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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
Intraoperative Blood Monitoring

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

Electrical and Fire Safety

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

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

Electrical Safety Systems

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

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
IIE.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:
III.B.1

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
      **TAGS:**
      - Field Block
      - Multimodal Analgesia Strategies
      - Opioids
      - Patient-Controlled Analgesia (PCA)
      - Regional Anesthesia/Nerve Blocks
      - Systemic Local Anesthetics
   3. Respiratory Complications in the PACU
      **TAGS:**
      - Consequences of Anesthesia
      - Consequences of Surgery
   4. Cardiovascular Complications in the PACU
      **TAGS:**
      - Arrhythmias
      - Hypertension
      - Hypotension
      - Myocardial Ischemia
   5. Nausea and Vomiting
      **TAGS:**
      - Etiology
      - Multimodal Drug Therapy
   6. Residual Neuromuscular Blockade
      **TAGS:**
      - Etiology
      - Prevention
      - Recognition
      - Treatment
   7. Neurologic Consequences of Surgery and Anesthesia
      **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
         **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
- Hemotorax
- Lung Abscess
- Mediastinal Masses
- Neoplasm
- Nonventilatory Respiratory Management
- Obstructive Sleep Apnea
- Oxygen Therapy and Toxicity
- Pleural Effusion
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 Thrombocytopeny
   - 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
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 Gastrochisis
- Peritonsillar Abscess
- Pyloric Stenosis
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-uterod 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 Placentation
- 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
      Cholecystectomy
      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:**
Acute Hepatic Failure
Cannilicular
Chronic Hepatic Failure
Infectious
Hepatocellular

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
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:**
- Antiarythmics
- 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 and Reversal
Aortic Clamping
Carotid Clamping
Endovascular Surgery
Renal Protection

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, Infracavicular, 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 Lumborum, 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
- Neuropraxia, 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
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
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
Antidysrhythmics
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
Mitra
Myocardial Function/Dysfunction
Myocarditis
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
Restrictive
SIMV
Sleep Studies
Spontaneous Breathing Trials
Thoracentesis
Thromboembolic
Tracheobronchitis
TRALI
Ultrasound
Vaccination (Pneumovax)
Ventilator Associated
Ventilatory Support
Volutrauma/Barotrauma

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
   - Intravenous
   - 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

4. Miscellaneous Agents: 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
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
   - Interactions between Substance Use Disorder and Pain
   - 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
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
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:
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
Myelination, 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
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

Clinical Science
Prenatal and Postnatal Development
Renal Failure

6. Endocrine/Metabolic

Adrenal Disorders
Clinical Science
Diabetes Insipidus
Diabetes Mellitus
Digeorge Syndrome
Disorders of Sodium Regulation
Pheochromocytoma
Thyroid Disorders

7. Hematology/Oncology

Anemias
Bone Marrow and Stem Cell Transplants
Chemotherapeutic Agents and Side Effects
Clinical Science
Coagulation Disorders
Hematology
Oncology
Radiation Therapy

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

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
      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
   Evaluation of Coexisting Disease
   Fasting Requirements
   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
   TAGS:
   Fluid, Electrolyte, and Glycemic Management
   Thermoregulation
   Transfusion Therapy and Blood Conservation Techniques

3. Regional Anesthesia and Analgesia
   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

TAGS:
Management of the Difficult Airway

5. Complications of Anesthesia

TAGS:
Airway Obstruction
Anaphylactic and Anaphylactoid Reactions
Awareness and Recall under Anesthesia
Dysrhythmias
Iatrogenic Drug Errors
Iatrogenic Trauma/Positioning Injury
Inadequate Vascular Access

6. Special Techniques and Situations

TAGS:
Anesthesia for Satellite and Remote Locations
Transition of Patient Care

7. Postoperative Period

TAGS:
Management and Diagnosis of Pain, Anxiety and Emergence Agitation
Post-operative Nausea and Vomiting

8. Acute and Chronic Pain Management

TAGS:
Enhanced Recovery after Surgery (ERAS)
Opioid Induced Hyperalgesia
Opioid Tolerance

E. Special Problems or Issues

1. Professional Issues

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