

## Critical Care Medicine

### 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 critical care medicine specialist 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 critical care medicine specialist.

#### Exam content

Exam content is determined by a pre-established blueprint, or table of specifications. The blueprint is developed by the 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
Renal, Endocrine, and Metabolic Disorders	15.0%
Cardiovascular Disorders	17.5%
Pulmonary Disease	20.0%
Infectious Disease	12.0%
Gastrointestinal Disorders	5.0%
Neurologic Disorders	9.5%
Hematologic and Oncologic Disorders	5.5%
Surgery, Trauma, and Transplantation	7.0%
Pharmacology and Toxicology	4.5%
Research, Administration, and Ethics	2.0%
Critical Care Ultrasound Scanning	2.0%
	100%

Exam questions in the content areas above may also address clinical topics in general internal medicine that are relevant to the practice of critical care medicine (including some general pediatrics with an emphasis on adolescent 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 various media illustrating relevant findings, such as diagnostic imaging studies. Some questions require interpretation of pictorial material, such as pressure tracings, ultrasound scans, magnetic resonance imaging scans, electrocardiograms, radiographs, computed tomograms, radionuclide scans, and photomicrographs.

A tutorial including examples of ABIM exam question format can be found at <http://www.abim.org/certification/exam-information/critical-care-medicine/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>Renal, Endocrine, and Metabolic Disorders</b>	<b>15%</b> of Exam
<b>Sodium-water balance</b>	2%
Hyponatremia	
Syndrome of inappropriate antidiuretic hormone secretion	
Cerebral salt wasting	
Psychogenic polydipsia	
Hypothyroidism	
Iatrogenic	
Exercise-induced	

Hypernatremia	
Central diabetes insipidus	
Nephrogenic diabetes insipidus	
Osmotic diuresis	
Primary hypodipsia	
Dehydration	
Gastrointestinal fluid losses	
Hypervolemia	
Hypovolemia	
<b>Potassium disorders</b>	<2%
Hyperkalemia	
Pseudohyperkalemia	
Drug-induced	
Adrenal insufficiency	
Hypokalemia	
Vomiting	
Diarrhea	
Renal losses	
Drug-induced	
<b>Acid-base disorders</b>	4.5%
Metabolic acidosis	
Increased anion gap	
Lactic acidosis	
Ketoacidosis	
Hypoalbuminemia	
Normal anion gap	
Diarrhea	
Saline resuscitation-associated	
Drug-induced	
Decreased anion gap in multiple myeloma	
Metabolic alkalosis	
Diuretic-induced (contraction alkalosis)	
Other metabolic alkalosis topics (parenteral	
...nutrition–induced, complications of citrate anticoagulation)	
Mixed acid-base disorders	
Respiratory acidosis	
Respiratory alkalosis	
<b>Toxic ingestions</b>	<2%
High osmolar gap	
Ethanol	
Methanol	

Isopropyl alcohol	
Ethylene glycol	
Propylene glycol	
Normal osmolar gap	
Salicylates	
<b>Calcium, phosphate, and magnesium disorders</b>	<2%
Hyperphosphatemia	
Hypophosphatemia	
Hypercalcemia	
Hypocalcemia	
Hypermagnesemia	
Hypomagnesemia	
<b>Hyperammonemia</b>	<2%
<b>Diabetes mellitus (excluding diabetic ketoacidosis) and energy metabolism</b>	<2%
Hyperglycemic hyperosmolar state	
Hyperglycemia	
Hypoglycemia	
<b>Thyroid disorders</b>	<2%
Hypothyroidism	
Hyperthyroidism	
Euthyroid sick syndrome	
<b>Parathyroid disorders</b>	<2%
<b>Adrenal disorders</b>	<2%
Adrenal insufficiency	
Relative adrenal insufficiency in critical illness	
Adrenal excess	
Addison's Disease	
<b>Pituitary disorders</b>	<2%
<b>Tumor-related syndromes</b>	<2%
<b>Acute renal failure</b>	2%
Contrast-induced	
Pigment-induced	
Oncology-related	
Pre-renal disease	
Intrinsic disease	
Glomerulonephritis	
Interstitial nephritis	
Rhabdomyolysis	
Acute tubular necrosis	
Renal replacement therapy	

**Cardiovascular Disorders****17.5%** of Exam**Acute coronary syndromes**

&lt;2%

Unstable angina pectoris and non-ST-segment elevation  
myocardial infarction (NSTEMI)

Unstable angina pectoris  
NSTEMI

ST-segment elevation myocardial infarction (STEMI)

Diagnosis

Complications

Heart failure, cardiogenic shock

Ventricular septal defect

Acute mitral regurgitation

Ventricular wall rupture

Electrical conduction abnormalities

Right ventricular failure

Arrhythmias

Management of STEMI

Cocaine-related ischemia

**Arrhythmias**

&lt;2%

Supraventricular tachycardia

Atrial fibrillation

Atrial flutter

Multifocal atrial tachycardia

Pre-excitation syndromes

Paroxysmal supraventricular tachycardia

(atrioventricular [AV] nodal reentrant tachycardia)

Ventricular arrhythmias

Nonsustained ventricular tachycardia

Monomorphic ventricular tachycardia

Polymorphic ventricular tachycardia

Ventricular fibrillation

Accelerated idioventricular rhythm

Long QT syndrome

Brugada syndrome

Bradycardias

Sinus bradycardia

Sinoatrial exit block

Atrioventricular block

Pacemakers and defibrillators

<b>Heart failure</b>	3.5%
Heart failure with reduced ejection fraction (HFrEF)	
Heart failure with preserved ejection fraction (HFpEF)	
<b>Hemodynamic monitoring</b>	5.5%
Interpretation of arterial catheterization	
Pulmonary arterial catheterization	
Central venous catheterization	
Non-invasive hemodynamic monitoring	
<b>Vascular disorders</b>	<2%
Aortic dissection and aneurysm	
Aortic dissection	
Aortic aneurysm and transection	
Shock	
Hypertensive emergency and urgency	
<b>Valvular heart disease</b>	<2%
Mitral stenosis	
Aortic stenosis	
Aortic regurgitation	
Mitral regurgitation	
Endocarditis	
Structural defects	
Atrial	
Ventricular	
<b>Pericardial disease</b>	<2%
Pericarditis	
Cardiac tamponade	
<b>Myocardial disease</b>	<2%
Myocarditis	
Hypertrophic cardiomyopathy	
Peripartum cardiomyopathy	
Stress cardiomyopathy	
<b>Mechanical circulatory support</b>	<2%
Intraaortic balloon pump (IABP) counterpulsation	
Extracorporeal membrane oxygenation (ECMO)	
Ventricular assist devices (VADs)	
<b>Transplanted heart</b>	<2%

<b>Pulmonary Disease</b>	<b>20%</b> of Exam
<b>Respiratory failure</b>	2%
Hypoxemic	
Hypercapnic	
<b>Mechanical ventilation</b>	6%
Initiation and maintenance of mechanical ventilation	
Endotracheal intubation and tracheostomy	
Modes	
Oxygenation	
Ventilation (CO <sub>2</sub> )	
Waveforms	
Respiratory system compliance (lung mechanics)	
Complications of mechanical ventilation	
Barotrauma	
Bronchopleural fistula	
Ventilator-induced lung injury	
Dynamic hyperinflation (auto-PEEP)	
Intracardiac shunt	
Complications of endotracheal tubes and tracheostomy	
Liberation from mechanical ventilation	
Noninvasive ventilation	
<b>Airway disease</b>	2%
Upper airway disease	
Upper airway obstruction	
Tracheoesophageal fistula	
Intubation-related laryngeal edema	
Anaphylactic airway edema and increased negative inspiratory pressure	
Airway control	
Asthma	
Chronic obstructive pulmonary disease (COPD)	
<b>Parenchymal lung disease</b>	5%
Acute respiratory distress syndrome (ARDS)	
Pneumonia	
Community-acquired pneumonia (CAP)	
Typical bacterial	
Atypical bacterial	
Aspiration	
Viral	
Fungal	

Hospital-acquired pneumonias and immunocompromised hosts	
Ventilator-associated pneumonia (VAP)	
Hematogenous pneumonia	
<i>Aspergillus</i> pneumonia	
Non- <i>Aspergillus</i> pneumonia	
<i>Pneumocystis jirovecii</i> pneumonia	
Viral pneumonia	
Pulmonary edema	
Neurogenic	
Tocolytic	
Negative-pressure	
High-altitude	
Hypersensitivity pneumonitis	
Diffuse alveolar hemorrhage	
Atelectasis	
<b>Pulmonary vascular disorders</b>	2%
Pulmonary thromboembolism	
Deep venous thrombosis (DVT)	
Pulmonary embolism (PE)	
Nonthrombotic embolism	
Air	
Tumor	
Septic	
Pulmonary hypertension	
Acute chest syndrome in sickle cell disease	
Pulmonary vasculitis	
Hepatopulmonary syndrome	
<b>Hemoptysis</b>	<2%
Massive	
Submassive	
<b>Pleural disorders</b>	2%
Pleural effusion	
Infectious (empyema)	
Noninfectious	
Pneumothorax	
Hemothorax	



**Infectious Disease****12%** of Exam**Systemic infections**

&lt;2%

- Sepsis and septic shock
- Bacterial infections (typical and atypical)
  - Tuberculosis
  - Atypical mycobacterial infections
  - Nocardiosis
  - Listeriosis
  - Brucellosis
  - Typhoid fever
  - Tularemia
  - Plague
  - Rickettsial or Rickettsial-like infections
    - Rocky Mountain spotted fever
    - Ehrlichiosis/Anaplasmosis
  - Spirochetal infections
    - Lyme disease
    - Leptospirosis
- Fungal infections
- Viral infections
- Parasitic diseases
  - Malaria
  - Babesiosis
  - Strongyloides* hyperinfection syndrome
  - Giardiasis

**Central nervous system infections**

&lt;2%

- Meningitis
  - Bacterial
    - Meningococcal
    - Pneumococcal
    - Syphilitic
    - Listerial
  - Fungal
  - Mycobacterial
- Encephalitis
  - Viral
    - Herpes simplex virus
    - West Nile virus
    - Rabies
  - Parasitic

Brain abscess	
Epidural abscess	
<b>Head, neck, and upper airway infections</b>	<2%
Eye and orbit	
Septic cavernous sinus thrombosis	
Soft tissue infections of the head and neck	
Sinusitis	
Epiglottitis	
<b>Cardiovascular infections</b>	<2%
Pericarditis	
Endocarditis	
Device-related infections	
Catheter-related infections (peripheral, central venous, arterial, pulmonary artery)	
<b>Gastrointestinal and intra-abdominal infections</b>	<2%
Esophageal	
Liver	
Gallbladder and biliary	
Pancreatitis	
Necrotizing (infected)	
Pancreatic abscess	
Gastroenteritis	
Community-acquired bacterial	
Colitis and diverticulitis	
<i>Clostridioides (Clostridium) difficile</i> –associated	
Parasitic	
Necrotizing enterocolitis (typhlitis)	
Cytomegalovirus colitis	
Peritonitis	
Small intestine and appendix	
<b>Genitourinary tract infections</b>	<2%
Cystitis, including catheter-related	
Pyelonephritis	
Perinephric abscess	
<b>Soft tissue, bone, and joint infections</b>	<2%
Bites	
Septic arthritis	
<b>Infections associated with nonvascular transcutaneous catheters</b>	<2%

<b>Antimicrobial therapy and resistance</b>	<2%
Nonallergic toxicity	
Allergic reactions	
Resistant organisms	
Gram-positive organisms	
Gram-negative organisms	
Fungi and inherent susceptibility patterns and resistance	
<b>Pharmacokinetics</b>	<2%
<b>Infections in immunocompromised hosts</b>	<2%
Opportunistic infections in human immunodeficiency virus (HIV) infection	
Neutropenia	
Transplantation	
Solid organ	
Hematopoietic cell	
Asplenia	
Corticosteroid immunosuppression	
<b>Virulence factors</b>	<2%
Toxic shock	
<b>Bioterrorism</b>	<2%
<b>Hospital infection control</b>	<2%

<b>Gastrointestinal Disorders</b>	<b>5.0%</b> of Exam
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<b>Esophagus</b>	<2%
Corrosive injury	
Perforation and rupture	
Fistula	
<b>Stomach</b>	<2%
Peptic ulcer disease	
Non-peptic ulcer disease	
Perforation	
Mechanical disorders	
<b>Small intestine</b>	<2%
Perforation	
Hemorrhage	
Mechanical and motility disorders	
Inflammatory bowel diseases	

<b>Large intestine</b>	<2%
Perforation	
Hemorrhage	
Mechanical and motility disorders	
Colonic ischemia	
<b>Liver</b>	<2%
Hepatitis	
Viral	
Autoimmune	
Alcohol- and drug-induced	
Toxin and solvent exposure	
Ischemic (shock liver)	
Budd-Chiari syndrome	
Portal hypertension	
Esophageal variceal hemorrhage	
Gastric variceal hemorrhage	
Spontaneous bacterial peritonitis	
Hepatorenal syndrome	
Hepatopulmonary syndrome	
Portopulmonary hypertension	
Fulminant hepatic failure	
Infection	
Alcohol- and drug-induced	
Tumor	
Infiltrative diseases and nonalcoholic steatohepatitis (NASH)	
Toxin exposure	
Encephalopathy	
Cerebral edema	
Hypotension	
<b>Pancreas</b>	<2%
Pancreatitis	
Infectious	
Gallbladder disease	
Tumor	
Alcohol- and drug-induced	
Toxin exposure	
Hypertriglyceridemia-induced	
Complications	

<b>Gallbladder and biliary tract</b>	<2%
Cholecystitis, calculous and acalculous	
Cholangitis	

<b>Neurologic Disorders</b>	<b>9.5%</b> of Exam
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<b>Brain death</b>	
(also see entry in Research, Ethics, and Administration)	<2%
<b>Cerebrovascular disease</b>	2.5%
Ischemic stroke	
Intracerebral hemorrhage	
Subarachnoid hemorrhage and aneurysm	
Complications	
Vasospasm	
Other subarachnoid hemorrhage and aneurysm	
topics (hydrocephalus)	
Cerebral vein and sinus thrombosis	
<b>Seizures and status epilepticus</b>	<2%
Seizures complicating critical illness	
Seizures caused by critical illness	
Pre-existing epilepsy in critically ill patients	
Status epilepticus	
Generalized convulsive status epilepticus	
Nonconvulsive status epilepticus	
Electroencephalogram (EEG) monitoring in the	
intensive care unit (ICU)	
Repetitive seizures	
<b>Neurogenic pulmonary edema</b>	<2%
<b>Neuromuscular respiratory failure</b>	<2%
Guillain-Barré syndrome	
Critical illness myopathy	
Critical illness polyneuropathy	
Tetanus	
Myasthenia gravis	
Botulism	
<b>Increased intracranial pressure</b>	<2%
<b>Head trauma</b>	<2%
Nonpenetrating head trauma	
Penetrating head trauma	

<b>Spinal cord injury</b>	<2%
Cervical spine injury	
Thoracic spine injury	
<b>Coma, encephalopathy, and delirium</b>	<2%
Anoxic brain injury	
Metabolic encephalopathy	
Drug-induced encephalopathy	
Drug and alcohol withdrawal	
ICU-related delirium	
Targeted temperature management	
<b>Analgesia, sedation, and neuromuscular junction blockade</b>	2%
Analgesia	
Sedation	
Neuromuscular junction blockade	

<b>Hematologic and Oncologic Disorders</b>	<b>5.5%</b> of Exam
<b>Red blood cell diseases</b>	<2%
Anemias	
Polycythemias	
Hemoglobinopathies	
<b>White blood cell diseases</b>	<2%
Leukopenia (immune, drug-related)	
Leukemias	
Lymphoma	
Multiple myeloma	
<b>Platelet disorders</b>	<2%
Thrombocytosis	
Thrombocytopenia	
Platelet dysfunction	
<b>Coagulopathies</b>	<2%
Disseminated intravascular coagulation (DIC)	
Factor deficiencies	
Antithrombotic agents and reversal of coagulopathy	
Hypothermia	
Hemorrhagic shock	
<b>Hypercoagulable states</b>	<2%
Proteins C and S, and antithrombin deficiency	
Factor V Leiden mutation	
Malignancy	
Hormone replacement therapy and oral contraceptives	

Antiphospholipid antibody syndrome	
<b>Transfusion medicine</b>	<2%
Blood products	
Apheresis	
Adverse effects	
Massive blood transfusion	
Transfusion refusal	
<b>Solid tumors</b>	<2%
<b>Oncologic syndromes</b>	<2%
Superior vena cava syndrome	
Tumor lysis syndrome	
Spinal cord compression	
Hyperviscosity syndrome	
Hypercalcemia	
<b>Hematopoietic cell transplantation</b>	<2%
Graft-versus-host disease	
Hepatic sinusoidal obstruction syndrome (veno-occlusive disease)	
Respiratory distress	
<b>Complications of immunosuppressive drugs and chemotherapy</b>	<2%
Cyclosporine	
Corticosteroids	
Alkylating agents	
Methotrexate	
Sirolimus	
Tacrolimus	
Mycophenolate mofetil	
Azathioprine	

<b>Surgery, Trauma, and Transplantation</b>	<b>7.0 % of Exam</b>
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<b>Cardiovascular and vascular surgery</b>	<2%
Cardiac	
Mediastinal disease	
Vascular, aortic and peripheral	
Thoracic	
<b>Abdominal and gastrointestinal</b>	<2%
Acute abdomen	
Postoperative complications	
Mesenteric ischemia and ischemic colitis	
Abdominal compartment syndrome	

<b>Genitourinary and obstetric emergencies</b>	<2%
Urologic	
Obstetric	
<b>Skin and soft tissues and extremities</b>	<2%
Soft tissue infections	
Crush injury, myonecrosis, and rhabdomyolysis	
Necrotizing fasciitis	
Acute compartment syndrome	
<b>Environmental injury</b>	3.5%
Inhalation injury	
Hypothermia	
Submersion injury, near-drowning, and diving trauma	
Altitude injury	
Electrical injury and lightning strike	
Radiation injury	
Bioterrorism, noninfectious	
Heatstroke	
Burn injury	
<b>General postoperative management</b>	<2%
<b>Trauma</b>	<2%
Flail chest	
Pulmonary contusion	
Hemothorax	
Great vessel injury	
Airway injury, tracheobronchial laceration and rupture	
Foreign body aspiration	
Blunt myocardial injury	
Fat embolism syndrome	
Intra-abdominal injury	
Massive bleeding	
Shock	
<b>Transplantation</b>	<2%
Heart	
Lung	
Liver	
Kidney	
Pancreas and intestines	
Organ donation	



<b>Pharmacology and Toxicology</b>	<b>4.5%</b> of Exam
<b>Basic pharmacologic principles</b>	<2%
Pharmacokinetics	
Dosing adjustments for disease states	
<b>Drug-drug interactions</b>	<2%
<b>Adverse effects of drugs</b>	<2%
Immunologic allergic reactions	
Anaphylaxis	
Thrombotic thrombocytopenic purpura	
Stevens-Johnson syndrome	
Nonimmunologic adverse effects of drugs	
Electrolyte and metabolic	
Hyperthermia	
Neurologic	
Renal	
Hematologic	
Cardiac	
<b>Toxicology, drug overdose, and poisoning</b>	<2%
Acetaminophen	
Beta-adrenergic blockers	
Calcium channel blockers	
Cyanide	
Tricyclic antidepressants	
Nitroprusside	
Oral antihyperglycemic agents	
Organophosphates	
Salicylates	
Sarin (nerve) gas	
Selective serotonin reuptake inhibitors (SSRIs)	
Additional psychotropic drugs	
Scombroid food poisoning	
Muscle relaxants	
Xanthines	
Iron toxicity	
Antibiotic toxicity	
Carbon monoxide	
Methemoglobinemia	

<b>Research, Administration, and Ethics</b>	<b>2.0%</b> of Exam
<b>Intensive care unit (ICU) administration</b>	<2%
Regulatory issues	
Intensive care unit (ICU) physical design	
Continuous quality improvement and patient safety	
Isolation	
<b>Staffing issues</b>	<2%
Physician extenders in the intensive care unit (ICU)	
Interactions between hospitalists and intensivists	
<b>Medicolegal interactions</b>	<2%
<b>Ethical considerations</b>	<2%
Patient autonomy	
Legal surrogates	
Informed consent for medical procedures	
<b>Brain death</b> (also see entry in Neurologic Disorders)	<2%
<b>Conflict of interest</b>	<2%
<b>Advance directives</b>	<2%
<b>Patient confidentiality and Health Insurance Portability and Accountability Act (HIPAA) regulations</b>	<2%
<b>End-of-life issues</b>	<2%
<b>Organ donation</b>	<2%
<b>Medical futility</b>	<2%
<b>Medical research</b>	<2%
Clinical trial design	
Statistical analysis	
Institutional review boards	
<b>Teaching and education</b>	<2%
Teaching formats	
<b>Psychosocial issues</b>	<2%
Professionalism	
Intensive care unit (ICU) burnout	
Impaired health-care professional	

<b>Critical Care Ultrasound Scanning</b>	<b>2.0%</b> of Exam
<b>Cardiac</b>	<2%
<b>Pulmonary</b>	<2%
<b>Abdominal</b>	<2%
<b>Neurologic</b>	<2%
<b>Vascular</b>	<2%