

## Pulmonary Disease

### Certification Examination Blueprint

#### 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.

### **Exam format**

The exam is composed of multiple-choice questions with a single best answer, predominantly describing patient scenarios. Questions 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.

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.

<b>Obstructive Lung Disease</b>	<b>17.5%</b> of Exam
<b>Asthma</b>	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	
Vocal cord dysfunction	
Genetic (cystic fibrosis, alpha-1 antitrypsin disease, primary ciliary dyskinesia), and nongenetic	
Hypereosinophilic Löffler's 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	
<b>Chronic obstructive pulmonary disease (COPD)</b>	<b>6.5%</b>
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 perioperative management (lung volume reduction, lung cancer, other 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)	
<b>Obstructive, other than asthma and COPD</b>	<b>2%</b>
Cystic fibrosis (CF)	
Pathophysiology	
Airway clearance	
Non-CF bronchiectasis and issues other than infection	
Central airway obstruction	

<b>Critical Care Medicine</b>	<b>15%</b> of Exam
<b>Assessment and monitoring</b>	<b>2%</b>
Outcomes prediction including prognostic scoring systems	
Assessment for agitation, cognitive impairment, and delirium	
Cardiovascular assessment and monitoring	
Critical care ultrasound	
Determination of brain death	
<b>Therapeutics</b>	<b>4%</b>
Airway management in respiratory failure	
Assisted ventilation	
Invasive mechanical ventilation	
Noninvasive mechanical ventilation	
Extracorporeal membrane oxygenation and CO <sub>2</sub> removal	
Weaning from mechanical ventilator support	
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	
<b>Prevention and management of complications</b>	<b>2.5%</b>
Catheter-associated complications	
Ventilator-associated complications	
Acquired coagulation disorders	
Acquired gastroduodenal stress ulcers, ileus, and diarrhea	
Aspiration	
Acquired neuromuscular weakness	
<b>Respiratory Failure</b>	<b>4%</b>

- Acute respiratory distress syndrome
- Other hypoxemic respiratory failure
- Respiratory failure complicating airway obstruction
  - Asthma
  - COPD
  - Central airway obstruction
- Hypercapnic respiratory failure
- Massive hemoptysis and diffuse alveolar hemorrhage

**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
  - Impairments of consciousness
- Acute liver failure and other acute abdominal processes
- Acute renal failure
- Severe, acute endocrine and metabolic disorders
- Coagulopathies
- Hypothermia and hyperthermia
- Toxicology

<b>Diffuse Parenchymal Lung Disease (DPLD)</b>	<b>10%</b> of Exam
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**Interstitial lung disease (ILD) associated with systemic inflammatory disease** 2.5%

- Connective tissue disease (CTD)–associated ILD
  - Rheumatoid arthritis
  - Systemic sclerosis
  - Polymyositis and dermatomyositis
  - Sjögren’s syndrome, psoriasis, systemic lupus erythematosus, and other CTDs

- Inflammatory bowel disease–associated ILD

IgG4-related disease and other diseases	
<b>Idiopathic interstitial pneumonias</b>	3.5%
Acute interstitial pneumonia	
Cryptogenic organizing pneumonia	
Desquamative interstitial pneumonia	
Idiopathic pulmonary fibrosis	
Diagnostic evaluation	
Therapeutic approach	
Lymphocytic interstitial pneumonia (LIP)	
Nonspecific interstitial pneumonia	
Respiratory bronchiolitis–associated ILD	
Acute and chronic eosinophilic pneumonias	
Idiopathic pleuropulmonary fibroelastosis and other conditions	
<b>Granulomatous interstitial lung diseases</b>	2%
Sarcoidosis	
Pulmonary	
Extrapulmonary	
Hypersensitivity pneumonitis	
Granulomatous lymphocytic ILD and other	
<b>Diffuse cystic lung diseases (DCLDs)</b>	<2%
Lymphangioliomyomatosis	
Langerhans cell histiocytosis	
Birt-Hogg-Dube syndrome	
Follicular bronchiolitis and cystic LIP	
Light-chain deposition disease, neurofibromatosis, Marfan syndrome, and other DCLDs	
<b>Radiation induced pneumonitis and fibrosis</b>	<2%
<b>Drug-induced interstitial lung disease</b>	
<b>Pulmonary alveolar proteinosis</b>	
<b>Constrictive bronchiolitis (idiopathic and toxic exposure-induced)</b>	
<b>Genetic and other rare interstitial lung diseases</b>	

<b>Sleep Medicine, Neuromuscular and Skeletal</b>	<b>10%</b> of Exam
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<b>Sleep, Respiratory</b>	6.5%
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- 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)

<b>Sleep, Nonrespiratory</b>	<2%
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- Narcolepsy
- Periodic limb movement disorder
- Restless legs syndrome
- Interactions of cardiopulmonary disease and sleep

<b>Hypoventilation</b>	2.5%
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- Chest wall and skeletal
- Obesity
- Neuromuscular disease
- Ventilatory control

<b>Epidemiology</b>	<b>2%</b> of Exam
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<b>Interpretation of clinical studies</b>	2%
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- Study design
- Causal inference
- Sources of error
- Analytic issues
- Screening studies
- Diagnostic studies

<b>Infections</b>	<b>12%</b> of Exam
<b>Host defense mechanisms</b>	<2%
Nonimmune mechanisms	
Innate immunity	
Adaptive immunity	
<b>Vaccination</b>	<2%
Pneumococcus and other bacteria (HIB, Pertussis)	
Influenza and other respiratory viruses	
<b>Common syndromes of pulmonary infection</b>	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	
<b>The Immunocompromised Host</b>	<2%
Chemotherapy-related, post-transplantation, and drug-induced	
HIV and AIDS	
Congenital and acquired immune system disorders	
<b>Major pathogens in pulmonary infection</b>	5%
Pneumonia due to gram-positive bacteria	
Pneumococcus	
<i>Staphylococcus aureus</i> , including methicillin-resistant <i>S. aureus</i> (MRSA) and community-associated MRSA (CA-MRSA)	
Other gram-positive bacteria ( <i>Nocardia</i> , enterococci)	
Pneumonia due to gram-negative bacteria	
<i>Pseudomonas</i>	
Enterobacteriaceae	
Other gram-negative bacteria ( <i>Burkholderia</i> , <i>Legionella</i> )	
Viruses	
Influenza	
Cytomegalovirus infection, herpes, and varicella	
<i>Aspergillus</i> and other opportunistic fungi ( <i>Mucor</i> )	



Endemic fungoses (histoplasmosis, blastomycosis, coccidioidomycosis) and cryptococcosis	
Parasitic infections	
Tuberculosis (TB)	
Non-TB mycobacterial infection	
<b>Extrapulmonary Infections in the ICU</b>	<b>&lt;2%</b>

<b>Neoplasia</b>	<b>9.5%</b> of Exam
<b>Lung cancer</b>	<b>3%</b>
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)	
<b>Other intrathoracic tumors</b>	<b>2%</b>
Other primary lung tumors	
Carcinoid tumors	
Hamartoma	
Adenoid cystic carcinoma and other primary lung tumors	
Tumors of the mediastinum	
Thymoma	
Lymphoma	
Plasmacytoma, sarcoma, and other thoracic tumors	
Metastatic disease	
<b>Malignant pleural disease</b>	<b>&lt;2%</b>
Mesothelioma	
Malignant pleural effusion or pleural metastasis	
<b>Complications</b>	<b>&lt;2%</b>
Paraneoplastic syndromes	
Superior vena cava syndrome	
<b>Pulmonary nodules</b>	<b>&lt;2%</b>
Solitary pulmonary nodule	
Multiple pulmonary nodules	
Mimics of pulmonary nodules and masses	

<b>Physiologic assessment for thoracic surgery</b>	<2%
<b>Interventional pulmonary medicine and thoracic surgery</b>	<2%
Bronchoscopy, EBUS, and other interventional airway procedures	
Palliative interventions	
Video-assisted thoracoscopy (VATS) and other surgery	
<b>Lung cancer screening</b>	<2%

<b>Pleural Disease</b>	<b>5%</b> of Exam
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<b>Structure and physiology</b>	<2%
Fibrosis	
Calcification	
Thickening	
Fluid dynamics	
Trapped lung and lung entrapment	
<b>Pneumothorax</b>	<2%
Primary spontaneous	
Secondary	
Parenchymal disease-related	
Iatrogenic	
Traumatic	
Catamenial, familial, and other types	
Outcomes	
<b>Effusions and pleural pathology</b>	2%
Transudative	
Hemodynamic and oncotic	
Hydrothorax	
Urinothorax and other types	
Exudative	
Infectious	
Occupational	
Noninfectious inflammatory	
Hemorrhagic	
Chylous	
Drug-induced	
Eosinophilic	
<b>Diagnostic and therapeutic procedures</b>	<2%
Thoracentesis and pleuroscopy	
Chest tubes and tunneled pleural catheters	

<b>Quality, Safety, and Complications</b>	<b>5%</b> of Exam
<b>Methods of assessing quality, safety, and patient satisfaction</b>	<2%
Benchmarking	
Adverse event reporting	
Patient satisfaction surveys	
Root cause analysis	
Failure mode and effects analysis	
<b>Methods for improving quality and safety</b>	<2%
<b>Disclosure of errors to patients and family members</b>	<2%
<b>Complications of medical care</b>	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	
<b>Ethics and professionalism</b>	<2%
<b>Transplantation</b>	<b>2%</b> of Exam
<b>Lung transplantation</b>	<2%
Patient selection	
Complications of lung transplantation	
Transplantation outcomes	
<b>Pulmonary complications of transplantation other than lung</b>	<2%
Infections	
Neoplastic complications	
Other complications of organ transplantation (graft-versus-host disease)	
<b>Vascular Diseases</b>	<b>6%</b> of Exam
<b>Pulmonary thromboembolic disease</b>	2.5%
Deep venous thrombosis	
Pulmonary thromboembolism	
Nonthrombotic pulmonary embolism	
Lemierre's syndrome	
<b>Pulmonary hypertension</b>	<2%
Pulmonary arterial hypertension	
Chronic thromboembolic disease	
Right ventricular failure	

Other pulmonary hypertension (veno-occlusive disease, portopulmonary hypertension)	
<b>Pulmonary vasculitis and capillaritis</b>	<2%
Granulomatosis with polyangiitis	
Anti-glomerular basement membrane disease	
Microscopic polyangiitis and other pulmonary vasculitides	
<b>Pulmonary vascular malformations</b>	<2%
Pulmonary arteriovenous malformation	
Hepatopulmonary syndrome	
<b>Sickle cell disease</b>	<2%

<b>Respiratory Physiology and Pulmonary Symptoms</b>	<b>4%</b> of Exam
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<b>Respiratory physiology</b>	2%
Pulmonary mechanics	
Oxygenation	
Cardiovascular physiology	
Cardiopulmonary exercise testing	
Acid-base interpretation	
Hypercapnia and hypocapnia	
Pulmonary function testing	
<b>Special situations</b>	<2%
Pregnancy	
Obesity	
Neuromuscular disease	
Preoperative evaluation (nonthoracic surgery)	
Barometric pressure-related (high altitude, diving, and other special situations)	
<b>Approach to pulmonary symptoms</b>	<2%
Dyspnea	
Cough	
Chest pain	
Hemoptysis	

<b>Occupational and Environmental Diseases</b>	<b>2%</b> of Exam
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- 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

**Work and disability evaluation****Toxic inhalations**

Carbon monoxide

Smoke inhalation

Other toxic exposures (cobalt, dust, endotoxin, metal fume fever, organic agents)

**Environmental cancer risk**

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