, occupational therapists, physical therapists, and social workers.
- III.C.2. Personnel must include nurses and technicians skilled in critical care instrumentation, respiratory function, and laboratory medicine.
- III.C.3. There must be appropriate and timely consultation from other specialties.

III.D. Resources

- III.D.1. The Sponsoring Institution must provide the broad range of facilities and clinical support services required to provide comprehensive care of adult patients.
- III.D.2. Inpatient and outpatient systems must be in place to prevent fellows from performing routine clerical functions, such as scheduling tests and appointments, and retrieving records and letters.
- III.D.3. Critical care unit(s) must be located in a designated area within the hospital, and must be constructed and designed specifically for the care of critically-ill patients.
 - III.D.3.a) Whether operating in separate locations or as combined facilities, the program must provide the equivalent of a medical intensive care unit (MICU), a surgical intensive care unit (SICU), and a coronary intensive care unit (CICU).
 - III.D.3.a).(1) The MICU or its equivalent must be at the primary clinical site, and should be the focus of a teaching service.
- III.D.4. There must be facilities to care for patients with acute myocardial infarction, severe trauma, shock, recent open heart surgery, recent major thoracic or abdominal surgery, and severe neurologic and neurosurgical conditions.

- III.D.5. Laboratory and imaging services must be available, including:
- III.D.5.a) a supporting laboratory that provides complete and prompt laboratory evaluation;
 - III.D.5.b) a pulmonary function testing laboratory;
 - III.D.5.c) timely bedside imaging services for patients in the critical care units;
 - III.D.5.d) computed tomography (CT) imaging, to include CT angiography; and,
 - III.D.5.e) a bronchoscopy suite, to include appropriate space and staffing for pulmonary procedures.
- III.D.6. Support services must be available, including:
- III.D.6.a) an active emergency service;
 - III.D.6.b) an active open heart surgery program;
 - III.D.6.c) general surgical support;
 - III.D.6.d) nutritional support services;
 - III.D.6.e) otolaryngology service;
 - III.D.6.f) pathology services, to include exfoliative cytology;
 - III.D.6.g) post-operative care and respiratory care services; and,
 - III.D.6.h) a thoracic surgery service.
- III.D.7. A sufficient number of patients of each gender and a broad range of ages must be available to allow each fellow to achieve the required educational outcomes.
- III.D.7.a) The program must provide opportunities to manage adult patients with a wide variety of serious illnesses and injuries requiring treatment in a critical care setting.
 - III.D.7.b) There must be an average daily census of at least five patients per fellow during assignments to critical care units.
- III.D.8. Other services should be available, including anesthesiology, immunology, laboratory medicine, microbiology, occupational medicine, otolaryngology, pathology, physical medicine and rehabilitation, and radiology.

IV. Fellow Appointment

IV.A. Eligibility Criteria

- IV.A.1. Prior to appointment in the program, fellows should have completed an ACGME-I-accredited core specialty program in internal medicine, or an internal medicine residency acceptable to the Sponsoring Institution's Graduate Medical Education Committee.

IV.B. Number of Fellows

See International Subspecialty Foundational Requirements, Section III.B.

V. Specialty-Specific Educational Program

V.A. Regularly Scheduled Didactic Sessions

- V.A.1. The curriculum must include a didactic program based upon the core knowledge content in pulmonary disease and critical care medicine.
- V.A.2. The program must afford each fellow an opportunity to review topics covered in conferences that he or she was unable to attend.
- V.A.3. Fellows must participate in clinical case conferences, journal clubs, research conferences, and morbidity and mortality or quality improvement conferences.

V.B. Clinical Experiences

- V.B.1. Fellows must have at least 18 months of clinical experience including:
- V.B.1.a) at least nine months of patient care responsibility for inpatients and outpatients with a wide variety of pulmonary diseases, with an educational emphasis on pulmonary physiology and its correlation with clinical disorders;
- V.B.1.b) at least nine months in critical care medicine, of which at least six months must be devoted to the care of critically-ill medical patients (MICU/CICU or equivalent); and,
- V.B.1.c) at least three months devoted to the care of critically-ill non-medical patients (SICU, Burn Unit, Transplant Unit, Neurointensive Care Unit, or equivalent).
- V.B.1.c).(1) This experience should consist of at least one month of direct patient care activity, with the remainder being fulfilled with either consultative activities or with direct care of such patients.
- V.B.2. Programs that are 36 months in length must have no more than 15 months of required intensive care unit experiences.

- V.B.3. Programs that are 48 months in length must have no more than 20 months of required intensive care unit experiences.
- V.B.4. Fellows must participate in training using simulation.
- V.B.5. Fellows must have experience in the role of a pulmonary disease consultant in both the inpatient and outpatients settings and as a critical care medicine consultant in the inpatient setting.
- V.B.6. Fellow experiences must include:
 - V.B.6.a) continuing responsibility for both acutely- and chronically-ill pulmonary patients in order to learn both the natural history of pulmonary disease and the effectiveness of therapeutic programs;
 - V.B.6.b) managing adult patients with a wide variety of serious illnesses and injuries requiring treatment in a critical care setting;
 - V.B.6.c) clinical experience in examination and interpretation of lung tissue for infectious agents, cytology, and histopathology; and,
 - V.B.6.d) clinical experience in patient evaluation and management, including for patients:
 - V.B.6.d).(1) with genetic and developmental disorders of the respiratory system, to include cystic fibrosis;
 - V.B.6.d).(2) undergoing pulmonary rehabilitation;
 - V.B.6.d).(3) with trauma;
 - V.B.6.d).(4) with neurosurgical emergencies;
 - V.B.6.d).(5) with critical obstetric and gynecologic disorders; and,
 - V.B.6.d).(6) after discharge from the critical care unit.
- V.B.7. Fellow clinical experience should include the placement of percutaneous tracheostomies.
- V.B.8. Fellows should have a structured continuity ambulatory clinic experience that exposes them to the breadth and depth of pulmonary critical care medicine.
 - V.B.8.a) This experience should include an appropriate distribution of patients of each gender and a diversity of ages.
 - V.B.8.b) This experience should average one half-day each week throughout the educational program.

V.B.8.b).(1) Up to six months may be exempted from ambulatory experiences during MICU rotations, other time-intensive rotations, or vacation

V.B.8.c) Each fellow should be responsible, on average, for four to eight patients during each half-day session.

V.B.8.d) Fellows should be informed of the status of their continuity patients when such patients are hospitalized, as clinically appropriate.

V.C. Fellows' Scholarly Activities

See International Subspecialty Foundational Requirements, Section III.B.

V.D. Duty Hour and Work Limitations

V.D.1. Direct supervision of procedures performed by each fellow must occur until competence has been acquired and documented by the program director.

VI. ACGME-I Competencies

VI.A. Patient Care

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows must demonstrate proficiency in:

VI.A.1. the practice of health promotion, disease prevention, diagnosis, care, and treatment of patients of each gender, from adolescence to old age, during health and all stages of illness;

VI.A.2. prevention, evaluation, and management of both inpatients and outpatients with:

VI.A.2.a) acute lung injury, including radiation, inhalation, and trauma;

VI.A.2.b) acute metabolic disturbances, including overdosages and intoxication syndromes;

VI.A.2.c) anaphylaxis and acute allergic reactions in the critical care unit;

VI.A.2.d) cardiovascular disease in the critical care unit;

VI.A.2.e) circulatory failure;

VI.A.2.f) detection and prevention of iatrogenic and nosocomial problems in critical care medicine;

VI.A.2.g) diffuse interstitial lung disease;

VI.A.2.h) disorders of the pleura and the mediastinum;

- VI.A.2.i) end-of-life issues and palliative care;
- VI.A.2.j) hypertensive emergencies;
- VI.A.2.k) iatrogenic respiratory diseases, including drug-induced disease;
- VI.A.2.l) immunosuppressed conditions in the critical care unit;
- VI.A.2.m) metabolic, nutritional, and endocrine effects of critical illness, and hematologic and coagulation disorders associated with critical illness;
- VI.A.2.n) multi-organ system failure;
- VI.A.2.o) obstructive lung diseases, including asthma, bronchitis, emphysema, and bronchiectasis;
- VI.A.2.p) occupational and environmental lung diseases;
- VI.A.2.q) peri-operative critically-ill patients, including hemodynamic and ventilator support;
- VI.A.2.r) psychosocial and emotional effects of critical illness in patients and their families;
- VI.A.2.s) pulmonary embolism and pulmonary embolic disease;
- VI.A.2.t) pulmonary infections, including tuberculous, fungal, and infections in the immunocompromised host, such as human immunodeficiency virus (HIV) infection-related infections;
- VI.A.2.u) pulmonary malignancy, both primary and metastatic;
- VI.A.2.v) pulmonary manifestations of systemic diseases, including collagen vascular disease and diseases that are primary in other organs;
- VI.A.2.w) pulmonary vascular disease, including primary and secondary pulmonary hypertension and the vasculitis and pulmonary hemorrhage syndromes;
- VI.A.2.x) renal disorders in the critical care unit, including electrolyte and acid-base disturbance and acute renal failure;
- VI.A.2.y) respiratory failure, including the acute respiratory distress syndrome, acute and chronic respiratory failure in obstructive lung diseases, and neuromuscular respiratory drive disorders;
- VI.A.2.z) sepsis and sepsis syndrome;
- VI.A.2.aa) severe organ dysfunction resulting in critical illness, including disorders of the gastrointestinal, neurologic, endocrine, hematologic, musculoskeletal, and immune systems, as well as infections and malignancies;

- VI.A.2.bb) shock syndromes; and,
- VI.A.2.cc) sleep-disordered breathing.
- VI.A.3. Fellows must be able to perform all medical, diagnostic, and surgical procedures considered essential for the area of practice. Fellows must demonstrate competence in:
 - VI.A.3.a) interpreting data derived from various bedside devices commonly employed to monitor patients, and data from laboratory studies related to sputum, bronchopulmonary secretions, pleural fluid; and,
 - VI.A.3.b) procedural and technical skills, including:
 - VI.A.3.b).(1) airway management;
 - VI.A.3.b).(2) the use of a variety of positive pressure ventilator modes, to include:
 - VI.A.3.b).(2).(a) initiation and maintenance of ventilator support;
 - VI.A.3.b).(2).(b) respiratory care techniques; and,
 - VI.A.3.b).(2).(c) withdrawal of mechanical ventilator support.
 - VI.A.3.b).(3) the use of reservoir masks and continuous positive airway pressure masks for delivery of supplemental oxygen, humidifiers, nebulizers, and incentive spirometry;
 - VI.A.3.b).(4) flexible fiber-optic bronchoscopy procedures, to include those where endobronchial and transbronchial biopsies, and transbronchial needle aspiration are performed;
 - VI.A.3.b).(4).(a) Each fellow must perform a minimum of 100 such procedures.
 - VI.A.3.b).(5) pulmonary function tests to assess respiratory mechanics and gas exchange, to include spirometry, flow volume studies, lung volumes, diffusing capacity, arterial blood gas analysis, exercise studies, and interpretation of the results of bronchoprovocation testing using methacholine or histamine;
 - VI.A.3.b).(6) diagnostic and therapeutic procedures, to include paracentesis, lumbar puncture, thoracentesis, endotracheal intubation, and related procedures;
 - VI.A.3.b).(7) use of chest tubes and drainage systems;
 - VI.A.3.b).(8) insertion of arterial, central venous, and pulmonary balloon flotation catheters;

- VI.A.3.b).(9) operation of bedside hemodynamic monitoring systems;
- VI.A.3.b).(10) emergency cardioversion;
- VI.A.3.b).(11) interpretation of intracranial pressure monitoring;
- VI.A.3.b).(12) nutritional support;
- VI.A.3.b).(13) use of ultrasound techniques to perform thoracentesis and place intravascular and intracavitary tubes and catheters;
- VI.A.3.b).(14) use of transcutaneous pacemakers; and,
- VI.A.3.b).(15) use of paralytic agents and sedative and analgesic drugs in the critical care unit.

VI.B. Medical Knowledge

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows must demonstrate proficiency in their knowledge of:

- VI.B.1. the scientific method of problem solving and evidence-based decision making;
- VI.B.2. indications, contraindications, and techniques for, and limitations, complications, and interpretation of results of those diagnostic and therapeutic procedures integral to the discipline, including the appropriate indications for and use of screening tests and procedures;
- VI.B.3. the indications, contraindications, and complications of placement of percutaneous tracheostomies;
- VI.B.4. imaging techniques commonly employed in the evaluation of patients with pulmonary disease or critical illness, including the use of ultrasound;
- VI.B.5. monitoring and supervising special services, including:
 - VI.B.5.a) respiratory care units;
 - VI.B.5.b) pulmonary function laboratories, to include quality control, quality assurance, and proficiency standards; and,
 - VI.B.5.c) respiratory care techniques and services.
- VI.B.6. the basic sciences, with particular emphasis in:
 - VI.B.6.a) genetics and molecular biology as they relate to pulmonary diseases;

- VI.B.6.b) developmental biology; and,
- VI.B.6.c) pulmonary physiology, to include cell and molecular biology and immunology, as they relate to pulmonary disease.
- VI.B.7. indications, complications, and outcomes of lung transplantation;
- VI.B.8. pericardiocentesis;
- VI.B.9. percutaneous needle biopsies;
- VI.B.10. renal replacement therapy;
- VI.B.11. pharmacokinetics, pharmacodynamics, and drug metabolism and excretion in critical illness;
- VI.B.12. principles and techniques of administration and management of a MICU;
- VI.B.13. ethical, economic, and legal aspects of critical illness;
- VI.B.14. recognition and management of the critically-ill from disasters, including those caused by chemical and biological agents; and,
- VI.B.15. the psychosocial and emotional effects of critical illness on patients and their families.

VI.C. Practice-based Learning and Improvement

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.

- VI.C.1. Fellows must obtain procedure-specific informed consent by competently educating patients about rationale, techniques, and complications of procedures.

VI.D. Interpersonal and Communication Skills

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

VI.E. Professionalism

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

- VI.E.1. Fellows must demonstrate high standards of ethical behavior, including maintaining appropriate professional boundaries and relationships with other physicians and other health care team members, and avoiding conflicts of interest.

VI.F. Systems-based Practice

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.