

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.

| | |
|--|--------------------|
| Renal, Endocrine, and Metabolic Disorders | 15% of Exam |
| Sodium-water balance | 2% |
| Hyponatremia | |
| Syndrome of inappropriate antidiuretic hormone secretion | |
| Cerebral salt wasting | |
| Psychogenic polydipsia | |
| Hypothyroidism | |
| Iatrogenic | |
| Exercise-induced | |

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| Hypernatremia | |
| Central diabetes insipidus | |
| Nephrogenic diabetes insipidus | |
| Osmotic diuresis | |
| Primary hypodipsia | |
| Dehydration | |
| Gastrointestinal fluid losses | |
| Hypervolemia | |
| Hypovolemia | |
| Potassium disorders | <2% |
| Hyperkalemia | |
| Pseudohyperkalemia | |
| Drug-induced | |
| Adrenal insufficiency | |
| Renal tubular acidosis | |
| Hypokalemia | |
| Vomiting | |
| Diarrhea | |
| Renal losses | |
| Drug-induced | |
| Renal tubular acidosis | |
| Acid-base disorders | 4.5% |
| Metabolic acidosis | |
| Increased anion gap | |
| Lactic acidosis | |
| Ketoacidosis | |
| Hypoalbuminemia | |
| Normal anion gap | |
| Diarrhea | |
| Saline resuscitation-associated | |
| Drug-induced | |
| Renal tubular acidosis | |
| 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 | |

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|--|-----|
| Toxic ingestions | <2% |
| High osmolar gap | |
| Ethanol | |
| Methanol | |
| Isopropyl alcohol | |
| Ethylene glycol | |
| Propylene glycol | |
| Normal osmolar gap | |
| Salicylates | |
| Calcium, phosphate, and magnesium disorders | <2% |
| Hyperphosphatemia | |
| Hypophosphatemia | |
| Hypercalcemia | |
| Hypocalcemia | |
| Hypermagnesemia | |
| Hypomagnesemia | |
| Hyperammonemia | <2% |
| Diabetes mellitus (excluding diabetic ketoacidosis) and energy metabolism | <2% |
| Hyperglycemic hyperosmolar state | |
| Hyperglycemia | |
| Hypoglycemia | |
| Thyroid disorders | <2% |
| Hypothyroidism | |
| Hyperthyroidism | |
| Euthyroid sick syndrome | |
| Parathyroid disorders | <2% |
| Adrenal disorders | <2% |
| Adrenal insufficiency | |
| Relative adrenal insufficiency in critical illness | |
| Adrenal excess | |
| Pituitary disorders | <2% |
| Tumor-related syndromes | <2% |
| Pheochromocytoma | |
| Carcinoid | |
| Acute renal failure | 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

<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

<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

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

| Pulmonary Disease | 20% of Exam |
|---|--------------------|
| Respiratory failure | 2% |
| Hypoxemic | |
| Hypercapnic | |
| Mechanical ventilation | 6% |
| Initiation and maintenance of mechanical ventilation | |
| Endotracheal intubation and tracheostomy | |
| Modes | |
| Oxygenation | |
| Ventilation (CO ₂) | |
| 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 | |
| Airway disease | 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) | |
| Parenchymal lung disease | 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 jiroveci</i> pneumonia | |
| Viral pneumonia | |
| Tuberculosis | |
| Pulmonary edema | |
| Neurogenic | |
| Tocolytic | |
| Negative-pressure | |
| High-altitude | |
| Hypersensitivity pneumonitis | |
| Diffuse alveolar hemorrhage | |
| Atelectasis | |
| Pulmonary vascular disorders | 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 | |
| Hemoptysis | <2% |
| Massive | |
| Submassive | |
| Pleural disorders | 2% |
| Pleural effusion | |
| Infectious (empyema) | |
| Noninfectious | |
| Pneumothorax | |
| Hemothorax | |

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

<2%

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

Central nervous system infections

<2%

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

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

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

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

| | |
|--|-----|
| Large intestine | <2% |
| Perforation | |
| Hemorrhage | |
| Mechanical and motility disorders | |
| Colonic ischemia | |
| Liver | <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 | |
| Pancreas | <2% |
| Pancreatitis | |
| Infectious | |
| Gallbladder disease | |
| Tumor | |
| Alcohol- and drug-induced | |
| Toxin exposure | |
| Hypertriglyceridemia-induced | |
| Complications | |

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|---|-----|
| Gallbladder and biliary tract | <2% |
| Cholecystitis, calculous and acalculous | |
| Cholangitis | |

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|-----------------------------|---------------------|
| Neurologic Disorders | 9.5% of Exam |
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|--|------|
| Brain death | |
| (also see entry in Research, Ethics, and Administration) | <2% |
| Cerebrovascular disease | 2.5% |
| Ischemic stroke | |
| Intracerebral hemorrhage | |
| Subarachnoid hemorrhage and aneurysm | |
| Complications | |
| Vasospasm | |
| Other subarachnoid hemorrhage and aneurysm | |
| topics (hydrocephalus) | |
| Cerebral vein and sinus thrombosis | |
| Seizures and status epilepticus | <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 | |
| Neurogenic pulmonary edema | <2% |
| Neuromuscular respiratory failure | <2% |
| Guillain-Barré syndrome | |
| Critical illness myopathy | |
| Critical illness polyneuropathy | |
| Tetanus | |
| Myasthenia gravis | |
| Botulism | |
| Increased intracranial pressure | <2% |
| Head trauma | <2% |
| Nonpenetrating head trauma | |
| Penetrating head trauma | |

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

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

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

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

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|--|------|
| Genitourinary and obstetric emergencies | <2% |
| Urologic | |
| Obstetric | |
| Skin and soft tissues and extremities | <2% |
| Soft tissue infections | |
| Crush injury, myonecrosis, and rhabdomyolysis | |
| Necrotizing fasciitis | |
| Acute compartment syndrome | |
| Environmental injury | 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 | |
| General postoperative management | <2% |
| Trauma | <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 | |
| Transplantation | <2% |
| Heart | |
| Lung | |
| Liver | |
| Kidney | |
| Pancreas and intestines | |
| Organ donation | |

| Pharmacology and Toxicology | 4.5% of Exam |
|---|---------------------|
| Basic pharmacologic principles | <2% |
| Pharmacokinetics | |
| Dosing adjustments for disease states | |
| Drug-drug interactions | <2% |
| Adverse effects of drugs | <2% |
| Immunologic allergic reactions | |
| Anaphylaxis | |
| Thrombotic thrombocytopenic purpura | |
| Stevens-Johnson syndrome | |
| Nonimmunologic adverse effects of drugs | |
| Electrolyte and metabolic | |
| Hyperthermia | |
| Neurologic | |
| Renal | |
| Hematologic | |
| Cardiac | |
| Toxicology, drug overdose, and poisoning | <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 | |

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

| Critical Care Ultrasound Scanning | 2.0% of Exam |
|--|---------------------|
| Cardiac | <2% |
| Pulmonary | <2% |
| Abdominal | <2% |
| Neurologic | <2% |
| Vascular | <2% |