Pulmonary Disease Blueprint

Certification Examination (CERT)

Purpose of the exam

The exam is designed to evaluate the knowledge, diagnostic reasoning, and clinical judgment skills expected of the certified pulmonologist in the broad domain of the discipline. The ability to make appropriate diagnostic and management decisions that have important consequences for patients will be assessed. The exam may require recognition of common as well as rare clinical problems for which patients may consult a certified pulmonologist.

Exam content

Exam content is determined by a pre-established blueprint, or table of specifications. The blueprint is developed by ABIM and is reviewed annually and updated as needed for currency. Trainees, training program directors, and certified practitioners in the discipline are surveyed periodically to provide feedback and inform the blueprinting process.

The primary medical content categories of the blueprint are shown below, with the percentage assigned to each for a typical exam:

Medical Content Category	% of Exam
Obstructive Lung Disease	17.5%
Critical Care Medicine	15%
Diffuse Parenchymal Lung Disease (DPLD)	10%
Sleep Medicine, Neuromuscular and Skeletal	10%
Epidemiology	2%
Infections	12%
Neoplasia	9.5%
Pleural Disease	5%
Quality, Safety, and Complications	5%
Transplantation	2%
Vascular Diseases	6%
Respiratory Physiology and Pulmonary Symptoms	4%
Occupational and Environmental Diseases	2%
	100%

Exam questions in the content areas above may also address clinical topics in general internal medicine that are relevant to the practice of pulmonary medicine.

ABIM is committed to working toward health equity and believes that board-certified physicians should have an understanding of health care disparities. Therefore, health equity content that is clinically important to each discipline will be included in assessments, and the use of gender, race, and ethnicity identifiers will be re-evaluated.

Exam format

The exam is composed of up to 240 single-best-answer multiple-choice questions, of which approximately 40 are new questions that do not count in the examinee's score. Most questions describe patient scenarios and ask about the work done (that is, tasks performed) by physicians in the course of practice:

- Making a diagnosis
- Ordering and interpreting results of tests
- Recommending treatment or other patient care
- Assessing risk, determining prognosis, and applying principles from epidemiologic studies
- Understanding the underlying pathophysiology of disease and basic science knowledge applicable to patient care

Clinical information presented may include patient photographs, radiographs, electrocardiograms, recordings of heart or lung sounds, video, and other media to illustrate relevant patient findings. It is possible to enlarge ("zoom") most radiographic and histologic images. Learn more information on how exams are developed.

A tutorial including examples of ABIM exam question format can be found at http://www.abim.org/certification/exam-information/pulmonary-disease/exam-tutorial.aspx.

The blueprint can be expanded for additional detail as shown below. Each of the medical content categories is listed there, and below each major category are the content subsections and specific topics that *may* appear in the exam. Please note: actual exam content may vary.

Obstructive Lung Disease — **17.5%** of Exam

Asthma — 9%

- Pathophysiology and diagnosis of asthma
  - Genetics
  - Epidemiology
  - Biology
  - Evaluation (bronchodilator responses and provocative challenge)
- Severity and stepped care
  - Mild to moderate
  - Severe
  - Asthma in pregnancy
  - Perioperative care
  - Complications of care
- Special types and phenotypes of asthma
  - Aspirin-sensitive asthma
  - Exercise-induced asthma
  - Eosinophilic TH2-high asthma
  - Cough variant asthma and other special types
- Asthma mimics
  - Paradoxical vocal fold motion (Inducible laryngeal obstruction)
  - Genetic (cystic fibrosis, alpha-1 antitrypsin disease, primary ciliary dyskinesia) and nongenetic
  - Hypereosinophilic Löffler syndrome and other parasitic infections
  - Infiltrative airway processes (granulomatous, amyloidosis, and other processes)
  - Heart failure
  - Central airway obstruction
- Exacerbation
  - Status asthmaticus
  - Viral infections, allergens, and other causes
- Allergic bronchopulmonary aspergillosis and fungosis
- Eosinophilic granulomatosis with polyangiitis

Chronic obstructive pulmonary disease (COPD) — 6.5%

- Pathophysiology and diagnosis of COPD
  - Genetics
  - Epidemiology

- Biology
- Evaluation (guidelines, physiology of airflow, and imaging)

Management of chronic stable disease
- Pharmaceutical therapies
- Nonpharmaceutical therapies (rehabilitation, oxygen, palliation, and other therapies)
- Operative and bronchoscopic procedures
- Preoperative assessment and perioperative management
- Comorbidities (vascular disease, lung cancer, and other conditions)

Exacerbation of COPD
- Pharmaceutical therapies
- Nonpharmaceutical therapies (noninvasive positive-pressure ventilation [NIPPV] and mucociliary clearance)
- Prevention of exacerbations
- Mimics (heart failure and pulmonary embolism)

Obstructive, other than asthma and COPD 2%

Cystic fibrosis (CF)
- Pathophysiology
- Airway clearance

Non-CF bronchiectasis and issues other than infection

Central airway obstruction

Critical Care Medicine — **15%** of Exam

Assessment and monitoring 2%

Outcomes prediction including prognostic scoring systems

Assessment for agitation, cognitive impairment, and delirium

Cardiovascular assessment and monitoring

Critical care ultrasound

Determination of brain death

Therapeutics 4%

Airway management in respiratory failure

Assisted ventilation
- Invasive mechanical ventilation
- Noninvasive mechanical ventilation
- Extracorporeal membrane oxygenation and CO_2 removal

- Sedation, analgesia, and neuromuscular blockade
- Blood component replacement
- Enteral and parenteral nutrition (including feeding tubes)
- Early mobilization and rehabilitation
- Cardiopulmonary resuscitation and brain protective strategies
- Indications for renal replacement therapy
- Management of potential organ donors

Prevention and management of complications 2.5%

- Catheter-associated complications
- Ventilator-associated complications
- Acquired coagulation disorders
- Acquired gastroduodenal stress ulcers, ileus, and diarrhea
- Aspiration
- Acquired neuromuscular weakness

Nonrespiratory critical care 2.5%

- Shock
  - Septic shock
  - Cardiogenic shock
  - Hypovolemic and distributive shock
    - Hypovolemic shock
    - Anaphylaxis and drug-induced shock
    - Hemorrhagic shock (non-pulmonary hemorrhage)
- Cardiovascular critical care
  - Acute coronary syndromes
  - Acute heart failure
  - Tachyarrhythmias and bradyarrhythmias
  - Hypertensive and other vascular emergencies
- Neurologic critical care
- Acute liver failure and other acute abdominal processes
- Acute renal failure
- Severe, acute endocrine and metabolic disorders
- Coagulopathies
- Hypothermia and hyperthermia
- Toxicology

Respiratory Failure 4%

- Acute respiratory distress syndrome
- Other hypoxemic respiratory failure (e.g., e-cigarette and vaping-associated lung injury

Respiratory failure complicating airway obstruction
Asthma
COPD
Central airway obstruction
Hypercapnic respiratory failure
Massive hemoptysis and diffuse alveolar hemorrhage
Respiratory failure related to COVID-19

Diffuse Parenchymal Lung Disease (DPLD) — **10%** of Exam

Interstitial lung disease (ILD) associated with systemic inflammatory disease 2.5%
Connective tissue disease (CTD)–associated ILD
Rheumatoid arthritis
Systemic sclerosis
Polymyositis, dermatomyositis, and anti-synthetase syndromes
Sjogren syndrome
Systemic lupus erythematosus
Other connective tissue diseases
Inflammatory bowel disease–associated ILD
IgG4-related disease and other diseases

Idiopathic interstitial pneumonias 3.5%
Acute interstitial pneumonia
Cryptogenic organizing pneumonia
Desquamative interstitial pneumonia
Idiopathic pulmonary fibrosis
Lymphocytic interstitial pneumonia (LIP)
Nonspecific interstitial pneumonia
Respiratory bronchiolitis–associated ILD
Acute and chronic eosinophilic pneumonias
Idiopathic pleuropulmonary fibroelastosis and other conditions

Granulomatous interstitial lung diseases 2%
Sarcoidosis
Pulmonary
Extrapulmonary
Hypersensitivity pneumonitis
Granulomatous lymphocytic ILD and other conditions

Diffuse cystic lung diseases (DCLDs) <2%

- Lymphangioleiomyomatosis
- Langerhans cell histiocytosis
- Birt-Hogg-Dube syndrome
- Follicular bronchiolitis and cystic LIP
- Light-chain deposition disease, neurofibromatosis, Marfan syndrome, and other DCLDs

Radiation induced pneumonitis and fibrosis <2%

Drug-induced interstitial lung disease

Pulmonary alveolar proteinosis

Constrictive bronchiolitis (idiopathic and toxic exposure-induced)

Genetic and other rare interstitial lung diseases

Sleep Medicine, Neuromuscular and Skeletal — **10%** of Exam

Sleep, Respiratory 6.5%

- Central sleep apnea
  - Altitude
  - Cheyne-Stokes breathing
  - Other sleep, respiratory topics (idiopathic, pathophysiology)
  - Evaluation
- Normal Physiology, sleep and respiration
- Obstructive sleep apnea
  - Pathophysiology
  - Evaluation
  - Therapy
  - Outcomes
- Procedures
  - Polysomnography
  - Home sleep apnea testing
  - Multiple Sleep Latency Test (MSLT) and Maintenance of Wakefulness Test (MWT)

Sleep, Nonrespiratory <2%

- Insomnia
- Narcolepsy
- Periodic limb movement disorder
- Restless legs syndrome
- Interactions of cardiopulmonary disease and sleep

Hypoventilation 2.5%

- Chest wall and skeletal
- Obesity
- Neuromuscular disease
- Ventilatory control

Epidemiology — **2%** of Exam

Interpretation of clinical studies <2%

- Study design
- Causal inference
- Sources of error
- Analytic issues
- Screening studies
- Diagnostic studies

Pandemic response <2%

Infections — **12%** of Exam

Host defense mechanisms <2%

- Nonimmune mechanisms
- Innate immunity
- Adaptive immunity

Vaccination <2%

- Pneumococcus and other bacteria (HIB, Pertussis)
- Influenza and other respiratory viruses

Common syndromes of pulmonary infection 4%

- Upper respiratory tract infections
- Acute bronchitis
- Community-acquired pneumonia
- Aspiration, lung abscess, and anaerobic infections
- Empyema
- Nosocomial pneumonia (hospital-acquired pneumonia [HAP], healthcare-acquired pneumonia [HCAP], ventilator-associated pneumonia [VAP])
- Bronchiectasis
  - CF-related
  - Non-CF-related
- Mediastinitis

The Immunocompromised Host <2%

- Chemotherapy-related, post-transplantation, and drug-induced
- HIV and AIDS
- Congenital and acquired immune system disorders

Major pathogens in pulmonary infection 5%

- Pneumonia due to gram-positive bacteria
  - Pneumococcus
  - *Staphylococcus aureus*, including methicillin-resistant *S. aureus* (MRSA) and community-associated MRSA (CA-MRSA)
  - Other gram-positive bacteria (*Nocardia*, enterococci)
- Pneumonia due to gram-negative bacteria
  - *Pseudomonas*
  - Enterobacteriaceae
  - Other gram-negative bacteria (*Burkholderia, Legionella*)
- Viruses
  - Influenza
  - COVID-19/SARS-CoV-2
  - Cytomegalovirus infection, herpes, and varicella
- *Aspergillus* and other opportunistic fungi (*Mucor*)
- Endemic fungoses (histoplasmosis, blastomycosis, coccidioidomycosis) and cryptococcosis
- Parasitic infections
- Tuberculosis (TB)
- Non-TB mycobacterial infection

Extrapulmonary Infections in the ICU <2%

Neoplasia — **9.5%** of Exam

Lung cancer 3%

- Non-small cell lung cancer
  - Diagnostic evaluation
  - Staging
    - TNM staging and noninvasive staging
    - Invasive mediastinal staging
  - Molecular markers
- Small cell lung cancer

- Treatments for lung cancer
  - Lung cancer requiring surgical treatment
  - Lung cancer requiring nonsurgical treatment (chemotherapy, radiation therapy, palliative therapy)

Other intrathoracic tumors 2%

- Other primary lung tumors
  - Carcinoid tumors
  - Hamartoma
  - Adenoid cystic carcinoma and other primary lung tumors
- Tumors of the mediastinum
  - Thymoma
  - Lymphoma
  - Other mediastinal tumors
- Plasmacytoma, sarcoma, and other thoracic tumors
- Metastatic disease

Malignant pleural disease <2%

- Mesothelioma
- Malignant pleural effusion or pleural metastasis

Complications <2%

- Paraneoplastic syndromes
- Superior vena cava syndrome

Pulmonary nodules <2%

- Solitary pulmonary nodule
- Multiple pulmonary nodules
- Mimics of pulmonary nodules and masses

Physiologic assessment for thoracic surgery <2%

Interventional pulmonary medicine and thoracic surgery <2%

- Bronchoscopy, EBUS, and other interventional airway procedures
- Palliative interventions
- Video-assisted thoracoscopy (VATS) and other surgery

Lung cancer screening <2%

Pleural Disease — **5%** of Exam

Structure and physiology <2%

- Fibrosis
- Calcification
- Thickening

- Fluid dynamics
- Trapped lung and lung entrapment

Pneumothorax <2%

- Primary spontaneous
- Secondary
  - Parenchymal disease-related
  - Iatrogenic
  - Traumatic
  - Catamenial, familial, and other types
- Outcomes

Effusions and pleural pathology 2%

- Transudative
  - Hemodynamic and oncotic
  - Hydrothorax
  - Urinothorax and other types
- Exudative
  - Infectious
  - Occupational
  - Noninfectious inflammatory
  - Hemorrhagic
  - Chylous
  - Drug-induced
  - Eosinophilic

Diagnostic and therapeutic procedures <2%

- Thoracentesis and pleuroscopy
- Chest tubes and tunneled pleural catheters

Quality, Safety, and Complications — **5%** of Exam

Methods of assessing quality, safety, and patient satisfaction <2%

- Benchmarking
- Adverse event reporting
- Patient satisfaction surveys
- Root cause analysis
- Failure mode and effects analysis

Methods for improving quality and safety <2%

Complications of medical care 2%

- Adverse drug effects and drug interactions
- Complications of bronchoscopy and pleural procedures
- Adverse outcomes of thoracic surgery
- Adverse effects of thoracic radiation therapy
- Complications of translaryngeal intubation and tracheostomy
- Infection control

Ethics and professionalism (advance directives, end of life, decision-making capacity, etc.) <2%

Transplantation — **2%** of Exam

Lung transplantation <2%

- Patient selection
- Complications of lung transplantation
- Transplantation outcomes

Pulmonary complications of transplantation other than lung <2%

- Infections
- Neoplastic complications
- Other complications of organ transplantation (graft-versus-host disease)

Vascular Diseases — **6%** of Exam

Pulmonary thromboembolic disease 2.5%

- Deep venous thrombosis
- Pulmonary thromboembolism
- Nonthrombotic pulmonary embolism
- Infectious thrombophlebitis

Pulmonary hypertension <2%

- Pulmonary arterial hypertension
- Chronic thromboembolic disease
- Other pulmonary hypertension related to heart or lung disease
- Right ventricular failure

Pulmonary vasculitis and capillaritis <2%

- Granulomatosis with polyangiitis
- Anti-glomerular basement membrane disease
- Microscopic polyangiitis and other pulmonary vasculitides

Pulmonary vascular malformations	<2%
Pulmonary arteriovenous malformation	
Hepatopulmonary syndrome	
Sickle cell disease	<2%

Respiratory Physiology and Pulmonary Symptoms — **4%** of Exam

Respiratory physiology	2%
Pulmonary mechanics	
Oxygenation	
Cardiovascular physiology	
Cardiopulmonary exercise testing	
Acid-base interpretation	
Hypercapnia and hypocapnia	
Pulmonary function testing	
Special situations	<2%
Pregnancy	
Obesity	
Neuromuscular disease	
Preoperative evaluation (nonthoracic surgery)	
Barometric pressure-related (high altitude, diving, and other special situations)	
Approach to pulmonary symptoms	<2%
Dyspnea	
Cough	
Chest pain	
Hemoptysis	

Occupational and Environmental Diseases — **2%** of Exam

Tobacco use treatment and smoking cessation
Occupational asthma and work-exacerbated asthma
Indoor and outdoor air pollution
Barometric- or thermal-related disorders
Pneumoconioses
- Asbestosis
- Berylliosis
- Coal-workers' pneumoconiosis

- Hard metal pneumoconiosis
- Silicosis

Toxic inhalations

- E-cigarette and vaping-associated lung injury
- Carbon monoxide
- Smoke inhalation
- Other toxic exposures (cobalt, dust, endotoxin, metal fume fever, organic agents)

Environmental cancer risk

January 2025