



Promoting patient safety by enhancing provider quality.

## **SEE Exam Content Outline**

*For SEE exams administered ON or AFTER 5/1/2018*

- I. Basic Sciences (25%)
  - A. Anatomy, physiology and pathophysiology
    1. Cardiovascular
      - a. Ischemic heart disease
      - b. Valvular heart disease
      - c. Congenital heart defects
      - d. Cardiac conduction and rhythm abnormalities
      - e. Cardiovascular and peripheral vascular complications
      - f. Infectious diseases
      - g. Pericardial diseases
      - h. Cardiomyopathy and heart failure
    2. Respiratory
      - a. Obstructive diseases
      - b. Restrictive diseases
      - c. Infectious diseases
      - d. Pulmonary vascular complications
      - e. Altered airway anatomy
      - f. Genetic respiratory disorders
    3. Central nervous system
      - a. Neurodegenerative diseases
      - b. Myelin diseases
      - c. Cerebrovascular diseases
      - d. Neuropathies and myopathies
      - e. Psychiatric disorders
      - f. Spinal cord disorders
      - g. Intracranial tumor
      - h. Congenital anomalies (e.g., cerebral palsy)
      - i. Seizure disorders
      - j. Genetic nervous system disorders
      - k. Intracranial hypertension
      - l. Thermoregulation
    4. Musculoskeletal
      - a. Myopathies/metabolic complications
      - b. Neuromuscular diseases
      - c. Skeletal diseases

- d. Musculoskeletal disorders
- e. Genetic musculoskeletal disorders
- 5. Endocrine
  - a. Thyroid and parathyroid disorders
  - b. Pituitary disorders
  - c. Adrenal disorders
  - d. Pancreatic disorders
  - e. Metabolic disorders
  - f. Genetic endocrine disorders
- 6. Hepatic
  - a. Infectious diseases
  - b. Biliary tract and bilirubin disorders
  - c. Cirrhotic disorders
  - d. Hepatovascular complications
- 7. Renal
  - a. Primary kidney diseases and disorders
  - b. Acute kidney injury
  - c. Chronic kidney injury
- 8. Hematologic
  - a. Anemias
  - b. Hemoglobin disorders
  - c. Coagulation disorders
  - d. Infectious diseases
- 9. Gastrointestinal
  - a. Esophageal disorders
  - b. Gastric disorders
  - c. Pancreatic disorders
  - d. Intestinal disorders
  - e. Tumors/secreting lesions
  - f. Malabsorption disorders
- 10. Immune
  - a. Infectious disorders
  - b. Hyper- and hypo-immune disorders (allergic response)
  - c. Autoimmune diseases
- 11. Other conditions
  - a. Cancer
  - b. Glaucoma
  - c. Burns
  - d. Trauma
  - e. Substance abuse (alcohol, tobacco, other)

- B. Pharmacology
  - 1. General principles
    - a. Pharmacodynamics
    - b. Pharmacokinetics
    - c. Drug interactions
  - 2. Inhalation anesthetics
  - 3. Intravenous agents
    - a. Barbiturates
    - b. Sedative/hypnotics
    - c. Opioid agonists
    - d. Opioid agonist-antagonists
    - e. Opioid antagonists
    - f. Benzodiazepines
    - g. Benzodiazepine antagonists
  - 4. Local anesthetics
  - 5. Muscle paralytics
  - 6. Anticholinesterase agents
  - 7. Selective relaxant binding agents
  - 8. Neuraxial analgesics
  - 9. Anticholinergics/cholinergic agonists
  - 10. Nonsteroidal antiinflammatory drugs
  - 11. Miscellaneous analgesics
  - 12. Sympathomimetics
  - 13. Inotropes
  - 14. PDE inhibitors
  - 15. Digitalis and related drugs
  - 16. Alpha- and beta-receptor antagonists
  - 17. Antihypertensives
    - a. Sympatholytics
    - b. Centrally acting alpha<sub>2</sub>-adrenergic agonists
    - c. ACE inhibitors
    - d. Angiotensin II receptor inhibitors
    - e. Nitrovasodilators
    - f. Nitric oxide
  - 18. Antidysrhythmics
  - 19. Calcium channel blockers
  - 20. Bronchodilators
  - 21. Psychopharmacologic therapy
    - a. Selective serotonin reuptake inhibitors
    - b. Tricyclic antidepressants

- c. MAO inhibitors
  - d. Lithium
- 22. Prostaglandins
- 23. Histamine receptor antagonists
- 24. Serotonin antagonists
- 25. Insulin
- 26. Oral hypoglycemic
- 27. Diuretics
- 28. Antacids
- 29. Gastrointestinal prokinetic medications (metoclopramide)
- 30. Anticoagulants
  - a. Heparin and low-molecular-weight heparins
  - b. Heparin reversal—protamine
  - c. Antiplatelet medications
  - d. Oral anticoagulants
  - e. Oral anticoagulant reversal
  - f. Thrombolytics
  - g. Thrombin inhibitors
- 31. Antimicrobials
- 32. Chemotherapeutics
- 33. Antiepileptic drugs
- 34. Antiparkinsonian drugs
- 35. Lipid-lowering agents
- 36. Herbal remedies and dietary supplements
- 37. Minerals and electrolytes
- 38. Dantrolene
- 39. Corticosteroids
- 40. Tocolytics
- 41. Uterotonics
- 42. Antifibrinolytics
- 43. Intravenous dyes
- C. Applied chemistry, biochemistry, physics
  - 1. Chemistry
    - a. Aqueous solutions and concentrations
    - b. Acids, bases, and salts
    - c. Chemical reactions: oxidation, reduction, hydrolysis, and conjugation
  - 2. Biochemistry
    - a. Metabolism
    - b. Cellular mechanisms for action
    - c. Drug receptor interaction

3. Physics
  - a. Units of measurement
  - b. Gases and gas laws
  - c. Solubility, diffusion and osmosis
  - d. Pressure and fluid flow
  - e. Electricity and electrical safety
  - f. Vaporization and humidification
  - g. Measurement of oxygen, carbon dioxide, and hydrogen ion
- II. Equipment, Instrumentation and Technology (25%)
  - A. Anesthetic delivery systems
    1. High/low pressure gas sources
    2. Regulators/manifolds
    3. Flowmeters, valves, floats
    4. Vaporizers
    5. Proportioning systems
    6. Pressure failure safety devices
    7. Fail-safe devices
    8. Ventilator
    9. Carbon dioxide absorbent
    10. Anesthetic circuits
      - a. Rebreathing, circle system
      - b. Nonrebreathing
      - c. Modified nonrebreathing
    11. Pneumatic and electronic alarm devices
  - B. Airway equipment
    1. Face masks
    2. Laryngoscope
      - a. Rigid
      - b. Videoscope
      - c. Optically enhanced scopes
    3. Flexible fiberoptic bronchoscope
    4. Endotracheal tube
    5. Endobronchial tube
      - a. Including double lumen tubes
    6. Airways
      - a. Oral
      - b. Nasal
    7. Tracheostomy tubes
    8. Supraglottic airways (i.e., LMA)
    9. Intubating supraglottic airways

- 10. Jet ventilation
- 11. Intubating stylets
- 12. Lighted stylet
- 13. Cricothyrotomy (needle and surgical)
- 14. Other
  - a. Eschmann catheter (i.e., "bougie")
  - b. Combitube
  - c. Exchange catheter
- C. Monitoring devices
  - 1. Central nervous system
    - a. Evoked potential
    - b. Intracranial pressure
    - c. Modified EEG monitor (BIS, PSArray)
    - d. Cerebral oximetry
  - 2. Cardiovascular
    - a. Electrocardiogram
    - b. Arterial pressure monitoring
    - c. Noninvasive blood pressure monitoring
    - d. Central venous pressure monitoring
    - e. Pulmonary artery pressure monitoring/SvO<sub>2</sub>
    - f. Cardiac output
    - g. Precordial/esophageal stethoscope/Doppler
  - 3. Pulmonary/airway monitoring
    - a. Capnography
    - b. Airway gas analysis
    - c. Pulse oximetry
    - d. Airway pressure
    - e. Blood gas analysis
  - 4. Peripheral nerve stimulator
  - 5. Urinary output monitoring
  - 6. Temperature monitoring
  - 7. Maternal/fetal monitoring issues
  - 8. Others
    - a. Fluid/blood warmers
    - b. Forced air warming blanket
    - c. Heat and moisture exchanger (HME)
    - d. Blood salvage (cell saver)
- D. Imaging
  - 1. Ultrasound
  - 2. Fluoroscopy

- 3. Radiography
- III. General Principles of Anesthesia (25%)
  - A. Ethical considerations
  - B. Legal issues
  - C. Safety and wellness
    - 1. Substance abuse (impairment, disorder, and other considerations)
    - 2. Issues surrounding patient safety
  - D. Preoperative assessment and preparation of patient
  - E. Fluid volume assessment and management
    - 1. Fluid/blood component therapy replacement
    - 2. Bloodless medicine (including cell saver and hemodilution techniques)
  - F. Positioning
    - 1. Techniques
    - 2. Physiological alterations
    - 3. Complications
  - G. Utilization and interpretation of data
    - 1. Lab tests
    - 2. Diagnostic exams
    - 3. Intraoperative monitoring data
  - H. Airway management
    - 1. Assessment
    - 2. Techniques, procedures, and devices
    - 3. Complications
    - 4. Difficult airway management
    - 5. Retrograde intubation
  - I. Local/regional anesthetics (technique, physiologic alterations, complications)
    - 1. Anatomy
    - 2. Infiltration
    - 3. Topical
    - 4. Neuraxial blocks
    - 5. Peripheral blocks
    - 6. Other blocks (airway, retrobulbar)
    - 7. Ultrasound and/or nerve stimulator guided concepts and techniques
  - J. Light, moderate, and deep sedation (monitored anesthesia care)
  - K. Pain management
    - 1. Acute
    - 2. Chronic (pathophysiology, techniques, management of patients)
      - a. Pathophysiology
      - b. Techniques
      - c. Management of patients



- L. Pain theory (anatomy, physiology, pathology, and psychodynamics)
- M. Other techniques
  - 1. Hypotensive
  - 2. Enhanced recovery after surgery (ERAS)
- N. Postanesthesia care/respiratory therapy
- IV. Anesthesia for Surgical Procedures and Special Populations (25%)
  - A. Surgical and diagnostic anesthesia, including management of complications
    - 1. Intraabdominal-laparoscopic versus open
      - a. Hepatobiliary system
      - b. Gastrointestinal tract procedures
      - c. Endocrine organ procedures
      - d. Renal/genitourinary
      - e. Gynecologic procedures
      - f. Peritoneal procedures (including hernia repair)
    - 2. Extrathoracic
      - a. Breast
      - b. Plastics and/or reconstructive
    - 3. Head
      - a. Extracranial
        - 1) Otolaryngological
        - 2) Ophthalmologic
        - 3) Nasal
        - 4) Craniofacial
        - 5) Plastics and/or reconstructive
        - 6) Orthodontic/dental
      - b. Intracranial
        - 1) Decompression (burr holes, ventriculoperitoneal shunt)
        - 2) Space-occupying lesion
        - 3) Vascular
        - 4) Transsphenoidal hypophysectomy
        - 5) Stereotactic procedures
    - 4. Intrathoracic (including open and thoracoscopic approach)
      - a. Diaphragm
      - b. Endoscopic procedures (bronchoscopy, mediastinoscopy)
      - c. Esophagus
      - d. Heart
      - e. Lung
      - f. Mediastinal
    - 5. Neck

- a. Larynx/trachea (including tracheostomy)
- b. Lymph node biopsies
- c. Parathyroid/thyroid
- d. Neck tumors
- e. Radical neck dissection
- 6. Neuroskeletal
  - a. Cervical spine (anterior and posterior approach)
  - b. Laminectomy/discectomy fusions at all levels
  - c. Pain management procedures
  - d. Spinal cord procedures
  - e. Surgical sympathectomy
  - f. Vertebroplasty
  - g. Scoliosis repair
- 7. Orthopedic
  - a. Arthroscopic procedures
  - b. Closed reduction
  - c. Fractures
  - d. Total joint replacements/arthroplasty
  - e. Procedures of the hand and foot
- 8. Perineal and pelvic procedures
  - a. Gynecologic
  - b. Genitourinary
  - c. Anal/rectal
- 9. Vascular (open versus endovascular)
  - a. Carotid
  - b. Thoracic
  - c. Abdominal (including renal)
  - d. Extremity
    - 1) Occlusive disease
    - 2) Vascular access
    - 3) Vein stripping
  - e. Thromboembolic prevention
  - f. Surgical management of portal hypertension
- 10. Diagnostic/therapeutic
  - a. Venous/arterial catheterization
  - b. Interventional cardiology
    - 1) Cardioversion
    - 2) Defibrillation (including AED)
    - 3) Pacemakers
    - 4) Automated internal cardiac defibrillator devices

- c. Diagnostic imaging
- d. Electroconvulsive therapy
- e. Interventional radiology
- f. Radiation therapy
- g. Endoscopy
- 11. Other surgical procedures
  - a. Trauma
  - b. Burns
  - c. Resuscitation
  - d. Organ transplants (including management of posttransplant patient for nontransplant surgery)
  - e. Organ procurement
  - f. Laser procedures
- B. Anesthesia for special populations
  - 1. Pediatrics
    - a. Anatomy, physiology, and pathophysiology
      - 1) Normal
      - 2) Prematurity
      - 3) Congenital anomalies
    - b. Pharmacology
    - c. Anesthesia techniques/procedures
    - d. Management of complications
  - 2. Obstetrics
    - a. Anatomy, physiology, and pathophysiology
    - b. Pharmacology
    - c. Anesthesia techniques/procedures
    - d. High-risk parturients
    - e. Nonobstetric surgery in the parturient
    - f. Management of complications
  - 3. Geriatrics
    - a. Anatomy, physiology, and pathophysiology
    - b. Pharmacology
    - c. Anesthesia techniques/procedures
    - d. Management of complications
  - 4. Obesity
    - a. Anatomy, physiology, and pathophysiology
    - b. Pharmacology
    - c. Anesthesia techniques/procedures (including bariatric)
    - d. Management of complications

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