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

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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
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
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
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
      Postobstructive 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 $O_2$ Gradient (A-a$O_2$)
- Anion Gap
- Apneic Oxygenation
IV.B.2

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 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
Pituitary: Anterior and Posterior
Thyroid

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

4. Clinical Science
**TAGS:**
- Acromegaly
- Addison Disease
- Carcinoid Syndrome
- Cushing Disease
- Cushing 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
- Neuromyelic and Non-Neuromyelic 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
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 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
      Cholycectomy
      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
      Postoperative 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
Hypoxic Pulmonary Vasoconstriction
Ventilation-Perfusion Matching

2. Pharmacology

TAGS:
Bronchodilators
Fluid Management
Pulmonary Vasodilators

3. Clinical Management of Disease States

TAGS:
Bronchopulmonary Fistula
Bulla/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:
Antiarrythmics
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:
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

8. Healthcare Disparities

**TAGS:**
- Approaches to Reducing Disparities (Race and Ethnicity, Gender, Sexual Identity and Orientation, Disability Status, Geographic Location)
- Cultural Competency
- Determinants of Disparities, Including Systemic Racism
- Effects of Disparities on Access to and Quality of Care
- Effects of Disparities on Outcomes and Health Status
- Social Determinants of Health

9. Diversity, Equity, and Inclusion (DEI) in the Healthcare Workplace

**TAGS:**
- Approaches to Improving DEI in Healthcare
- Gender Equity in the Workplace
- Rationale for DEI in Healthcare
- Threats to DEI, Including Unconscious Bias, Microaggressions, and Stereotype Threat
VII. QUALITY IMPROVEMENT
   A. Quality Assurance and Performance Improvement
      1. Design and Implementation of a QI project
         TAGS:
         Tools for Process Improvement
         QI Methods
      2. Communication and Reporting
         TAGS:
         Outcomes Registries
         Public Reporting
      3. Analysis/assessment of Information
         TAGS:
         Artificial Intelligence
         Data Analytics
         Failure Modes and Effects Analyses
         Morbidity and Mortality
         Peer Review
         Quality Reporting and Dashboards
         Root Cause Analyses
      4. Patient Safety
         TAGS:
         Communication
         Culture of Safety
         Epidemiology of Error
         Evidence-Based Practice
         Human Factors
         Methods and Tools for Evaluating Safety Events
         Outcomes Improvement
         Prevention of Harm/Complications
         Safety Enhancing Technology
         Systems Thinking and the Effect of the System on Patient Safety

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
IX.A.1

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
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
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

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
IX.B.2

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
Mitral
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
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
IX.B.3 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
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
IX.B.7

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
IX.B.8

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, Peralbumin)
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
IX.C.13
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


TAGS:
Analeptic Drugs
Antihistamines
Benzodiazepines
Cannabinoids
Corticosteroids
Local Anesthetics and Membrane-Stabilizing Drugs
Muscle Relaxants and Antispasticity Drugs
Neuroleptic Drugs
NMDA Antagonists
Sympatholytic Drugs
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
Nonsurgical Intervention: Evidence for Efficacy of Reassurance, Maintaining Activity, and Exercises

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
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

TAGS:
Causes of Pain during Pregnancy
Management of Opioids during Pregnancy Including Neonatal Abstinence
Pharmacologic Management of Pain in Pregnancy and Lactation
Principles of Pain Management in Pregnancy

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:**
- Anatomy and Physiology
- Anesthesia for Thoracic Procedures
- Chest Wall Surgery/Reconstruction
- Clinical Sciences
- 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
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