MOCA 2.0®
Maintenance of Certification in Anesthesiology® (MOCA®)

Revised - January 2020
# Table of Contents

I. **FUNDAMENTAL TOPICS IN ANESTHESIOLOGY** ................................................................. 1  
   I.A Anesthesia Machines and Breathing Systems ............................................................ 1  
   I.B Mechanical or Assisted Ventilation ............................................................................. 1  
   I.C Monitoring ................................................................................................................. 1  
   I.D Electrical and Fire Safety ......................................................................................... 2  

II. **PHARMACOLOGY** .......................................................................................................... 2  
   II.A General Concepts .................................................................................................... 2  
   II.B Anesthetic Gases and Vapors ................................................................................. 3  
   II.C Intravenous Anesthetics ........................................................................................ 3  
   II.D Local Anesthetics .................................................................................................... 3  
   II.E Neuromuscular Blocking Agents .......................................................................... 3  

III. **CLINICAL SCIENCES: ANESTHESIA PROCEDURES, METHODS, AND TECHNIQUES** ........ 4  
    III.A Patient Evaluation and Preoperative Preparation ............................................... 4  
    III.B Perioperative Management of Patients with Chronic Disease States .............. 4  
    III.C Regional Anesthesia ............................................................................................ 6  
    III.D General Anesthesia ............................................................................................. 6  
    III.E Monitored Anesthesia Care and Sedation ............................................................ 7  
    III.F Asanguineous Intravenous Fluid Therapy during Anesthesia ......................... 7  
    III.G Perioperative Complications: Types, Prevention, Treatment ......................... 7  
    III.H Postoperative Period .......................................................................................... 8  

IV. **ORGAN-BASED BASIC AND CLINICAL SCIENCES** .................................................... 8  
    IV.A Central and Peripheral Nervous Systems ............................................................... 8  
    IV.B Respiratory System ............................................................................................... 9  
    IV.C Cardiovascular System ......................................................................................... 11  
    IV.D Gastrointestinal/Hepatic Systems ...................................................................... 12  
    IV.E Renal and Urinary Systems/Electrolyte Balance .................................................. 13  
    IV.F Hematologic System .............................................................................................. 14  
    IV.G Endocrine and Metabolic Systems ..................................................................... 14  
    IV.H Neuromuscular System ....................................................................................... 15  

V. **CLINICAL SUBSPECIALTIES** ...................................................................................... 16  
   V.A Chronic Pain Management ...................................................................................... 16  
   V.B Pediatric Anesthesia ............................................................................................... 16  
   V.C Obstetric Anesthesia ................................................................................................ 18  
   V.D Otorhinolaryngology (ENT) Anesthesia ................................................................. 20  
   V.E Anesthesia for Plastic Surgery ............................................................................... 21  
   V.F Anesthesia for Laparoscopic Surgery .................................................................... 21  
   V.G Ophthalmologic Anesthesia .................................................................................... 21  
   V.H Orthopedic Anesthesia ........................................................................................... 21  
   V.I Trauma Anesthesia ................................................................................................... 22  
   V.J Anesthesia for Ambulatory Surgery ....................................................................... 23  
   V.K Geriatric Anesthesia/Aging ..................................................................................... 23
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>V.I</td>
<td>Critical Care Anesthesia</td>
<td>24</td>
</tr>
<tr>
<td>V.II</td>
<td>Neuroanesthesia</td>
<td>25</td>
</tr>
<tr>
<td>V.III</td>
<td>Thoracic Anesthesia</td>
<td>26</td>
</tr>
<tr>
<td>V.IV</td>
<td>Cardiac Anesthesia</td>
<td>27</td>
</tr>
<tr>
<td>V.V</td>
<td>Vascular Anesthesia</td>
<td>28</td>
</tr>
<tr>
<td>V.VI</td>
<td>Regional Anesthesia</td>
<td>29</td>
</tr>
<tr>
<td>V.VII</td>
<td>Acute Pain Management</td>
<td>31</td>
</tr>
<tr>
<td>VI</td>
<td>SPECIAL PROBLEMS OR ISSUES IN ANESTHESIOLOGY</td>
<td>32</td>
</tr>
<tr>
<td>VI.A</td>
<td>Electroconvulsive Therapy</td>
<td>32</td>
</tr>
<tr>
<td>VI.B</td>
<td>Organ Donors</td>
<td>32</td>
</tr>
<tr>
<td>VI.C</td>
<td>Radiologic Procedures</td>
<td>32</td>
</tr>
<tr>
<td>VI.D</td>
<td>Physician Impairment or Disability</td>
<td>32</td>
</tr>
<tr>
<td>VI.E</td>
<td>Ethics, Practice Management, and Medicolegal Issues</td>
<td>33</td>
</tr>
<tr>
<td>VII</td>
<td>QUALITY IMPROVEMENT</td>
<td>33</td>
</tr>
<tr>
<td>VII.A</td>
<td>Quality Improvement Basics: Design, Analysis, Implementation of QI Project</td>
<td>33</td>
</tr>
<tr>
<td>VIII</td>
<td>OVERVIEW OF ANESTHESIOLOGY TOPICS</td>
<td>33</td>
</tr>
<tr>
<td>VIII.A</td>
<td>Review of Current Topics in Anesthesiology</td>
<td>33</td>
</tr>
<tr>
<td>IX</td>
<td>CRITICAL CARE MEDICINE</td>
<td>33</td>
</tr>
<tr>
<td>IX.A</td>
<td>Basic Pathophysiology</td>
<td>33</td>
</tr>
<tr>
<td>IX.B</td>
<td>Critical Illness Diagnosis and Management</td>
<td>38</td>
</tr>
<tr>
<td>IX.C</td>
<td>Specialized Areas</td>
<td>48</td>
</tr>
<tr>
<td>X</td>
<td>PAIN MEDICINE</td>
<td>51</td>
</tr>
<tr>
<td>X.A</td>
<td>General</td>
<td>51</td>
</tr>
<tr>
<td>X.B</td>
<td>Assessment and Psychology of Pain</td>
<td>52</td>
</tr>
<tr>
<td>X.C</td>
<td>Treatment of Pain: Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, and Indications/Contraindications</td>
<td>53</td>
</tr>
<tr>
<td>X.D</td>
<td>Treatment of Pain: Other Methods</td>
<td>54</td>
</tr>
<tr>
<td>X.E</td>
<td>Tissue Pain</td>
<td>55</td>
</tr>
<tr>
<td>X.F</td>
<td>Visceral Pain</td>
<td>57</td>
</tr>
<tr>
<td>X.G</td>
<td>Headache and Facial Pain</td>
<td>58</td>
</tr>
<tr>
<td>X.H</td>
<td>Neuropathic pain</td>
<td>58</td>
</tr>
<tr>
<td>X.I</td>
<td>Special Cases</td>
<td>59</td>
</tr>
<tr>
<td>XI</td>
<td>PEDIATRIC ANESTHESIOLOGY</td>
<td>60</td>
</tr>
<tr>
<td>XI.A</td>
<td>Basic Science</td>
<td>60</td>
</tr>
<tr>
<td>XI.B</td>
<td>Organ-Based Basic and Clinical Sciences</td>
<td>60</td>
</tr>
<tr>
<td>XI.C</td>
<td>Clinical Subspecialties</td>
<td>63</td>
</tr>
<tr>
<td>XI.D</td>
<td>Clinical Science of Anesthesia</td>
<td>64</td>
</tr>
<tr>
<td>XI.E</td>
<td>Special Problems or Issues</td>
<td>65</td>
</tr>
</tbody>
</table>
I. FUNDAMENTAL TOPICS IN ANESTHESIOLOGY
   A. Anesthesia Machines and Breathing Systems
      1. Components
         TAGS:
         Circuit Types
         CO₂ Absorbers
         High and Low Pressure Components
         MRI Compatibility
         Oxygen Supply Systems
         Valves
         Vaporizers
         Waste Gas Evacuation Systems
      2. Safety Features
         TAGS:
         Troubleshooting
      3. Design and Ergonomics
   B. Mechanical or Assisted Ventilation
      1. Classifications
         TAGS:
         High Frequency Ventilation
         Modes of Mechanical Ventilation
         Non-Invasive Techniques
      2. Parameters
         TAGS:
         Ventilator Settings and Controls
      3. Drug Delivery Systems
         TAGS:
         Inhaled Nitric Oxide
         Nebulizers
      4. Ventilation Monitors
         TAGS:
         Apnea, FiO₂, Airway Pressure Monitoring
   C. Monitoring
      1. Basic Physiologic
         TAGS:
         Capnography
         ECG
         Neuromuscular Blockade
         Noninvasive Blood Pressure
         Pulse Oximetry
         Temperature
      2. Advanced Physiologic
         TAGS:
         Arterial Wave Form Analysis
         Cardiac Output
         Cerebral Oximetry
         EEG
         Neurophysiologic Monitors
Point of Care Ultrasound
Stroke Volume Assessment
TEE
TTE

3. Intraoperative Blood Monitoring

**TAGS:**
- Arterial Blood Gas
- Coagulation
- Glucose
- Point of Care Laboratory Testing

D. Electrical and Fire Safety

1. National Fire Protection Association (NFPA) Standards
2. Fire and Explosion Hazards

**TAGS:**
- Fuels
- Oxidizers
- Sources of Ignition

3. Electrical Safety Systems

**TAGS:**
- Isolated and Grounded Power Systems
- Line Isolation Monitors

4. Electrical Hazards

**TAGS:**
- Macroshock
- Microshock

II. PHARMACOLOGY

A. General Concepts

1. Pharmacogenetics

**TAGS:**
- Butyrylcholinesterase (Pseudocholinesterase) Deficiency
- Genetic Factors in Drug Dose-Response Relationships
- Malignant Hyperthermia (MH)
- Polymorphisms of Drug Metabolism

2. Drug Interactions

**TAGS:**
- Drug-Drug Binding
- Enzyme Induction
- Enzyme Inhibition
- Perioperative Implications of Alternative and Herbal Medicines
- Synergistic Drug Interactions

3. Drug Reactions

**TAGS:**
- Anaphylactoid
- Anaphylaxis
- Idiosyncratic

4. Substance Use Disorder

**TAGS:**
- Anesthetic Implications
Pharmacologic Mechanisms
Physiologic Effects
5. Agonists and Antagonists
B. Anesthetic Gases and Vapors
   1. Indications and Contraindications
   2. Pharmacokinetics
      TAGS:
         Metabolism and Excretion
         Uptake and Distribution
   3. Pharmacodynamics
      TAGS:
         Effects on Circulation
         Effects on Other Organs
         Effects on Central Nervous System
         Effects on Ventilation
   4. Drug Interactions
   5. Side Effects and Toxicity
C. Intravenous Anesthetics: Opioid and Non-Opioid
   1. Indications and Contraindications
   2. Pharmacokinetics
      TAGS:
         Distribution and Redistribution
         Metabolism and Excretion
   3. Pharmacodynamics
      TAGS:
         Effects on Circulation
         Effects on Other Organs
         Effects on the Central Nervous System
         Effects on Ventilation
   4. Drug Interactions
   5. Side Effects and Toxicity
D. Local Anesthetics
   1. Indications and Contraindications
   2. Pharmacokinetics
      TAGS:
         Metabolism and Excretion
         Uptake and Distribution
   3. Pharmacodynamics
      TAGS:
         Effects on Circulation
         Effects on Other Organs
         Effects on the Central Nervous System
         Effects on Ventilation
   4. Drug Interactions
   5. Side Effects and Toxicity
E. Neuromuscular Blocking Agents: Depolarizing and Non-Depolarizing
   1. Indications and Contraindications
   2. Pharmacokinetics
II.E.2

TAGS:
Distribution and Redistribution
Metabolism and Excretion
Prolongation of Action

3. Pharmacodynamics
TAGS:
Differential Effects on Muscle Groups
Effects on Neuromuscular Transmission

4. Drug Interactions

5. Side Effects and Toxicity
TAGS:
Anaphylaxis
Critical Illness Myopathy

6. Reversal of Blockade
TAGS:
Antagonism
Chelation

III. CLINICAL SCIENCES: ANESTHESIA PROCEDURES, METHODS AND TECHNIQUES

A. Patient Evaluation and Preoperative Preparation
   1. History and Physical Examination
   2. Airway Evaluation
      TAGS:
      Predictors of Difficult Laryngoscopy and Intubation
      Predictors of Difficult Mask Ventilation
   3. Standards and Guidelines
      TAGS:
      ACC/AHA Guidelines on Perioperative Cardiovascular Evaluation
      Indications for Preoperative Testing
      Preoperative Laboratory Assessment of Hepatic Function
   4. Preoperative Management of Chronic Medications
      TAGS:
      Anticoagulants and Antiplatelet Medications
      Antihyperglycemics
      Cardiovascular Medications
      Central Nervous System Medications
   5. Premedication
      TAGS:
      Antibiotics
      Anxiolysis
      Aspiration Prophylaxis
      PONV Prophylaxis
   6. Patients with Specific Disease States
      TAGS:
      Preoperative Evaluation of the Patient with Cardiovascular Disease
      Preoperative Evaluation of the Patient with Pulmonary Disease

B. Perioperative Management of Patients with Chronic Disease States
   1. Central and Peripheral Nervous System
      TAGS:
Chronic Pain States
Dementia
Multiple Sclerosis
Parkinson’s
Spinal Cord Injury

2. Respiratory System

TAGS:
Asthma
COPD
Sleep Apnea
Smoking

3. Cardiovascular System

TAGS:
Coronary Artery Disease/Stents
Heart Failure
Pacemakers/Defibrillators
Valvular Disease

4. Gastrointestinal/Hepatic Systems

TAGS:
Eating Disorders
GERD
Liver Failure

5. Renal and Urinary Systems

TAGS:
End Stage Renal Disease and Dialysis

6. Hematologic System

TAGS:
Anemia
Coagulopathies
Sickle Cell

7. Endocrine and Metabolic Systems

TAGS:
Diabetes
Morbid Obesity
Pheochromocytoma
Thyroid Disease

8. Neuromuscular Diseases

TAGS:
Muscular Dystrophies
Myasthenia
Myopathies

9. Special Problems

TAGS:
Allergic Reactions
Chemotherapy
Chronic Alcohol Use
Chronic Immunosuppression
Malignancy
C. Regional Anesthesia

1. General Topics
   
   **TAGS:**
   - Indications and Contraindications
   - Guidelines and Standards
   - Local Anesthetic Systemic Toxicity
   - Nerve Stimulator Guidance
   - Ultrasound Guidance

2. Neuraxial
   
   **TAGS:**
   - Complications
   - Epidural Test Dose
   - Factors Influencing Onset and Duration
   - Indications and Contraindications
   - Medications: Local Anesthetics, Opioids, Adjuncts
   - Types: Caudal, Epidural, Spinal, CSE

3. Regional Blocks
   
   **TAGS:**
   - Complications
   - Factors Influencing Onset and Duration
   - Indications and Contraindications
   - Intraneural Injections
   - Medications: Local anesthetics, Opioids, Adjuncts
   - Specific Blocks: Head and Neck, Upper and Lower extremity, Truncal

4. IV Regional
   
   **TAGS:**
   - Complications
   - Indications and Contraindications
   - Factors Influencing Onset and Duration
   - Medications: Local Anesthetics, Opioids, Adjuncts

D. General Anesthesia

1. Techniques
   
   **TAGS:**
   - Combined General/Regional
   - Inhalational
   - Total Intravenous

2. Airway Management
   
   **TAGS:**
   - Airway Management Devices and Adjuncts
   - ASA Difficult Airway Algorithm
   - Complications
   - Cuff Pressure Management
   - Emergency Surgical Airway
   - Endotracheal Tube Types
   - Flexible Fiberoptic Bronchoscopy
   - Indications for Endobronchial Intubation
Indications for Neuromuscular Blockade
Postoperative Considerations
Regional Airway Blocks
Translaryngeal Jet Ventilation

E. Monitored Anesthesia Care and Sedation
   1. Guidelines and Standards
   2. Levels of Sedation
   3. Sedation Guidelines for Non-Anesthesiologists

F. Asanguineous Intravenous Fluid Therapy during Anesthesia
   1. Indications and Contraindications
      TAGS:
      Colloids
      Hypertonic Saline
      Lactated Ringer's
      Normal Saline
      Plasmalyte™
   2. Complications
   3. Goal-Directed

G. Perioperative Complications: Types, Prevention, Treatment
   1. Types
      TAGS:
      Airway Burns
      Anaphylaxis
      Arterial Thrombosis
      Aspiration of Gastric Contents
      Bronchospasm
      Burns
      Cerebrovascular Accident
      Corneal Abrasions
      Esophageal Injury
      Hypothermia and Hyperthermia
      Laryngospasm
      Myocardial Ischemia/Infarction
      Positioning Complications
      Post-Obstructive Pulmonary Edema
      Postoperative Visual Loss
      Shivering
      Tourniquet, Adverse Effects of
      Unintended Intraoperative Awareness
      Vascular Trauma
      Vascular Air Embolism
      Venous Thromboembolism
   2. Prevention and Treatment
      TAGS:
      Airway Fire Prevention
      Management of Intraoperative Patient Temperature
      Perioperative Anticoagulation
      Strategies to Minimize Patient Harm
H. Postoperative Period

1. Emergence and Recovery of Airway Reflexes
2. Acute Pain Management
   \textbf{TAGS:}
   - Field Block
   - Multimodal Analgesia Strategies
   - Opioids
   - Patient-Controlled Analgesia (PCA)
   - Regional Anesthesia/Nerve Blocks
   - Systemic Local Anesthetics

3. Respiratory Complications in the PACU
   \textbf{TAGS:}
   - Consequences of Anesthesia
   - Consequences of Surgery

4. Cardiovascular Complications in the PACU
   \textbf{TAGS:}
   - Arrhythmias
   - Hypertension
   - Hypotension
   - Myocardial Ischemia

5. Nausea and Vomiting
   \textbf{TAGS:}
   - Etiology
   - Multimodal Drug Therapy

6. Residual Neuromuscular Blockade
   \textbf{TAGS:}
   - Etiology
   - Prevention
   - Recognition
   - Treatment

7. Neurologic Consequences of Surgery and Anesthesia
   \textbf{TAGS:}
   - Cognitive Dysfunction
   - Delirium
   - Failure to Emerge from Anesthesia
   - Stroke

IV. ORGAN-BASED BASIC AND CLINICAL SCIENCES

A. Central and Peripheral Nervous Systems

1. Anatomy
   \textbf{TAGS:}
   - Autonomic Nervous System
   - Blood-Brain Barrier
   - Brain
   - Cranial Nerves
   - Peripheral Nerves
   - Spinal Cord
   - Vascular Anatomy
   - Venous Sinuses and Drainage
2. Physiology

TAGS:
- Autoregulation
- Drug Effects
- Intracranial Pressure
- Metabolism
- Spinal Reflexes
- Vagal Reflex

3. Pharmacology

TAGS:
- Anticonvulsants
- Drug Effects on CNS Blood Flow
- Drug Effects on CNS Metabolism
- Osmotic Agents

4. Clinical Science

TAGS:
- Abscess
- Air Embolism
- Airway Management in the Patient with Cervical Spine Disease
- Autonomic Hyperreflexia
- Cerebrovascular Accident (CVA)
- Coma
- Drug Intoxication
- Fluid Management
- Head Stabilization in Pins
- Hydrocephalus
- Pituitary Adenomas
- Prone and Sitting Positioning: Implications
- Seizures
- Spinal Shock
- Subdural and Epidural Hematomas
- Trans-Sphenoidal Hypophysectomy
- Tumors
- Ventriculostomy

B. Respiratory System

1. Anatomy

TAGS:
- Alveoli/ Lung Parenchyma
- Larynx
- Musculoskeletal
- Tracheo-Bronchial tree
- Innervation
- Vascular Supply

2. Physiology: Lung Functions and Cellular Processes

TAGS:
- Alveolar-Arterial O₂ Gradient (A-aDO₂)
- Anion Gap
- Apneic Oxygenation
Arterial-Alveolar CO₂ Gradient (A-aDCO₂)
Central and Peripheral Chemoreceptors
CO₂ and O₂ Response Curves
CO₂ Production
Control of Ventilation
Dead Space to Tidal Volume Ratio (Vd/Vt)
Diffusion Hypoxia
Hypoxic Pulmonary Vasoconstriction
Lung Mechanics
Non-Respiratory Functions of Lungs: Immune and Metabolic
Normal Acid-Base Regulation: Buffer Systems
Pleural Pressure Gradient
Surfactant
Systemic Effects of Hypercarbia and Hypocarbia
Systemic Effects of Hypoxia and Hyperoxia
V/Q Mismatch
Work of Breathing

3. Pharmacology

TAGS:
Antiinflammatory Medications
Bronchodilators

4. Clinical Science

TAGS:
Arterial Blood Gas Interpretation
Abdominal Compartment Syndrome
Asthma
Atelectasis
Barotrauma
Bronchiectasis
Bronchitis
Bronchopleural Fistula
Bronchopulmonary Dysplasia
Bronchospasm: Management
Chest Trauma
Chest X-ray: indications and interpretation
Complications and Side Effects of Mechanical Ventilation
COPD
Cystic Fibrosis
Empyema
Foreign Body
Hemothorax
Lung Abscess
Mediastinal Masses
Neoplasm
Nonventilatory Respiratory Management
Obstructive Sleep Apnea
Oxygen Therapy and Toxicity
Pleural Effusion
Pneumonia
Pneumothorax
Postoperative Extubation Criteria
Postoperative Mechanical Ventilation
Pulmonary Fibrosis
Respiratory Distress Syndrome (ARDS)
Respiratory Failure Management

C. Cardiovascular System

1. Anatomy
   **TAGS:**
   Conduction System
   Coronary Circulation
   Innervation
   Major Blood Vessels
   Normal Cardiac Anatomy
   Radiographic Chest Anatomy
   Transesophageal Echocardiography (TEE) Views

2. Physiology
   **TAGS:**
   Baroreceptor Function
   Cardiac Output: Regulation
   Control of Heart Rate
   Coronary Blood Flow Regulation
   Determination of Myocardial Oxygen Demand
   Diastolic Dysfunction
   Normal Intracardiac Pressures
   Mixed Venous Oxygen Tension and Saturation
   Myocardial Contractility
   Myocardial Oxygen Utilization
   Preload and Afterload
   Systemic and Pulmonary Vascular Resistance
   Valve Function
   Vascular Compliance/Venous Capacitance
   Venous Return

3. Pharmacology
   **TAGS:**
   Angiotensin Receptor Blockers
   Angiotensin Converting Enzyme Inhibitors
   Antianginal Drugs
   Antiarrhythmics
   Betablockers
   Calcium Channel Blockers
   Chronotropes
   Digitalis
   Inotropes
   Statins
   Vasodilators
   Vasopressors
4. Clinical Management of Disease States

**TAGS:**
- Cardiac Ischemia
- Cardiac Tamponade and Constrictive Pericarditis
- Cardiac Valvular Abnormalities
- Cardiogenic Shock
- Carotid Artery Disease
- Heart Failure and Cardiomyopathy
- Hypertrophic Cardiomyopathy
- Intracardiac Defects
- Myocardial Infarction and Acute Coronary Syndrome
- Myocarditis
- Peripheral Vascular Disease
- Pulmonary Embolism
- Pulmonary Hypertension
- Rhythm Disturbances
- Right or Left Ventricular Dysfunction

5. Special Considerations in Cardiovascular Anesthesia

**TAGS:**
- Cardiac Ablations
- Cardiac Catheterization
- Cardiac Implantable Electrical Device Management: AICD and Pacemakers
- Left Ventricular Assist Devices
- Perfusion Studies

D. Gastrointestinal/Hepatic Systems

1. Anatomy

**TAGS:**
- Arterial Blood Supply (Celiac, Superior and Inferior Mesenteric Arteries)
- Esophageal Diverticuli
- Esophageal Sphincters
- Hepatic Artery Anatomy
- Innervation-Sympathetic, Parasympathetic and Enteric
- Portal Venous Anatomy
- Segmental Hepatic Anatomy
- Splanchnic Venous Bed

2. Physiology

**TAGS:**
- Cytochrome P450 Function and Variants
- Dual Hepatic Blood Supply
- Excretory Functions
- Factors Affecting Splanchnic Blood Volume
- Metabolic and Synthetic Functions
- Portal Hypertension

3. Pharmacology

**TAGS:**
- Drug Hepatoxicity
- Neuromuscular Blocking Drugs
- Sedative-Hypnotic Drugs
4. Clinical Science

**TAGS:**
- Acute Hepatitis
- Anesthetic Management: Full Stomach
- Anesthetic Management: Intestinal obstruction
- Cricoid Pressure
- Esophageal Disease
- Fluid Management for Hepatic Resection
- Hepatic Encephalopathy
- Hepatic Failure
- Hepatorenal Syndrome
- Implication of Ascites
- Liver Transplantation
- Morbid Obesity/Anesthesia for Bariatric Surgery
- Nitrous Oxide and GI Surgery
- Postoperative Hepatic Dysfunction
- Postoperative Ileus

E. Renal and Urinary Systems/Electrolyte Balance

1. Clinical Science

**TAGS:**
- Factors Affecting Glomerular Filtration
- Factors Impacting Renal Blood Flow
- Hormonal Regulation of Extracellular Fluid
- Hormonal Regulation of Osmolality
- Pathophysiology of Renal Disease
- Regulation of Acid-Base Balance
- Regulation of Blood Volume
- Renal Drug Excretion
- Renal Function Tests
- Tubular Reabsorption and Secretion
- Water and Electrolytes: Distribution and Balance

2. Pharmacology

**TAGS:**
- Diuretics
- Dopaminergic Drugs
- Drug Effects on Electrolytes and Acid-Base Balance
- Pharmacologic Protection and Treatment of Renal Failure

3. Clinical Management of Disease States

**TAGS:**
- Anesthetic Management in Chronic Renal Insufficiency and Renal Failure
- Anesthetic Management for Renal Transplantation
- Anesthetic Management for Patients on Renal Replacement Therapy
- Arteriovenous (A-V) Shunts
- Perioperative Oliguria and Anuria
- Protection of Renal Function in Vascular Surgery and with Radiocontrast Exposure
- Risk Factors for Acute Renal Failure

4. Special Considerations with the Renal System

**TAGS:**
Renal Cancer with IVC Tumor Invasion
Transurethral Resection of Prostate (TURP) - Complications
Urologic Surgery - Lithotripsy

F. Hematologic System
1. Anatomy
2. Physiology
   TAGS:
   Compensatory Mechanisms
   Normal Hemostatic Mechanisms
3. Pharmacology
   TAGS:
   Anticoagulants and Antagonists
   Anti-Platelet Drugs
   Blood Substitutes
   Coagulation Factor Replacement Therapy
   Erythropoietin
   Immunosuppressive and Anti-Rejection Drugs
   Iron Therapy
4. Clinical Science
   TAGS:
   Alternatives to Transfusion
   Anemias
   Autologous Blood Donation
   Blood Products
   Citrate Intoxication
   Congenital and Acquired Factor Deficiencies
   Disseminated Intravascular Coagulation
   Fibrinolysis
   Hemoglobinopathies
   Hypothermia: Effects
   Infections: Cytomegalovirus (CMV), HIV, Hepatitis
   Massive Transfusion: Acquired Coagulopathy
   Massive Transfusion Protocol
   Porphyrias
   Thrombocytopenia and Thrombocytopathy
   Transfusion Complications including TACO and TRALI
   Transfusion Indications
   Transfusion: Infection Risks

G. Endocrine and Metabolic Systems
1. Anatomy
   TAGS:
   Endocrine Tumors
2. Physiology
   TAGS:
   Adrenal Cortex and Pancreas
   Adrenal Medulla
   Hypothalamus
   Parathyroid
Pituitary- Anterior and Posterior
Thyroid

3. Pharmacology
   **TAGS:**
   - Antihyperglycemic Drugs
   - Glucocorticoid Supplementation
   - Mineralocorticoid Supplementation
   - Somatostatin/Octreotide

4. Clinical Science
   **TAGS:**
   - Acromegaly
   - Addison's Disease
   - Carcinoid Syndrome
   - Cushing's Disease
   - Cushing's Syndrome
   - Diabetes Insipidus
   - Diabetic Ketoacidosis
   - Diabetes Mellitus
   - Hyperosmolar Coma
   - Inappropriate ADH Secretion
   - Large Thyroid Goiter: Management
   - Parathyroid Disease: Hyper and Hypoparathyroidism
   - Pancreas Transplantation
   - Panhypopituitarism- Substitution Therapy
   - Pheochromocytoma
   - Pituitary Disease: Hyper and Hypopituitarism
   - Primary Aldosteronism
   - Recurrent Laryngeal Nerve Injury
   - Thyroid Disease: Hyper and Hypothyroidism
   - Thyroid Storm Management

5. Biochemistry of Normal Body Metabolism
   **TAGS:**
   - Antidiuretic Hormone
   - Control of Blood Glucose
   - Glucagon
   - Glucocorticoids
   - Human Growth Hormone
   - Insulin
   - Lipoproteins and Triglycerides
   - Liver Metabolism
   - Surgical Stress Response

H. Neuromuscular System

1. Anatomy
   **TAGS:**
   - Acetylcholine Receptor
   - Motor Neurons

2. Physiology
   **TAGS:**
Factors Impacting Muscle Strength
Neuromuscular Transmission

3. Pharmacology

TAGS:
- Antagonists: Anticholinesterases
- Antagonists: Selective Relaxant Binding Agents
- Neuromuscular Blocking Agents: Depolarizing
- Neuromuscular Blocking Agents: Nondepolarizing

4. Diseases and Disorders: Clinical Science

TAGS:
- Demyelinating Diseases
- Myasthenic Syndromes
- Primary Muscle Diseases

V. CLINICAL SUBSPECIALTIES

A. Pain Management

1. Pathophysiology

TAGS:
- Acute Pain
- Diabetic Neuropathy
- Cancer-Related Pain
- Chronic Pain States
- Complex Regional Pain Syndrome: Types I and II
- Neuropathic Pain States
- Peripheral Neuropathies
- Phantom Limb
- Postherpetic Neuralgia
- Post-Stroke Pain
- Somatic Pain Conditions

2. Diagnostic Strategies

TAGS:
- Diagnostic Blocks
- Electromyography
- History and Physical Exam
- Imaging Modalities

3. Treatment of Painful Disease States

TAGS:
- Acupuncture
- Pharmacologic Therapy
- Electrical Stimulation
- Neuraxial Opioids
- Neurolytic and Non-Neurolytic Blocks
- Other Techniques: TENS
- Patient-Controlled Analgesia
- Peripheral Nerve Blockade and Catheters
- Spinal and Epidural Analgesia
- Substance Use Disorder
- Sympathetic Nerve Blocks

B. Pediatric Anesthesia
1. Clinical Science

**TAGS:**
- Artificial Airway Selection
- Behavioral Development
- Infants: Fluid and Glucose Management
- Infants: Respiratory Physiology
- Infants: Thermoregulation
- Malignant Hyperthermia: Susceptibility and Management
- Neonates: Transitional Circulation
- Organ Function Changes During Development
- Parental Presence
- Upper Respiratory Infections (Colds)

2. Pharmacology

**TAGS:**
- Age-Related Pharmacodynamics and Pharmacokinetics
- Anesthetic Drugs and Adjuvants
- Induction Techniques
- Inhalational Anesthetics
- Intravenous Anesthetics
- Local Anesthetics
- Opioid Tolerance and Sensitivity
- Succinylcholine: Complications

3. Clinical Management of Disease States

**TAGS:**
- Anemias: Congenital and Acquired
- Bronchopulmonary Dysplasia
- Cerebral Palsy
- Chromosomal Abnormalities
- Coagulopathies: Congenital and Acquired
- Congenital Heart Disease
- Congenital Tumors: Wilm's and Neuroblastoma
- Cystic Fibrosis
- Developmental Abnormalities
- Diaphragmatic Hernia
- Endocrine Diseases: Childhood Diabetes
- Endocrine Diseases: Congenital Adrenal Hyperplasia
- Epiglottitis
- Hydrocephalus and Shunts
- Inborn Errors of Metabolism
- Inherited Musculoskeletal Disorders
- Juvenile Rheumatoid Arthritis
- Laryngotracheobronchitis
- Myelomeningocele
- Obesity
- Obstructive Sleep Apnea
- Omphalocele and Gastroschisis
- Peritonsillar Abscess
- Pyloric Stenosis
Scoliosis
Tracheo-esophageal Fistula

4. Special Considerations in Pediatric Anesthesia

**TAGS:**
- Airway Foreign Bodies
- Apnea of Prematurity
- Bladder and Urethral Malformations
- Bronchoscopy: Flexible and Rigid
- Cleft Lip and Palate
- Congenital Hip Dysplasia
- Craniofacial Abnormalities
- Difficult Airway Management
- Difficulty with IV Access
- Jet Ventilation
- Laryngoscopy Techniques
- Laryngospasm
- Laser Implications
- Pediatric Regional Anesthetic Techniques
- Pediatric Sedation
- PONV Management
- Postoperative Pain Management: Codeine
- Premedication Techniques
- Problems with Intubation and Extubation
- Propofol Infusion Syndrome
- Strabismus
- Stridor
- Tonsillectomy and Adenoidectomy
- Ureteral Reimplantation

C. Obstetric Anesthesia

1. Clinical Science

**TAGS:**
- Anesthetic Complications
- Anesthetic Risks
- Coagulation Changes
- Combined Spinal/Epidural Technique
- Neuraxial Anesthetic Techniques: Epidural, Spinal and Caudal
- Neuraxial Labor Analgesia
- Paracervical Block
- Physiology of Labor
- Pudendal Block
- Systemic Labor Analgesia

2. Pharmacology

**TAGS:**
- Anesthetic Drugs and Adjuvants
- Drug Effects on Newborn
- Drug Metabolism
- Fetal Disposition of Drugs
- Magnesium Sulfate
Mechanisms of Placental Transfer
Oxytocic Drugs
Protein Binding of Drugs
Tocolytic Drugs

3. Clinical Management of Disease States

TAGS:
Amniocentesis
Amniotic Fluid Embolism
Antepartum Hemorrhage
Antepartum Fetal Therapy
Anticoagulant Therapy
Cardiovascular Disease
Dystocia
Ectopic Pregnancy
Endocrine Disease
Ex-utero Intrapartum Treatment (EXIT)
Fever and Infection
Fetal Malposition
Fetal Malpresentation
Gestational Trophoblastic Surgery Disease
Hematologic Disease
Maternal Cardiopulmonary Resuscitation
Multiple Gestation
Neurologic Disease
Placenta Abruption
Placenta Accreta/Increta/Percreta
Placenta Previa
Postpartum Hemorrhage
Preeclampsia and Eclampsia
Preterm Labor
Renal Disease
Respiratory Disease
Resuscitation of Newborn
Retained Placenta
Rh and ABO Incompatibility
Spontaneous Abortion
Trial of Labor after Cesarean (TOLAC)
Umbilical Cord Blood Gas Measurements
Umbilical Cord Prolapse
Uterine Atony
Uterine Rupture

4. Special Considerations in Obstetric Anesthesia

TAGS:
Abnormal Placenta
Antepartum Fetal Assessment
Aorto-Caval Compression
Cesarean Delivery: Elective Anesthesia
Cesarean Delivery: Emergency Anesthesia
Cesarean Delivery: Indications
Difficult Airway
Gastroesophageal Sphincter Function
Influence of Anesthetic Technique on Labor
Intrapartum Fetal Monitoring
Intrauterine Fetal Resuscitation
Neonatal Assessment: Apgar Score
Nonobstetric Anesthesia in Pregnancy
Operative Vaginal Delivery
Pulmonary Aspiration
Regulation of Uterine Blood Flow
Thermoregulation

5. Maternal Physiology

**TAGS:**
- Acid Base Changes
- Airway Changes
- Anatomic Position
- Barrier Function
- Cardiovascular Changes
- Coagulation Changes
- Gastrointestinal Changes
- Hematologic Changes
- Nervous System Changes
- Renal Changes
- Respiratory Changes

6. Maternal-Fetal Considerations

7. Pathophysiology of Complicated Pregnancy

D. Otorhinolaryngology (ENT) Anesthesia

1. Surgical Procedures

**TAGS:**
- Airway Endoscopy
- Microlaryngeal Surgery
- Radical Neck Dissection
- Sinus Endoscopy
- Tonsillectomy
- Uvulopalatopharyngoplasty

2. Laser Surgery

**TAGS:**
- Airway Fires
- Lasers: Safety Implications
- Laser-Safe Endotracheal Tubes

3. Anesthetic Management

**TAGS:**
- Airway Management
- Choice of Anesthetic
- Effects of Radiation Therapy
- Jet Ventilation
- Ventilation Strategies
E. Anesthesia for Plastic Surgery
1. Liposuction
2. Tumescent – Volume Overload
3. Fire Risk
4. Local Anesthetic Toxicity

F. Anesthesia for Laparoscopic Surgery
1. Surgical Procedures
   **TAGS:**
   - Appendectomy
   - Bariatric Surgery
   - Cholycestectomy
   - Gynecologic Procedures
   - Hiatus Hernia Repair
2. Anesthetic Management
   **TAGS:**
   - Monitoring
   - Patient Positioning
   - Ventilation
3. Risks
   **TAGS:**
   - Hemorrhage
   - Hypercapnea
   - Hypotension
   - Subcutaneous Emphysema
   - Vascular or Organ Perforation

G. Ophthalmologic Anesthesia
1. Clinical Science
   **TAGS:**
   - Retrobulbar and Peribulbar Blocks
2. Pharmacology
3. Clinical Management of Disease States
   **TAGS:**
   - Open Eye Injuries
4. Special Considerations in Ophthalmologic Anesthesia

H. Orthopedic Anesthesia
1. Tourniquet Management
   **TAGS:**
   - Ischemia
   - Nerve Injury
   - Reperfusion
2. Spinal Surgery
   **TAGS:**
   - Neurophysiologic Monitoring
   - Post-Operative Visual Loss
3. Complications
   **TAGS:**
   - Blood Loss
   - Fat Embolism
Methyl Methacrylate
Positioning Injury
Venous Air Embolism

4. Regional vs. General Anesthesia
5. Special Considerations in Orthopedic Surgery

TAGS:
- Ankylosing Spondylitis
- Rheumatoid Arthritis
- Scoliosis
- Thromboprophylaxis

I. Trauma Anesthesia
   1. Primary Survey and Resuscitation
      TAGS:
      - Emergency Airway
      - Hemorrhagic Shock
      - Initial Evaluation
      - Mass Casualty Response
      - Penetrating vs. Blunt Trauma
      - Prehospital and EMS
      - Team Function in Trauma
      - Triage
   2. Secondary Survey and Stabilization
      TAGS:
      - Fluid Management
      - Hemostatic Resuscitation
      - Hypothermia
      - Massive Transfusion
      - Monitoring
      - Protection of Cervical Spine
   3. Organ System Trauma
      TAGS:
      - Abdominal Trauma
      - Aortic and Vascular Trauma
      - Orthopedic and Soft Tissue Trauma
      - Spinal Cord
      - Thoracic Trauma
      - Traumatic Brain Injury
      - Traumatic Coagulopathy
   4. Thermal and Electrical Injury
      TAGS:
      - Airway Management
      - Carbon Monoxide/Carboxyhemoglobin
      - Fluids and Electrolytes
      - Inhalation Injury
      - Non-depolarizing Muscle Relaxants
      - Succinylcholine Use
      - Vasoconstrictor Effects and Complications
   5. Special Considerations in Trauma Anesthesia
      TAGS:
Decontamination
Exposure/Hypothermia
Near Drowning
Nuclear, Biological, and Chemical Injury
Pain Management
Pediatric Trauma

J. Anesthesia for Ambulatory Surgery
1. Patient Selection and Preoperative Management
2. Anesthetic Management
3. Discharge Criteria and Postoperative Follow-Up
   **TAGS:**
   Continuous Nerve Blocks
4. Office-Based Anesthesia
   **TAGS:**
   Equipment
   Organization
   Patient Management
   Safety

K. Geriatric Anesthesia/Aging
1. Preoperative Evaluation
   **TAGS:**
   Co-Existing/Chronic Disease Processes
   Medication Management
   Risk Reduction and Stratification
2. Organ Function Changes with Aging
   **TAGS:**
   Cardiovascular System
   Central Nervous System
   Endocrine System
   Hematologic System
   Hepatic System
   Renal System
   Respiratory System
3. Pharmacology
   **TAGS:**
   Adverse Response to Medications
   Beers Criteria
   Changes in PK/PD with Aging
4. Anesthetics
   **TAGS:**
   General
   Local
   Monitored Anesthesia Care
   Regional
5. Fluid Management
6. Pain Management
7. Thermoregulation
8. Ethics and Informed Consent
9. Postoperative Care and Transitions of Care

TAGS:
- Delirium
- Postoperative Cognitive Dysfunction

10. Patient Safety

L. Critical Care Anesthesia

1. Central Nervous System Dysfunction

TAGS:
- Altered Mental Status
- Brain Death
- Brain Trauma
- Metabolic Encephalopathy
- Neuromuscular Pathology
- Spinal Cord Compromise
- Stroke: Ischemic or Hemorrhagic
- Subarachnoid, Epidural Bleed

2. Cardiac Dysfunction/Failure

TAGS:
- Cardiac Interventions – Lysis, Catheter, PCI, Pacer
- Cardiogenic Shock
- Congestive Heart Failure
- Device Management
- Dysrhythmias
- Myocardial Ischemia/Infarction
- Vascular Disease – Aneurysm, Dissection, Thrombosis

3. Respiratory Dysfunction/Failure

TAGS:
- Acute Lung Injury/Acute Respiratory Distress Syndrome
- Acute or Chronic Respiratory Insufficiency or Failure
- ECMO
- Noninvasive Ventilatory Support
- Mechanical Ventilation
- Thromboembolic Disease: DVT/PE

4. Immune Dysfunction/Infection

TAGS:
- Antimicrobial Resistance
- Antimicrobials: Antibiotics, Antivirals, Antifungals, Antiparasitics
- Autoimmune Disease
- General and Universal Precautions
- Hand Washing
- Hospital Acquired Infection
- Immunosuppression
- Infection Control
- Needle Stick Injury
- Sepsis
- Septic Shock

5. Hepatic Dysfunction/Failure

TAGS:
6. Renal Dysfunction/Failure

**TAGS:**
- Acute Kidney Injury
- Chronic Kidney Disease
- Dialytic Support: CRRT, IHD
- End-stage renal disease

7. Hematologic Dysfunction

**TAGS:**
- Anemia, Neutropenia, Thrombocytopenia, Pancytopenia
- Anticoagulation/Antiplatelet/antifibrinolytic Therapy
- Bone Marrow Transplant
- Coagulopathy: DIC, Consumptive, Dilutional
- Transfusion Therapy

8. Gastrointestinal Dysfunction

**TAGS:**
- Hemorrhage
- Ileus
- Inflammatory/Infectious

9. Endocrine Dysfunction

**TAGS:**
- Adrenal
- Pancreatic
- Pituitary
- Thyroid

10. Dermatologic Dysfunction

11. Additional Critical Care Topics

**TAGS:**
- Drug Overdose
- Epidemic Management
- ICU Management/Organization
- ICU Monitoring
- ICU Procedures
- Multi-Organ Failure
- Nutritional Support
- Toxicology
- Transplantation management

M. Neuroanesthesia

1. Clinical Science

**TAGS:**
- Factors Impacting Cerebral Blood Flow
- Factors Impacting Intracranial Pressure
- Factors Impacting Neuronal Function

2. Pharmacology
TAGS:
Anesthetics
Anticonvulsants
Anti-Parkinsonian Medications
Diuretics
Fluid Management
Steroids
Vasodilators and Constrictors

3. Clinical Management of Disease States
TAGS:
Arteriovenous Malformations
Brainstem
Cerebellar Resection: Implications
Cervical Spine Disease
Coma
Hydrocephalus
Intracranial Aneurysms
Intracranial Masses
Intracranial Vascular Lesions
Moya Moya Disease
Pituitary Adenomas
Skull-base Tumors
Traumatic Brain Injury

4. Special Considerations in Neuroanesthesia
TAGS:
Cerebral Blood Flow
Cerebral Herniation
Cerebral Ischemia
Cerebral Vasospasm
Interventional Radiology
Intraoperative MRI
Neurophysiologic Monitoring
Patient Positioning
Seizures
Spinal Drains
Venous Air Embolism
Ventriculostomy

N. Thoracic Anesthesia
1. Clinical Science
TAGS:
Anesthetic Techniques for Thoracic and Pulmonary Surgery
Anesthetic Techniques for Thoracoscopic Surgery
Hypoxic Pulmonary Vasoconstriction
Ventilation-Perfusion Matching

2. Pharmacology
TAGS:
Bronchodilators
Fluid Management
Pulmonary Vasodilators

3. Clinical Management of Disease States
   TAGS:
   Bronchopulmonary Fistula
   Bullae/Recurrent Pneumothorax
   Chronic Obstructive Pulmonary Disease
   Empyema
   Endocrine-Secreting Tumors
   Myasthenia Gravis/Myasthenic Syndromes
   Reactive Airways Disease
   Restrictive Pulmonary Disease

4. Special Considerations in Thoracic Anesthesia
   TAGS:
   Esophageal Resection
   Hypoxemia
   Isolated Lung Ventilation
   Jet Ventilation
   Lung Resection
   Mediastinal Masses
   Mediastinoscopy
   Pain Management
   Pleural Disease
   Pneumonectomy
   Rigid Bronchoscopy
   Thymectomy
   Tracheal Resection

O. Cardiac Anesthesia
   1. Clinical Science
      TAGS:
      Factors Impacting Cardiopulmonary Pressures
      Factors Impacting Contractile Heart Function
      Factors Impacting Coronary Blood Flow
      Myocardial Ischemia/Reperfusion
   2. Pharmacology
      TAGS:
      Antiarrhythmics
      Anti-Platelet Agents
      Beta Blockers
      Chronotropes
      Heparin
      Inotropes
      Protamine
      Statins
      Vasodilators and Constrictors
   3. Clinical Management of Disease States
      TAGS:
      ACLS/BLS
      Aortic Aneurysm - Thoracic
Aortic Dissection
Aortic Insufficiency
Aortic Stenosis
Arrhythmias
Atrial Septal Defects
Carcinoid Heart Disease
Congenital Heart Disease in Adults
Congestive Heart Failure
Diastolic Dysfunction/Heart Failure
Endocarditis
Hypertrophic Cardiomyopathy
Ischemic Cardiomyopathy
Ischemic Coronary Disease
Mitral Regurgitation
Mitral Stenosis
Non-ischemic Cardiomyopathy
Pericardial Effusion/Tamponade
Post Cardiac Arrest Care/Normothermia/Hypothermia
Pulmonary Valve Disease
Tricuspid Regurgitation
Tricuspid Stenosis
Ventricular Septal Defects

4. Special Considerations in Cardiac Anesthesia

TAGS:
Anticoagulation and Reversal
Blood Conservation
Circulatory Assist Devices
Electrophysiologic Procedures
Extracorporeal Circulation
Pacemaker Function and Application
Unintended Intraoperative Awareness

P. Vascular Anesthesia

1. Clinical Science

TAGS:
Cardiac Risk Assessment
Factors Affecting Organ/Peripheral Perfusion

2. Pharmacology

TAGS:
Heparin
Protamine
Statins

3. Clinical Management of Disease States

TAGS:
Aortic Aneurysm
Atherosclerosis
Carotid Stenosis
Peripheral Vascular Disease

4. Special Considerations in Vascular Anesthesia
Q. Regional Anesthesia

1. General Topics

   TAGS:
   Anticoagulation in Regional Anesthesia
   Block Performance Assessment - Competency Guidelines and Standards
   Indications and Contraindications
   Informed Consent
   Nerve Localization: Nerve Stimulator
   Nerve Localization: Paresthesia, Landmark Approaches
   Nerve Structural Anatomy
   Sedation and Monitoring

2. Pharmacology

   TAGS:
   Epidural Local Anesthetics
   Epidural Opioids
   Intralipid Therapy
   Intrathecal Local Anesthetics
   Intrathecal Opioids
   Liposomal Bupivacaine
   Local Anesthetic Pharmacology
   Local Anesthetic Selection
   Markers of Vascular Injection
   Minimal Local Anesthetic Volume and Concentration
   Perineural Adjuncts

3. Neuraxial Anesthesia

   TAGS:
   Caudal Anesthesia
   Combined Spinal Epidural Anesthesia
   Complications
   Epidural Anesthesia
   Epidural Blood Patch
   Epidural Space and Spine Anatomy and Sonoanatomy
   Epidural Test Dose
   Factors Influencing Onset and Duration
   Indications and Contraindications
   Infusion Settings
   Medications: Local Anesthetics, Opioids, Adjuncts
   Patient Controlled Epidural Analgesia
   Subarachnoid Block

4. Upper Extremity Regional Anesthesia

   TAGS:
Brachial Plexus Anatomy and Sonoanatomy
Cervical Plexus Blocks: Superficial, Deep
Major Brachial Plexus Blocks: Interscalene, Supraclavicular, Infraclavicular, Axillary
Minor Brachial Plexus Blocks: Suprascapular, Axillary Nerve, Median, Radial, Ulnar

5. Lower Extremity Regional Anesthesia

TAGS:
Ankle Block
Lumbar Plexus, Femoral, and Saphenous Anatomy and Sonoanatomy
Inguinal Region Nerve Blocks: Femoral, LFCN, Obturator, Fascia Iliaca, 3-in-1
Saphenous, Adductor Canal Blocks
Sciatic Nerve and Sacral Plexus Anatomy and Sonoanatomy
Sciatic Nerve Blocks: Popliteal, Transgluteal, Infragluteal

6. Truncal Regional Anesthesia

TAGS:
Abdominal Wall Blocks: TAP, Ilioinguinal, Iliohypogastric, Rectus Sheath
Anterior and Lateral Chest Blocks: PECS, Serratus
Paravertebral Anatomy and Sonoanatomy
Paravertebral Blocks
Posterior Truncal Blocks: Quadratus Lumbrorum, Erector Spinae, Retrolaminar
Truncal Block Anatomy and Sonoanatomy

7. Complications and Side Effects

TAGS:
Epidural Hematoma
Falls
Infection: Epidural Abscess
Intraneural Injections
Local Anesthetic Systemic Toxicity
Neuropaxia, Nerve injury
Opioid
Phrenic Nerve Block
Postdural Puncture Headache
Rebound Pain

8. Ultrasound-Guided Regional Anesthesia

TAGS:
Factors Influencing Onset and Duration
Image Generation and Display
Medications: Local Anesthetics, Opioids, Adjuncts
Needle and Probe Alignment
Ultrasound Artifacts
Ultrasound Physics

9. Continuous Anesthesia

TAGS:
Ambulatory Regional Anesthesia
Indications and Contraindications
Perineural Infusions: Medications, Pumps, Dosing Parameters

10. IV Regional

TAGS:
Complications
Factors Influencing Onset and Duration
Indications and Contraindications
Medications: Local Anesthetics, Opioids, Adjuncts

R. Acute Pain Management

1. Analgesic Pharmacology

**TAGS:**
Acetaminophen
Alpha-2 agonists
Anticonvulsants
Antidepressants
Gabapentinoids
Intravenous Local Anesthetic Infusions
Intravenous Medications
Multimodal Analgesia
Muscle Relaxants
NMDA Antagonists
NSAIDs/COX-2 Inhibitors
Opioid Agonists, Antagonists
Opioids
Oral/Transdermal Opioids
Parenteral Medications
Patient- Controlled Analgesia
Transdermal Medications

2. Alternative Analgesic Modalities

**TAGS:**
Acupuncture
Complimentary Therapies
Hypnosis
TENS Therapy

3. Acute Pain Evaluation and Treatment

**TAGS:**
Acute on Chronic Pain
Cancer Pain
Discharge Planning
Escalation of Therapy
Inflammatory Pain
Neuropathic Pain
Nociceptive Pain
Opioid Conversion
Opioid-Induced Hyperalgesia
Opioid Tolerance
Oral Therapy
Parenteral Therapy
Patient-Controlled Analgesia
Physical Therapy
Psychiatric Comorbidities
Substance Use Disorder
Transdermal Therapy
Transition to Chronic Pain
4. Monitoring and Safety
   TAGS:
   Cardiopulmonary Monitoring
   Complications and Side Effects
   Controlled Substance Prescribing
   Drug Testing
   Legal Issues
   Level of Care

VI. SPECIAL PROBLEMS OR ISSUES IN ANESTHESIOLOGY
   A. Electroconvulsive Therapy
      1. Physiology
         TAGS:
         Central Nervous System Effects
         Hemodynamic Effects
      2. Pharmacology
         TAGS:
         Anticholinergics
         Beta Blockers
         Sedative-hypnotics
         Vasodilators
   B. Organ Donors
      1. Pathophysiology
      2. Clinical Management
         TAGS:
         Criteria for Brain Death
         Donation after Cardiac Death
   C. Radiologic Procedures
      1. CT Scan
         TAGS:
         Intravenous Contrast
      2. MRI-Anesthetic Implications/Management
         TAGS:
         Magnet Safety
         Monitoring
      3. Anesthesia in Locations Outside the Operating Room
         TAGS:
         Airway Management
         Monitoring Requirements
         Radiation Therapy
   D. Physician Impairment or Disability
      1. Substance Abuse
      2. Fatigue
      3. Aging
      4. Visual and Auditory Impairment
      5. Americans with Disabilities Act (ADA)
      6. Abusive or Disruptive Physicians
      7. Sexual Harassment
E. Ethics, Practice Management and Medicolegal Issues

1. Professionalism and Licensure

2. Ethics

**TAGS:**
- Do Not Resuscitate (DNR) Orders and Advance Directives
- End-of-Life Issues (Withholding/Withdrawal)
- Jehovah’s Witness Patient Care

3. Informed Consent

**TAGS:**
- Components
- Principles

4. Malpractice

**TAGS:**
- Anesthetic Accidents
- Closed Claims Findings
- Definition
- Expert Testimony
- Legal Actions and Consequences
- National Practitioner Database
- Professional Liability Insurance

5. Practice Management

**TAGS:**
- Health Insurance Portability and Accountability Act (HIPAA)
- Medicare/Medicaid Requirements
- Patient Privacy Issues

6. Costs of Medical/Anesthesia Care

**TAGS:**
- Operating Room Management

7. Patient Safety

**TAGS:**
- Disclosure of Errors to Patients
- Medication Errors: Assessment and Prevention

VII. QUALITY IMPROVEMENT

A. Quality Improvement Basics: Design, Analysis, Implementation of QI Project

1. Anesthesia Quality Institute, Data Entry, Information

**TAGS:**
- Assessing QI Methods
- Barriers to Quality Improvement
- Lean Six Sigma
- Physician Quality Reporting System: Significance and Role in Practice
- Root Cause Analysis

VIII. OVERVIEW OF ANESTHESIOLOGY TOPICS

A. Review of Current Topics in Anesthesiology

IX. CRITICAL CARE MEDICINE

A. Basic Pathophysiology

1. Central Nervous System

**TAGS:**
- Altered Mental Status
IX.A.1

Brain Death
Central Pontine Myelinolysis
Cerebral Blood Flow
Embolic/Thrombotic
Hemorrhagic
Infection
Intracranial Compliance, Mass Lesion
Ischemic
Neuromuscular Disorders
Seizures and Status Epilepticus
Spinal Cord Injury
Stroke
Vascular Malformations

2. Cardiovascular

TAGS:
Aneurysm, Abdominal
Aneurysms, Thoracic
Aortic Insufficiency
Aortic Stenosis
Aortic Valve
Asystole
Cardiac Contusion
Cardiac Transplantation
Cardiogenic
Congenital Heart Disease in Adults
Coronary Artery Disease, Myocardial Ischemia/Infarction
Diastolic Dysfunction
Dissections
Distributive
DVT
Eisenmenger Syndrome
Endocarditis
Heart Block
Hypertension
Hypertrophic Cardiomyopathy (HOCM, ASH, IHSS)
Hypovolemic
Infection/Inflammation
Intracardiac Shunts
Junctional or Nodal Rhythm
Left Ventricular
Mitral Regurgitation
Mitral Stenosis
Mitral Valve
Myocardial Function/Dysfunction
Myocarditis
Obstructive
Other Conduction Abnormalities
Other Myocardial
Oxygen Supply and Demand
Pericardial
Pericarditis
Peripheral Vascular Disease
Pulmonary Hypertension
Pulmonary Valve
Pulmonic Insufficiency
Pulmonic Stenosis
Pulseless Electrical Activity (PEA)
Rhythm Disturbances
Right Ventricular
Shock States
Structural
Supraventricular Tachyarrhythmias, Including Atrial Flutter, Fibrillation
Systemic Hypertension
Systolic Dysfunction
Tetralogy of Fallot
Trauma
Tricuspid Valve Dysfunction
Valvular
Ventricular Tachycardia/Fibrillation

3. Pulmonary

TAGS:
Airway Diseases
Airway Disruption
ARDS
Aspiration
Bronchopleural Fistula
Central
Chest Trauma
Community-acquired
Embolic Disorders
Empyema/Abscess
Health-care Associated
Hypercapnic (Acute and Chronic)
Hypoxic (Acute and Chronic)
Infection
Inflammatory and Autoimmune Diseases
Lung and Chest Wall Tumors
Lung Transplantation
Mediastinitis
Obstructive
Other Ventilation-Perfusion Abnormalities
Pleural Effusion
Pneumonia
Pneumothorax, Volutrauma
Pulmonary Mechanics
Reactive
Respiratory Failure
Restrictive
Sleep Apnea
Tracheal Disruption
Tracheobronchitis
TRALI
Ventilator-associated

4. Renal
**TAGS:**
Acute Kidney Injury
Infection
Intrinsic Renal
Post-Renal
Pre-Renal
Renal Tubular Acidosis

5. Hematologic/Oncologic
**TAGS:**
Acquired
Anemia
Bone Marrow/Stem Cell Transplantation
Carboxyhemoglobin
Coagulopathies
Congenital
DIC
Fibrinolysis
Hemoglobin Abnormalities
Isolated Factor Abnormalities
Leukemia, Lymphoma
Methemoglobin
Other Hemoglobinopathies
Polycythemia
Platelet Abnormalities
Thrombocytopenia
Thrombocytosis
Tumor Lysis Syndrome
Vitamin K Dependent Coagulopathy
White Blood Cell Disorder

6. Obstetric
**TAGS:**
Airway Changes
Coagulopathy, Bleeding Disorders
Complications of Pregnancy
Emboli
Liver Function Abnormalities
Physiology of Pregnancy
Pre-Eclampsia/Eclampsia
Pulmonary Physiology
Respiratory Physiology of Pregnancy
7. Endocrine

**TAGS:**
- Adrenal
- Adrenal Insufficiency
- Cerebral Salt Wasting
- Critical Illness Effects on Thyroid Function
- Cushing Syndrome
- Diabetes Insipidus, Including Central, Nephrogenic
- Diabetes Mellitus
- Hyperglycemia, Diabetic Ketoacidosis (DKA), Nonketotic Hyperglycemic Coma (NKHC)
- Hyperthyroidism, Including Thyroid Storm
- Hypoglycemia
- Hypothyroidism, Including Myxedema
- Pheochromocytoma
- Pituitary
- SIADH
- Thyroid Function Abnormalities

8. Gastrointestinal

**TAGS:**
- Abdominal Compartment Syndrome
- Bowel Disorders
- Diarrhea, Nausea, Vomiting
- Gall Bladder Disease (Stones, Cholecystitis)
- GI Hemorrhage
- GI Motility Dysfunction
- Hepatic
- Hepatic Dysfunction/Failure (Acute and Chronic)
- Hepatic Encephalopathy
- Hepatitis
- Hepatocellular Carcinoma
- Hepatorenal Syndrome
- Ileus
- Infectious
- Lower
- Malabsorption
- Pancreas
- Pancreatic Cancer
- Pancreatitis
- Perforation, Volvulus
- Pseudomembranous Colitis
- Stomach
- Toxic Megacolon
- Upper
- Vascular Diseases

9. Dermatologic

**TAGS:**
- Allergic Reactions
- Cellulitis
Disruption of the Skin Barrier
Infection
Inflammatory Diseases of the Skin
Necrotizing Fasciitis
Stevens Johnson Syndrome

10. Immunologic/Infectious Disease

**TAGS:**
Acquired
Autoimmune
Congenital
Graft vs. Host Disease
HIV/AIDS
Immune Suppression
Mixed Connective Tissue Disease
RA
Sepsis
SIRS
SLE
Therapeutic
Vasculitides

11. Acid-base and Electrolyte Abnormalities

**TAGS:**
Acid-base Abnormalities
Calcium
Chloride
Electrolyte Abnormalities
Magnesium
Metabolic
Mixed
Phosphorus
Potassium
Respiratory
Sodium

B. Critical Illness Diagnosis and Management

1. Central Nervous System

**TAGS:**
Abscess
Altered Mental Status
Angiography
Anticonvulsants
Antimicrobials
Brain Death
Coma
Critical Illness Polyneuropathy
Degenerative Disease of the Brain
Delirium
Demyelinating
Diagnoses
Diagnostic Modalities
EEG, Processed EEG
Embolic/Thrombotic
Encephalitis
Evoked Potential
Guillain-Barré Syndrome
Hallucinations
Head Injury, Closed or Open
Hemorrhagic (Subarachnoid, Subdural, Epidural Hematoma)
ICP Measurement
ICP-Controlling Medications
Infectious
Interventional Radiology
Ischemic
Jugular Venous Saturation
Lumbar Puncture
Management Strategies
Meningitis/Ventriculitis
Myasthenia Gravis
Myopathy
Nerve Conduction Studies/EMG
Neuromuscular Disorders
Neuroprotectants
Nuclear Medicine Studies
Other Imaging
Other Therapies
Pituitary Disorders
Plasmapharesis/Plasma Exchange
Seizures and Status Epilepticus
Spinal Cord Injury
Steroids
Stroke
Subarachnoid, Subdural, Epidural Hematoma
Surgical Interventions
Transcranial Doppler
Vascular Malformations
Vasoactive Drugs

2. Cardiovascular

**TAGS:**
Acquired ASD, VSD
AICDs
Aneurysm, Abdominal
Aneurysms, Thoracic
Anticoagulants and Antithrombotics
Antidyssrhythmics
Antifibrinolytics
Antihypertensives
Antimicrobials
Antiplatelet Agents
Aortic
Arterial Pressure
Asystole
Atrial Flutter/Fibrillation
Biomarkers
Cardiac Contusion
Cardiac Output Monitoring
Cardiac Transplantation, Rejection, Complications
Cardiac Ultrasound (TTE, TEE)
Cardiogenic
Cardiomyopathy
Circulatory Support Systems
Congenital Heart Disease in Adults
Coronary Artery Disease, Myocardial Ischemia/Infarction
CT, MRI
CVP
Diagnoses
Diagnostic Modalities
Diastolic Dysfunction
Dissections
Distributive
ECG
ECMO
Eisenmenger Syndrome
Endocarditis
External Defibrillators
Heart Block
Hemodynamic Monitoring
Heparin
Heparinoids
Hypertension
Hypertrophic Cardiomyopathy (HOCM, ASH, IHSS)
Hypovolemic
Imaging
Infectious
Inotropes/Chronotropes/Lusitropes
Insufficiency
Interventional Imaging
Intraaortic Balloon Pump
Junctional or Nodal Rhythm
Left or Right Ventricular Assist Device
Left Ventricular
LMWH
Management Strategies
Mitrall
Myocardial Function/Dysfunction
Myocarditis
IX.B.2

Non-infectious Myocarditis
Nuclear Imaging
Obstructive
Other Bedside Ultrasound
Other Conduction Abnormalities
Other Myocardial
Pacemakers/Defibrillators
Papillary Muscle Dysfunction
Pericardial
Pericardial Effusion
Pericardiocentesis
Pericarditis
Peripheral Vascular Disease
Pulmonary Hypertension
Pulmonic Valve Disease
Pulseless Electrical Activity (PEA)
Regurgitation
Rhythm Disturbances
Right Ventricular
Shock States
Stenosis
Stress-Induced Cardiomyopathy
Structural
Stunned Myocardium
Supraventricular Tachyarrhythmias, Other
Systemic Hypertension
Systemic Oxygen Supply and Demand
Systolic Dysfunction
Tamponade
Tetralogy of Fallot
Thrombin Inhibitors
Thrombolytics
Transthoracic
Transvenous/Epicardial
Traumatic
Tricuspid Valve Disease
Unfractionated
Valvular
Vasoactive or Modulating Drugs
Vasoconstrictors
Vasodilators
Ventricular Tachycardia/Fibrillation
Warfarin

3. Pulmonary

**TAGS:**
Air
Airway Diseases
Airway Disruption
IX.B.3

Airway Pressure-Release Ventilation
Antimicrobials/Antivirals
ARDS
Arterial Blood Gas
Aspiration
Assist Control
BIPAP
Capnography
Chest Trauma
Chest X-ray
Community-acquired
CPAP
CT/MRI
Diagnoses
Diagnostic Modalities
Differential Lung Ventilation
Embolic Disorders
Empyema/Abscess
Fat
Health Care Associated
High-Frequency/Oscillation
Hypercapnic (Acute and Chronic)
Hypoxic (Acute and Chronic)
Imaging
Infection
Inflammatory and Autoimmune Diseases
Invasive Ventilation Modes
Laryngoscopy and Bronchoscopy
Lung and Chest Wall Tumors
Lung Transplantation, Rejection, Complications
Management of Bronchopleural and Bronchocutaneous Fistulae
Management Strategies
Mediastinitis
Noninvasive
Nuclear Studies
Obstructive
Other Ventilator Strategies
PC/Volume Control
Pleural Drainage and Evacuation
Pleural Effusion
Pneumonia
Positioning
Pressure-Support Ventilation
Pulmonary Function Studies/Pulmonary Mechanics
Pulmonary Medications
Pulse Oximetry
Reactive
Respiratory Failure
4. Renal

**TAGS:**
- Angiography
- Antimicrobials/Antifungals
- Biomarkers
- Buffers
- Continuous Renal Replacement Therapies Including Ultrafiltration
- Contrast Induced-Nephropathy
- CT/MRI
- Diagnoses
- Diagnostic Modalities
- Diagnostic X-ray
- Diuretic Therapy
- Electrolytes, Osmolarity, and Specific Gravity (Serum, Urine)
- Fluid and Electrolyte Management
- Imaging
- Infection
- Intermittent Hemodialysis
- Intrinsic Renal Management Strategies
- N-Acetylcysteine
- Peritoneal Dialysis
- Pharmacologic Therapies
- Post-Renal
- Pre-Renal
- Renal Biopsy
- Renal Failure
- Renal Replacement Therapies
- Renal Transplantation
- Renal Trauma
- Renal Tubular Acidosis
- Ultrasound

5. Hematologic/Oncologic

**TAGS:**
- Acquired
Anemia
Anticoagulants
Antiplatelet Agents
Bone Marrow Biopsy, Culture
Bone Marrow/Stem Cell Transplantation, Rejection, Complications
Carboxyhemoglobin
Coagulation Studies
Coagulopathies
Congenital
Diagnoses
Diagnostic Modalities
DIC
Erythropoietin, GCSF
Fibrinolysis
Hemoglobin Abnormalities
Heparin
Heparinoids
Hypercoagulable State
Isolated Factor Abnormalities
IVC Filters, Other Mechanical Devices
Leukemia, Lymphoma
LMWH
Management Strategies
Methemoglobin
Other Hemoglobinopathies
Plasmapheresis/Plasma Exchange
Platelet Abnormalities
Polycythemia
Reversal Agents
Routine Blood Studies
Thrombin Inhibitors
Thrombocytopenia (Including HIT)
Thrombocytosis
Thrombolytics
Transfusion and Factor Replacement
Tumor Lysis Syndrome
Unfractionated
Vitamin K Dependent
Warfarin
White Blood Cell Disorder

6. Obstetric

TAGS:
Anticoagulants
Anticonvulsants
Antihypertensive therapy
Antimicrobials
Cardiotocography
Coagulopathy, Bleeding Disorders
Delivery
Diagnoses
Diagnostic Modalities
Emboli (Amniotic Fluid, Thromboemboli, Other)
Laboratory Studies (Serum, Urine)
Liver Function Abnormalities
Management Strategies
Peripartum Infection
Pre-Eclampsia/Eclampsia
Ultrasound

7. Endocrine

**TAGS:**
Adrenal
Adrenal Insufficiency
Antihypertensives
Cerebral Salt Wasting
Critical Illness Effects on Thyroid Function
CT
Cushing Syndrome
Diabetes Insipidus Including Central, Nephrogenic
Diabetes Mellitus
Diagnoses
Diagnostic Modalities
Glucose Management
Hormone Replacement Therapy
Hyperglycemia, Diabetic Ketoacidosis (DKA), Non-Ketotic Hyperglycemic Coma (NKHC)
Hyperthyroidism, Including Thyroid Storm
Hypoglycemia
Hypothyroidism, Including Myxedema
Insulin
Laboratory Studies (Serum, Urine)
Management Strategies
Oral Hypoglycemic Agents
Other Therapies
Pheochromocytoma
Pituitary
SIADH
Steroids (Glucocorticoid and Mineralocorticoid)
Thyroid Function Abnormalities
Ultrasound
Vasodilators
Vasopressins/DDAVP

8. Gastrointestinal

**TAGS:**
Abdominal Compartment Syndrome
Abdominal Pressure Measurement
Additional Relevant Studies
Antimicrobials
Assessment of Bowel Motility
Blood Product Selection and Administration
Bowel Disorders
Coagulation Parameters
CT
Diagnoses
Diagnostic Modalities
Diuretics, Renal Replacement Therapies
Dysfunction/Failure, Acute and Chronic
Endoscopy, Upper, Lower
Endoscopy, Upper, Lower with Therapeutic Intervention
Endoscopy, Upper, Lower; ERCP
Gall Bladder Disease (Stones, Cholecystitis)
Gastritis
GI Blood Flow Modulators
GI Hemorrhage
GI Motility Dysfunction, GERD
Hepatic
Hepatic Encephalopathy
Hepatitis
Hepatocellular Carcinoma
Hepatorenal Syndrome
Imaging
Immunologic Studies
Immunologic Therapy, Steroids
Immunotherapy
Interventional Radiology
Interventional Radiology (Embolization, Coiling)
Laboratory Studies
Lactulose, Rifaximin
Liver Transplantation, Rejection, Complications
Lower
Management of Increased Intracranial Pressure
Management Strategies
MRI
Nuclear Medicine Studies
Nutritional Assessment (Albumin, Prealbumin)
Nutritional Support (Enteral, Parenteral)
Pancreas
Pancreatic Cancer
Pancreatitis
Paracentesis, Diagnostic
Paracentesis, Therapeutic
Pharmacologic Management
Routine Blood Studies (CBC, Electrolytes, Renal Function)
Serology (Hepatitis, HIV)
Stomach
Stool Assessment (Occult Blood, C. Diff Toxin)
Surgical Intervention (Timing, Therapeutic Options)
Ulcer
Ultrasound
Upper
Urine Electrolytes (Fractional Excretion of Sodium)
Vaccination
X-ray

9. Dermatologic

**TAGS:**
Allergic Reactions
Antimicrobials, Antihistamines
Biopsy (with Culture and Appropriate Stains)
CBC with Differential
Cellulitis
Diagnoses
Diagnostic Modalities
Disruption of the Skin Barrier
Immunologic Studies
Infection
Inflammatory Diseases of the Skin
Laboratory Studies
Management Strategies
Medication Review
Necrotizing Fasciitis
Other Immunotherapies
Other Topical Medications
Pharmacologic
Sedimentation Rate
Steroids, Systemic and Topical
Stevens Johnson Syndrome
Wound Care (Surgical and Other)

10. Immune/Infectious Disease

**TAGS:**
Acquired
Antimicrobials (Including Prophylaxis)
Autoimmune
Biomarkers
Biopsy, Selective Aspiration
Congenital
Cultures
Diagnoses
Diagnostic Modalities
Graft vs. Host Disease
HAART
HIV/AIDS
Immune Suppression
Immunologic Studies
Laboratory Studies
Management Strategies
Mixed Connective Tissue Disease
Neutropenia
Pharmacologic
RA
Routine (CBC, etc.)
Sepsis
Serologies
SIRS
SLE
Steroids
Vasculitides

11. Acid-base and Electrolyte Abnormalities

TAGS:
Acid-base Abnormalities
Albumin
Appropriate Renal and Endocrine Strategies
Arterial Blood Gas
Calcium
Chloride
Diagnoses
Diagnostic Modalities
Electrolyte Abnormalities
Electrolyte Replacement as Appropriate
Electrolytes, Osmolarity, and Specific Gravity (Serum, Urine)
Laboratory Studies
Magnesium
Management Strategies
Metabolic
Mixed
Phosphorus
Potassium
Respiratory
Selective Imaging
Sodium
Ventilatory Support

C. Specialized Areas

1. Biostatistics

TAGS:
Chi Squared
Kaplan Meier
Meta Analysis
Number Needed to Treat
Odds Ratio
Propensity Score
Regression Analysis
Relative Risk
ROC
Sample Size Estimate
Sensitivity, Specificity
Statistical Significance (P-Value)
Study Design

2. Burns
   TAGS:
   Airway Management
   Antimicrobials
   Complications
   Electrical Burns
   Fluids and Resuscitation
   Inhalation Injury
   Management
   Other Therapies (Hyperbaric, Pharmacologic, Surgical)

3. Disaster Management
   TAGS:
   Biologic, Chemical, and Nuclear Exposures
   Epidemic

4. Drowning, Fatal, Near-drowning
   TAGS:
   Fresh Water
   Salt Water

5. ICU Ethics
   TAGS:
   Brain Death
   End-of-Life, Futility
   Impaired Providers
   Informed Consent
   Living Will/DPOA/Healthcare Surrogate
   Organ Donation
   Palliative Care, Hospice
   Patient Autonomy

6. ICU Management and Organization
   TAGS:
   Clinical Care Bundles
   Compliance
   Daily Wake-Up Test
   Handover/Communication
   HIPAA (Privacy and Security)
   ICU Transport
   Outcome and Performance Measures (HCAPS)
   QA/QI (Patient Safety)
   Regulatory Requirements
   Scoring Systems
   Sedation/Analgesia/Delirium Assessment
   Triage and Resource Utilization

7. Infection Control
   TAGS:
Blood and Body Fluid Exposure
Catheter Associated Infections
Environmental Exposures
General/Universal Precautions
Isolation Techniques
Nosocomial Infections
Pneumonia (Ventilator Associated, Hospital Associated, Etc.)
Preparation Techniques
Reverse Isolation
Specific Isolation Procedures
UTI, Catheter-Associated UTI

8. Life Support and Resuscitation
**TAGS:**
ACLS
Other

9. Nutrition Management
**TAGS:**
Enteral and Parenteral Nutrition (Formula, Caloric Intake)
Enteral Tubes
Re-feeding Syndrome

10. Assessment and Management of Pain, Sedation, and Delirium
**TAGS:**
Multimodal Analgesia
Opiate Management
Regional Analgesia Techniques
Sedation/Analgesia/Pain/Delirium Assessment

11. Pharmacology (Indications, Contraindications, and Complications)
**TAGS:**
Anaerobes
Antibiotics
Antidepressants
Antifungal
Antimicrobial Resistance
Antimicrobials
Antiparasitic
Antipsychotics
Antiviral
Genetic Considerations
Gram-Negative Organisms
Gram-Positive Organisms
Lithium
Neuromuscular Blocking Drugs
Pharmacokinetics and Pharmacodynamics and Drug Metabolism
Prophylactic Antimicrobials
Sedatives/Hypnotics
Spirochetal and Rickettsial
SSRIS
TB
Tricyclic Antidepressants

12. Poisonings, Toxic Ingestion, Overdoses, and Withdrawal

13. Procedures

**TAGS:**
- Airway
- Arterial
- Chest Tubes
- Complications
- Indications, Application
- Interpretation
- Intraosseous
- LMA/Others
- Monitoring Techniques and Troubleshooting
- Physics of Ultrasound
- Tracheostomy
- Ultrasound
- Vascular Access
- Venous

14. Thermoregulation

**TAGS:**
- Environmental
- Fever
- Heat Stroke
- Hyperthermia
- Hypothermia
- Malignant Hyperthermia
- Neuroleptic Malignant Syndrome
- Therapeutic

X. PAIN MEDICINE

A. General

1. Anatomy and Physiology: Mechanisms of Nociceptive Transmission

**TAGS:**
- Peripheral Mechanisms
- Central Mechanisms: Spinal and Medullary Dorsal Horns
- Central Mechanisms: Segmental and Brain Stem
- Central Mechanisms: Thalamocortical

2. Pharmacology of Pain Transmission and Modulation

**TAGS:**
- Central and Peripheral Sensitization: Mechanisms and Implications for Treatment of Pain
- Neurotransmitters Involved in Pain Modulation
- Peripheral Mechanisms of Pain Transmission and Modulation
- Synaptic Transmission of Pain in the Dorsal Horn

3. Designing, Reporting, and Interpreting Clinical Research Studies about Treatments for Pain: Evidence-Based Medicine

**TAGS:**
- Cohort Studies: Use to Determine Natural History and Predictors of Outcome
- Components of Clinical Trials
Critical Analysis of Literature and Evidence-Based Medicine: Basic Concepts
Effects of Analysis on the Clinical Applicability of Study Results
Ethical Standards of Research Design, Review and Implementation, Informed Consent
Principles of Valid Clinical Research
Observational Studies: Uses and Limitations (e.g., Measurement of Strength of Association Between Risk Factors and Pain); Known Major Risk Factors for Development of Chronic Pain
Special Features of Study of Pain
Use of Data from Epidemiologic Studies of Pain
Use of Risk Factors to Guide Treatment

4. Ethical Standards in Pain Management

TAGS:
Boundary Issues (e.g., Inappropriate Prescribing, Overfamiliarity with Patients)
Documentation Including Appropriate Coding and Billing
Ethics of Pain Management
Informed Consent
Professionalism
Quality Assurance
Managing Difficult and Disruptive Patients, Including Safety in the Workplace

5. Factors Complicating the Treatment Chronic Pain

TAGS:
Obesity
Sleep Disorders
Tobacco Use and Abuse

B. Assessment and Psychology of Pain

1. Assessment and Psychology of Pain

TAGS:
Direct Pain Measurement: Self-Report
Indirect Pain Measurement: Observations
Introspection and Measurement of Subjective Experience: Basic Concepts
Outcome Measures in Clinical Studies: Basic Issues
Outcomes Measures in Studies of the Impact of Pain: Requirements
Pain as a Subjective, Multidimensional Experience

2. Placebo and Pain

TAGS:
Ethics of Placebo in Clinical Trials and Clinical Practice
Nocebo Effect
Placebo as Treatment Modality
Placebo Response: Mechanisms and Interpretation
Placebo: Definition and Incidence

3. Clinical Nerve Function Studies and Imaging

TAGS:
EEG, MEG: Uses
Electrical Nerve Stimulation EMG/NCV/Evoked Potentials): Uses and Limitations
MRI, FMRI, and MR Spectroscopy: Uses
PET Scans: Uses
Quantitative Sensory Testing: Uses and Limitations
Skin Punch Biopsy: Assessment of Innervation Density

4. Psychosocial and Cultural Aspects of Pain

**TAGS:**
Common Emotional Problems and Psychiatric Disorders Associated with Pain
Coping Styles: Definition and Effect on Pain Experience and Response to Treatment
Cultural, Environmental, and Racial Variations in Experience and Expression of Pain
Expectations, Coping, Cultural and Environmental Factors: Effect on Disability,
Treatment Outcome, Maintenance of Treatment Effects
Individual Differences in Affective, Cognitive, and Behavioral Responses to Pain
Pain as a Biopsychological Experience: Definition and Measurement
Role of Care Givers in Promoting Illness and Well Behavior

5. Sex, Gender and Race Issues in Pain

**TAGS:**
Analgesic Response: Differences Between Sexes and Within the Same Sex (e.g., Child Bearing)
Definition of Sex and Gender
Sex Differences: Biologic and Psychosocial Contributions to Pain Response
Sex Differences: Role in Epidemiology of Pain in Relation to Age and Reproductive History
Sex Differences: Role in Treatment Seeking, Delivery and Effectiveness of Treatment

C. Treatment of Pain: Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, and Indications/Contraindications

1. Opioids

**TAGS:**
Differential Response, Opioid-Induced Hyperalgesia
Federal Regulations Regarding Prescribing of Controlled Substances
Opioid Metabolism, Genetic Variability
Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, and Indications/Contraindications
Pharmacology of Buprenorphine and Methadone
Pharmacology of Pain Transmission and Modulation
Risk Assessment and Management of the Patient on Chronic Opioid Therapy

2. Antipyretic Analgesics: Nonsteroidals, Acetaminophen, and Phenazone Derivatives

**TAGS:**
Adverse Effects
Drug Interactions
Indications/Contraindications
Pharmacodynamics
Pharmacokinetics

3. Antidepressants and Anticonvulsants

**TAGS:**
Anticonvulsants: Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, Indications/Contraindications
Antidepressants: Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, Indications/Contraindications

D. Treatment of Pain: Other Methods

1. Psychological Treatments (Cognitive-Behavioral and Behavioral Interventions)

TAGS:
Cognitive and Behavioral Strategies: Application to Specific Pain Syndromes (e.g., TMJ Pain, Neck and Back Pain, Fibromyalgia, Arthritis Pain, Burn Pain, Postoperative Pain)
Integration of Approaches: Cognitive Behavioral Treatments, Combined Behavioral and Drug Treatments; Economic Benefits of Integrating Treatment

2. Psychiatric Treatment

TAGS:
Anger in Chronic Pain Patients and Relation to Perceived Pain
Differential Diagnosis of Anxiety Disorders That May Augment Pain and Suffering
Opioids in Chronic Noncancer Pain: Use in Persons with Substance Use Disorders; Addiction Vs Pharmacological Tolerance; Withdrawal Symptoms; Role of Buprenorphine
Pharmacotherapy for Treatment of Comorbid Conditions: Antidepressants, Mood-Stabilizing Agents, Anxiolytics, Antipsychotics
Psychiatric and Psychologic Morbidities of Chronic Pain (e.g., Depressive Disorders, Anxiety Disorders, Substance-Related and Addictive Disorders, Somatic Symptom and Related Disorders, Bipolar and Related Disorders)
Psychiatric and Psychological Factors That Impact Treatment Adherence and the Therapeutic Alliance with Treatment Providers (e.g., Psychological Factors Affecting Other Medical Conditions)
Psychotherapy for Depressive Disorders: Cognitive Behavioral, Marital, Family, Interpretive, Group Therapy
Role of Family and Other Caregivers: Importance of Interviewing and Training Patient and Relatives; Evaluating Information from Relatives
Role of Patient Beliefs and Expectations in Pain and Disability; Coping Strategies
Sleep Disorders in Chronic Pain; Diagnosis and Evaluation
Somatic Complaints in Chronic Pain: Conversion (Functional Neurological Symptom) Disorder, Somatic Symptom Disorder and Illness Anxiety Disorder
Work History and Education in Evaluation of Chronic Pain

3. Stimulation-Produced Analgesia

TAGS:
Clinical Applications and Efficacy
Indications, Risks, Associated Complications
Postulated Mechanisms
Stimulation Techniques (TENS, Vibration, Peripheral Nerve Stimulation, Spinal Cord Stimulation)

4. Interventional Pain Management Including Nerve Blocks and Lesioning

TAGS:
- Anatomy
- Image Guided Injection Techniques (e.g., Ultrasound, Fluoroscopy, CT)
- Intrathecal Drug Delivery: Indications, Risks, Associated Complications
- Joint, Bursa, Soft Tissue Injections: Clinical Indications, Risks, Associated Complications
- Management of Anticoagulation
- Neuraxial Injections: Clinical Indications, Risks, Associated Complications
- Neurolytic Blocks: Indications, Risks, Associated Complications
- Peripheral Nerve Blocks: Clinical Indications, Risks, Associated Complications
- Pharmacology and Use of Drugs
- Radiofrequency Treatment: Indications, Risks, Associated Complications
- Sympathetic Nerve Blocks: Clinical Indications, Risks, Associated Complications

5. Physical Medicine and Rehabilitation

TAGS:
- Casting and Splinting
- Exercise Therapy
- Manipulation, Mobilization, Massage, Traction
- Other-Treatment of Pain (Methods): Physical Medicine and Rehabilitation
- Temperature Modalities (e.g., Heat, Cold, Ultrasound)

6. Work Rehabilitation

TAGS:
- Components of Successful Comprehensive Rehabilitation Program (General Exercise, Cognitive Therapy, Vocational Elements)
- Functional Capacity Evaluation: Definition, Usefulness, and Limitations
- Identification of Obstacles to Recovery (e.g., Fear of Reinjury, Low Expectations of Recovery, Low Mood, Anxiety, Withdrawal from Social Interaction); Reliance on Passive Treatments; Negative Attitude to Physical Activity and Self-Management
- Importance of Early Intervention and Early Return to Work in Reducing Absence
- Psychosocial Factors as the Main Determinants of Disability and as Predictors of Prolonged Work Absence
- Work Rehabilitation

7. Complementary Therapies (CAM)

TAGS:
- Alternative Medical Systems (e.g., Traditional Eastern Medicine, Homeopathy, Acupuncture, Acupressure)
- Biologically Based Therapies (e.g., Herbs, Foods, Vitamins)
- Energy Therapy
- Evidence Base
- Implications, Costs and Side Effects (Including Drug Interactions)
- Manipulative Methods (e.g., Osteopathy, Chiropractic)
- Mind-Body Interventions (e.g., Yoga, Mindfulness, Meditation, Tai Chi)
- Prevalence and Patient Reasons for Use

E. Tissue Pain

1. Acute Pain

TAGS:
Clinical Outcomes to Be Evaluated in an Organized Approach to Acute Pain Management

Employing Multimodal Analgesia for Optimal Perioperative Pain Management:
- Formulation Based On Type and Cause of Pain, Patient Preference, Physical and Mental Status, and Available Expertise and Technology

Epidemiology of Inadequate Control of Acute Pain

Nonpharmacologic Treatment

Perioperative Management of the Patient with Chronic Pain

Pharmacologic Properties of Major Classes of Drugs Used for Acute Pain Management

Physiologic and Psychologic Effects: Identification and Control

Treatment of Acute Pain in the Opioid Tolerant Patient

Treatment of Nonsurgical Pain (e.g., Burns, Sickle Cell Disease)

2. Cancer Pain

TAGS:
- Analgesic Approach; Indications, Pharmacologic Properties, Therapeutic Guidelines, Adverse Effects of Opioids and Other-Analgesics, Including Drugs for Neuropathic Pain
- Anesthetic Approaches: Indications, Risks, Practical Implications
- Comprehensive Evaluation of Patients with Cancer Pain: Needs and Approach
- Needs of Special Populations: Children, Patients with Learning Disabilities; Older Adults
- Pain Treatment in the Cancer Patient with Coexisting Substance Use Disorder or Other Psychiatric Disorder
- Palliative Care: Definition and Scope; Frequency of Pain and Multiple Sites of Pain, Barriers to Treatment, Importance of Development of Evidence-Based Practice in the Management of Cancer Pain
- Physical Therapy: Usefulness
- Principles of Treatment, Including Treatment of Underlying Disease, Analgesic Pharmacotherapy; Integration of Other-Modalities (e.g., Physical, Psychological, and Anesthetic)
- Psychological Approaches: Usefulness
- Surgical and Interventional Approaches: Indications, Risks, Practical Implications

Treatment of Persistent Pain in Cancer Survivors

3. Cervical Spinal Pain

TAGS:
- Anatomy
- Causes and Differentiation from Neck Pain and Somatic Nerve Pain
- Electrodiagnostic Studies: Reliability and Validity
- Evidence for Commonly Used Treatments
- History Taking and Neurologic Examination: Role and Limitations
- Injection Therapy: Indications, Use, and Complications
- Medical Imaging: Reliability and Validity
- Natural History and Relevance to Management, Including Whiplash Injury
- Nonsurgical Intervention: Evidence for Efficacy of Reassurance, Maintaining Activity, and Exercises
- Surgical Treatment: Indications and Use, Including Indications for Urgent Surgical Referral

4. Lumbar Spinal Pain

TAGS:
Anatomy
Differentiation of Low Back Pain and Referred Somatic Pain from Radicular Pain, Radiculopathy, and Sciatica; Relevance to Investigation and Treatment
Electrodiagnostic Studies: Reliability and Validity
Etiologic and Prognostic Risk Factors: Differences, Clinical Significance, and Use
History Taking: Significance and Use
Interventions Commonly Used for Acute and Chronic Low Back Pain: Evidence for Efficacy
Invasive Tests (e.g., Diagnostic Joint Blocks, Diskography): Use
Medical Imaging: Reliability and Validity
Multidisciplinary Therapy: Use and Limitations
Natural History
Nonsurgical Intervention: Evidence for Efficacy of Reassurance, Maintaining Activity, and Exercises
Physical Examination
Psychosocial and Occupational Factors Related to Low Back Pain and Chronicity
Surgical Treatment, Including Indications for Urgent Surgical Referral
5. Musculoskeletal Pain
TAGS:
Anatomy and Biomechanics of Joints and Muscles
Anatomy and Physiology
Autoimmune and Rheumatic Disorders Including Assessment of Activity and Severity of Rheumatic Disease
Classification and Clinical Characteristics of Musculoskeletal Diseases
Diagnostic Labels for Muscle Pain: Myalgia, Nonskeletal Musculoskeletal Pain, Chronic Regional Pain, Regional Soft-Tissue Pain, Myofascial Pain, Fibromyalgia, Spasticity, and Myopathies
Epidemiology
Mediators of Inflammation, Tissue Destruction, and Repair
Treatment and Rehabilitation of Musculoskeletal Pain/Disability
F. Visceral Pain
1. Chronic Abdominal Pain
TAGS:
Anatomy: Organization of Peripheral and Central Visceral Innervation, Properties of Visceral Nociceptors, and Mechanisms of Visceral Nociceptor Sensitization
Clinical Differentiation of Gastrointestinal, Urologic, Gynecologic, and Musculoskeletal Pain
Diagnostic Evaluation and Treatment
Distinct Clinical Features, e.g. Chronic Pancreatitis, Irritable Bowel Syndrome, Inflammatory Bowel Disease, Functional Abdominal Pain
Epidemiology
Psychological Principles in Clinical Assessment, Explanation, and Treatment
2. Chronic Pelvic Pain
TAGS:
Anatomy
Epidemiology
Clinical Differentiation of Gastrointestinal, Urologic, Gynecologic, and Musculoskeletal Pain
Common Causes, Diagnostic Evaluation, and Treatment in Men
Common Causes, Diagnostic Evaluation, and Treatment in Women
Psychological Principles in Clinical Assessment, Explanation, and Treatment

G. Headache and Facial Pain

1. Headache

   TAGS:
   Anatomy and Physiology
   Diagnosis and Management of Post Dural Puncture Headache
   Headache: Indications for Further Investigation of Headache
   Internationally Accepted Diagnostic Criteria for Classification of Headache Disorders
   Major Hypotheses about Mechanisms
   Pharmacologic Treatment and Alternatives
   Physical, Psychological, and Social Factors Contributing to Headache; Role of Counseling and Other - Nonpharmacologic Treatment, e.g. Botulinum Toxin
   Role of Medication Overuse
   Systematic Case History, Use of Headache Diary, Selection of Appropriate Examination Based on History

2. Orofacial Pain (e.g., Trigeminal Neuralgia, Post Herpetic Neuralgia, Atypical Facial Pain)

   TAGS:
   Anatomic, Physiologic, Psychosocial Aspects
   Evidence-Based Treatment Options
   History Taking, Physical Examination, and Diagnostic Studies

H. Neuropathic pain

1. Peripheral Neuropathic Pain (e.g., Diabetic Peripheral Neuropathy, Post Herpetic Neuralgia, Peripheral Nerve Injuries)

   TAGS:
   Clinical Characteristics
   Common Neuropathic Pain Syndromes: Differential Diagnosis, Natural Course
   Pathologic Mechanisms in Nervous System Diagnostic Studies: Clinical, Electrodiagnostic, Laboratory, and Radiographic Findings
   Definition
   Epidemiology
   Therapeutic Modalities: Pharmacologic, Interventional, Rehabilitative

2. Central Pain Syndromes (e.g. Post Stroke Pain, Phantom Limb Pain, Pain after Spinal Cord Injury)

   TAGS:
   Clinical Characteristics
   Common Central Pain Syndromes: Differential Diagnosis, Natural Course
   Definition
   Diagnostic Studies: Clinical, Electrodiagnostic, and Radiographic Findings
   Epidemiology
   Pathologic Mechanisms in Nervous System
   Therapeutic Modalities: Pharmacologic, Interventional, Rehabilitative

3. Complex Regional Pain Syndromes

   TAGS:
   Definition
   Diagnostic Studies
   Epidemiology
Pathophysiologic Mechanisms
Therapeutic Modalities: Pharmacologic, Interventional, Rehabilitative

I. Special Cases

1. Pain in Children and Adolescents
   
   **TAGS:**
   - Acute and Chronic Pain in Children and Adolescents: Special Considerations in Management/Palliative Care
   - Ethics of Treatment of Pain in Children and Adolescents
   - Factors Affecting Pain Perception in Children and Adolescents (e.g., Development Level, Family Beliefs, Past Pain Experience, Abuse/Trauma)
   - Pain Assessment Tools in Children and Adolescents: Use and Limitations
   - Pain Syndromes Commonly Seen in Children and Adolescents (e.g. Functional Abdominal Pain, Sickle Cell Disease, Muscle Skeletal Pain, Headache)
   - Treatment of Pain in Children and Adolescents: Pharmacologic and Nonpharmacologic (e.g., Counseling, Guided Imagery, Hypnosis, Biofeedback)

2. Pain in Older Adults
   
   **TAGS:**
   - Access to Care
   - Age-Related Changes in Pharmacology (e.g. Drug-Drug Interactions, Clearance, Coexisting Disease)
   - Epidemiology
   - Ethics of Treatment of Pain in Older Adults
   - Heterogeneity in Physiologic, Psychological, and Functional Capacity of Persons of the Same Chronologic Age
   - Issues Related to Age Differences
   - Pain Assessment: Limitations

3. Pain Issues in Individuals with Limited Ability to Communicate Due to Neurocognitive Impairments
   
   **TAGS:**
   - Conditions Leading to Limitations in Ability to Communicate
   - Difficulties in Assessment and Treatment of Pain
   - Role of Caregivers and Social Context in Assessment and Treatment of Pain

4. Pain Relief in Persons with Substance Use Disorders
   
   **TAGS:**
   - Acute Pain Management of Patients with Substance Use Disorder
   - Biopharmacologic and Neurophysiologic Basis of Addiction
   - Interpretation of Drug Toxicology Testing
   - Legal and Regulatory Issues When Prescribing Controlled Substances to Patients with Pain and Substance Use Disorder
   - Pharmacologic Treatment of Patients with Substance Use Disorder
   - Principles of Comprehensive Approach to Pain Management in Patients with Substance Use Disorder
   - Recognition of Aberrant Drug-Related Behavior Including Diversion and Misuse
   - Risks and Benefits of Opioid Use in Treatment of Chronic/Cancer Pain in Patients with Substance Use Disorder
   - Screening and Referral for Substance Use Disorder in Patients with Pain

5. Chronic Pain in Pregnancy and Lactation
XI. PEDIATRIC ANESTHESIOLOGY

A. Basic Science

1. Anatomy

TAGS:
Airway
Airway Management
Anatomy for Procedures
Atresias, Stenoses and Webs
Body Habitus
Central Neuraxial Blockade
General Development
Peripheral Nerve Blockade
Vascular Cannulation
Water, Volume, and Blood Composition

2. Physics and Anesthesia Equipment

TAGS:
Brain, Spinal Cord, and Neuromuscular Function
Breathing Circuits
Cardiac Rhythm and Vascular Pressures
Methods for Monitoring
Oxygenation, Gas Concentration, and Ventilation
Point-of-Care Ultrasound
Respiration
Temperature
Ventilation Devices and Techniques

3. Anesthetic Pharmacology: Physiologic States, Pathophysiologic States and Adverse Effects

TAGS:
Agents Affecting Coagulation
Anti-Emetics
Biotransformation and Excretion
Blood-Brain Barrier
Drug Absorption
Drug Distribution
Inhalation Anesthetics
Local Anesthetics
Neuromuscular Blocking and Reversal Agents
Non-Opioid Analgesics
Opioid Analgesics
Pharmacogenetics
Pharmacokinetics and Pharmacodynamics
Sedative and Anxiolytic Agents
Sympathetic and Parasympathetic Agents

B. Organ-Based Basic and Clinical Sciences
1. Respiratory System

**TAGS:**
- Anatomy and Physiology
- Anesthesia for Thoracic Procedures
- Chest Wall Surgery/Reconstruction
- Clinical Sciences
- Congenital Pulmonary Airway Malformation (CPAM)
- Lung Physiology
- Mediastinal Masses
- Musculoskeletal
- Obstructive Disease
- One Lung Ventilation
- Oxygen Transport
- Parenchymal
- Pleural
- Prenatal and Postnatal Development
- Respiratory Mechanics, Ventilation, and Lung Volumes
- Restrictive Disease
- Surfactant and Surface Tension
- Tracheobronchial
- Upper Airway
- Ventilation/Perfusion Matching
- Video-Assisted Thoracoscopy

2. Cardiovascular System

**TAGS:**
- Acyanotic Lesions
- Anatomy and Physiology
- Anesthesia for Cardiac Patients
- Anesthesia for Diagnostic, Interventional and Electrophysical Procedures
- Anesthesia in Patient with Pacemaker or AICD
- Anesthetic Effects on the Cardiovascular System
- Arrhythmic Lesions
- Cardiomyopathies
- Cardiopulmonary Resuscitation and PALS
- Cardiovascular Effects on Anesthetic Uptake and Delivery
- Clinical Science
- Cyanotic Lesions
- Disease States
- Fetal, Transitional, and Adult Circulation
- General Considerations
- Heart Transplantation
- Infectious Diseases
- Intracardiac Masses
- Palliative Procedures
- Pericardial Disease
- Prenatal and Postnatal Development
- Pulmonary Hypertension
- Vasoactive Medications
3. Central and Peripheral Nervous Systems

**TAGS:**
- Anatomy and Physiology
- Anesthesia for Neurosurgical Procedures
- Clinical Science
- Craniofacial Reconstruction/Cranioplasty
- EEG Changes
- General Considerations
- Intracranial Pressure and Blood Flow
- Intracranial Tumors and Vascular Lesions
- Meningomyelocele/Spinal Surgery
- Myelinization, Autonomic Nervous Systems, and Pain Pathways
- Neurocognitive and Behavioral Changes after Anesthesia
- Neurologic Imaging
- Pharmacology of Diuretics, Steroids, and Anticonvulsant Medications
- Prenatal and Postnatal Development
- Preoperative Anxiety, Postoperative Behavior, and Emergence Delirium
- Seizure Surgery
- Serotonin Syndrome
- SMART Tots Consensus Statement And Animal Studies

4. Gastrointestinal System

**TAGS:**
- Abdominal Wall Defects
- Atresias, Stenoses and Webs
- Clinical Science
- Esophageal/Gastrointestinal Foreign Bodies
- Esophageal, Stomach and Intestine Disorders
- Hernias
- Liver, Biliary Tract and Spleen Disorders
- Morbid Obesity/Bariatric Surgery
- Necrotizing Enterocolitis

5. Renal/Urinary

**TAGS:**
- Clinical Science
- Prenatal and Postnatal Development
- Renal Failure

6. Endocrine/Metabolic

**TAGS:**
- Adrenal Disorders
- Clinical Science
- Diabetes Insipidus
- Diabetes Mellitus
- DiGeorge Syndrome
- Disorders of Sodium Regulation
- Pheochromocytoma
- Thyroid Disorders

7. Hematology/Oncology

**TAGS:**
- Anemias
- Anterior Mediastinal Mass
- Bone Marrow and Stem Cell Transplants
Chemotherapeutic Agents and Side Effects
Clinical Science
Coagulation Disorders
Hematology
Oncology
Radiation Therapy
Sickle Cell Disease
Tumor Lysis Syndrome

8. Genetics
Clinical Sciences
Craniofacial Syndromes
Genetic Abnormalities
Inborn Errors of Metabolism
Malignant Hyperthermia
Mitochondrial Myopathies
Muscular Dystrophies
Myopathic Disorders and Myotonias
Osteochondrodysplastic Syndromes
Skin and Connective Tissue Disorders
Trisomy 21

C. Clinical Subspecialties
1. Neonatal
TAGS:
Apnea and Bradycardia
Clinical Science
Congenital Cystic Adenomatoid Malformation
Congenital Diaphragmatic Hernia
General Considerations
Medical Disease States
Neonatal Resuscitation
Retinopathy of Prematurity
Surgical Disease States

2. Painful Disease States
TAGS:
Chronic Pain States
Pathophysiology
Pharmacologic and Non-Pharmacologic Techniques of Pain Management
Regional Analgesia
Treatment

3. Otolaryngology
TAGS:
Airway Procedures
Bronchoscopic Procedures
Choanal Atresia Repair
Cochlear Implant, Tympanoplasty, and Mastoidectomy
Laser Procedures
Myringotomy and Tubes
Obstructive Sleep Apnea (OSA)
Otologic Procedures
Tonsillectomy, Adenoidectomy, and Abscess Drainage
Tracheotomy

4. Plastic and Oral-Maxillary Facial Surgery
TAGS:
Cleft Repairs
Clinical Science
Mandibular Repairs
Vascular Malformations

5. Ophthalmology
TAGS:
Clinical Science
General Considerations
Pharmacology of Ophthalmologic Medications
Strabismus Repair
Trauma

6. Orthopedic Surgery
TAGS:
Anterior, Posterior, and Combined Spine Fusion
Clinical Science

7. Trauma and Burns
TAGS:
Anesthetic and Pain Management of the Burn Patient
Burns
Dressing Changes
Fluid Resuscitation and Calculating Burn Surface Area
Hypothermia and Submersion Injury
Incidence, Patterns, Implications of Abuse
Inhalation Injuries/Airway Management
Management of the Polytrauma Victim
Trauma
Types, Mechanisms, Locations and Implications of Injuries

D. Clinical Science of Anesthesia

1. Evaluation and Preoperative Preparation of the Pediatric Patient (See Specific Disease States)
TAGS:
Autism Spectrum Disorders
Concussion
Evaluation of Coexisting Disease
Fasting Requirements
General Considerations
Informed Consent
Laboratory Testing
Normal Developmental Milestones
Parental Presence and Pharmacologic Preparation for Anesthetic Induction
Physical Examination
Psychosocial Preparation of the Patient and Family
Upper Respiratory Tract infections
2. General Considerations of the Perioperative Period
   \textbf{TAGS:}
   
   Fluid, Electrolyte, and Glycemic Management
   Thermoregulation
   Transfusion Therapy and Blood Conservation Techniques

3. Regional Anesthesia and Analgesia
   \textbf{TAGS:}
   
   Central Neuraxial Blockade: Indications, Contraindications, Techniques, Adjuvants, and Controversies
   Peripheral Nerve Blockade: Indications, Contraindications, Techniques, Adjuvants, and Controversies
   Pharmacology and Toxicity of Local Anesthetics

4. General Anesthesia
   \textbf{TAGS:}
   
   Management of the Difficult Airway

5. Complications of Anesthesia
   \textbf{TAGS:}
   
   Airway Obstruction
   Anaphylactic and Anaphylactoid Reactions
   Awareness and Recall under Anesthesia
   Cardiopulmonary Resuscitation
   Dysrhythmias
   Iatrogenic Drug Errors
   Iatrogenic Trauma/Positioning Injury
   Inadequate Vascular Access

6. Special Techniques and Situations
   \textbf{TAGS:}
   
   Non-Operating Room Anesthesia (NORA)
   Transition of Patient Care

7. Postoperative Period
   \textbf{TAGS:}
   
   Management and Diagnosis of Pain, Anxiety and Emergence Agitation
   Postoperative Nausea and Vomiting

8. Acute and Chronic Pain Management
   \textbf{TAGS:}
   
   Enhanced Recovery after Surgery (ERAS)
   Opioid Induced Hyperalgesia
   Opioid Tolerance

E. Special Problems or Issues

1. Professional Issues
   \textbf{TAGS:}
   
   Continuous Quality Improvement
   Ethical and Legal Obligations of Pediatric Anesthesia Care and Research
   Practice-Based Learning and Improvement
   Teaching, Supervision, and the Anesthesia Care Team

2. Principles of Biostatistics and Study Design