

MOCA Content Outline

CONTINUING CERTIFICATION IN
ANESTHESIOLOGY PROGRAM

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CONTENT OUTLINE

Continuing Certification in Anesthesiology

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I. FUNDAMENTAL TOPICS IN ANESTHESIOLOGY

I.A. Anesthesia Machines and Breathing Systems

I.A.1. Components

TAGS:

- Circuit Types
- CO₂ Absorbers
- High- and Low-Pressure Components
- MRI Compatibility
- Oxygen Supply Systems
- Valves
- Vaporizers
- Waste Gas Evacuation Systems

I.A.2. Safety Features

TAGS:

- Troubleshooting

I.A.3. Design and Ergonomics

I.B. Mechanical or Assisted Ventilation

I.B.1. Classifications

TAGS:

- High-Frequency Ventilation
- Modes of Mechanical Ventilation
- Noninvasive Techniques

I.B.2. Parameters

TAGS:

- Ventilator Settings and Controls

I.B.3. Drug Delivery Systems

TAGS:

- Inhaled Pulmonary Vasodilators
- Inhaled Bronchodilators
- Nebulizers

I.B.4. Ventilation Monitors

TAGS:

- Apnea
- FiO₂
- Airway Pressure Monitoring

I.C. Monitoring

I.C.1. Basic Physiologic

TAGS:

- Capnography
- ECG
- Neuromuscular Blockade

Noninvasive Blood Pressure

Pulse Oximetry

Temperature

I.C.2. Advanced Physiologic

TAGS:

Arterial Wave Form Analysis

Cardiac Output

Cerebral Oximetry

EEG

Neurophysiologic Monitors

Point-of-Care Ultrasound

Noninvasive Cardiac Monitoring

TEE

TTE

I.C.3. Intraoperative Blood Monitoring

TAGS:

Arterial Blood Gas

Coagulation

Glucose

Point-of-Care Laboratory Testing

I.D. Electrical and Fire Safety

I.D.1. National Fire Protection Association (NFPA) Standards

I.D.2. Fire and Explosion Hazards

TAGS:

Fuels

Oxidizers

Sources of Ignition

I.D.3. Electrical Safety Systems

TAGS:

Isolated and Grounded Power Systems

Line Isolation Monitors

I.D.4. Electrical Hazards

TAGS:

Electrosurgery and Safety (Macro- and Microshock)

II. PHARMACOLOGY

II.A. General Concepts

II.A.1. Pharmacogenetics

TAGS:

Butyrylcholinesterase (Pseudocholinesterase) Deficiency

Genetic Factors in Drug Dose-Response Relationships

Malignant Hyperthermia (MH)

Polymorphisms of Drug Metabolism

II.A.2. Drug Interactions

TAGS:

Drug-Drug Binding

Enzyme Induction

Enzyme Inhibition

Perioperative Implications of Alternative and Herbal Medicines

Synergistic Drug Interactions

II.A.3. Drug Reactions

TAGS:

Anaphylactoid

Anaphylaxis

Idiosyncratic

II.A.4. Substance Use Disorder

TAGS:

Anesthetic Implications

Pharmacologic Mechanisms

Physiologic Effects

II.A.5. Agonists and Antagonists

II.A.6. Novel medications

TAGS:

Remimazalam

II.B. Anesthetic Gases and Vapors

II.B.1. Indications and Contraindications

II.B.2. Pharmacokinetics

TAGS:

Delivery Systems: Vaporizers

Metabolism and Excretion

Uptake and Distribution

II.B.3. Pharmacodynamics

TAGS:

Effects on Central Nervous System

Effects on Circulation

Effects on Other Organs

Effects on Ventilation

II.B.4. Drug Interactions

II.B.5. Side Effects and Toxicity

TAGS:

Atmospheric Waste

II.C. Intravenous Anesthetics: Opioid and Non-Opioid

II.C.1. Indications and Contraindications

II.C.2. Pharmacokinetics

TAGS:

Distribution and Redistribution

Metabolism and Excretion

II.C.3. Pharmacodynamics

TAGS:

Effects on Circulation

Effects on Other Organs

Effects on the Central Nervous System

Effects on Ventilation

II.C.4. Drug Interactions

II.C.5. Side Effects and Toxicity

TAGS:

Shivering

II.D. Local Anesthetics

II.D.1. Indications and Contraindications

II.D.2. Pharmacokinetics

TAGS:

Metabolism and Excretion

Uptake and Distribution

II.D.3. Pharmacodynamics

TAGS:

Effects on Circulation

Effects on Other Organs

Effects on the Central Nervous System

Effects on Ventilation

II.D.4. Drug Interactions

II.D.5. Side Effects and Toxicity

TAGS:

Local Anesthetic Systemic Toxicity

II.E. Neuromuscular Blocking Agents: Depolarizing and Non-Depolarizing

II.E.1. Indications and Contraindications

II.E.2. Pharmacokinetics

TAGS:

Distribution and Redistribution

Metabolism and Excretion

Prolongation of Action

II.E.3. Pharmacodynamics

TAGS:

Differential Effects on Muscle Groups

Effects on Neuromuscular Transmission

II.E.4. Drug Interactions

II.E.5. Side Effects and Toxicity

TAGS:

Anaphylaxis
Critical Illness Myopathy

II.E.6. Reversal of Blockade

TAGS:

Antagonism
Chelation

III. CLINICAL SCIENCES: ANESTHESIA PROCEDURES, METHODS AND TECHNIQUES

III.A. Patient Evaluation and Preoperative Preparation

III.A.1. History and Physical Examination
III.A.2. Airway Evaluation

TAGS:

Predictors of Difficult Laryngoscopy and Intubation
Predictors of Difficult Mask Ventilation

III.A.3. Standards and Guidelines

TAGS:

ACC/AHA Guidelines on Perioperative Cardiovascular Evaluation
ASA Physical Status Classification
Indications for Preoperative Testing
Preoperative Fasting Guidelines

III.A.4. Preoperative Management of Chronic Medications

TAGS:

Anticoagulants and Antiplatelet Medications
Antihyperglycemics
Cannabinoids
Cardiovascular Medications
Central Nervous System Medications

III.A.5. Premedication

TAGS:

Antibiotics
Anxiolysis
Aspiration Prophylaxis
PONV Prophylaxis

III.A.6. Patients with Specific Disease States

TAGS:

Cardiovascular Disease
Morbid Obesity
Pulmonary Disease

III.B. Perioperative Management of Patients with Chronic Disease States

III.B.1. Central and Peripheral Nervous System

TAGS:

Chronic Pain States
Deep Brain and Vagal Nerve Stimulators
Dementia
Multiple Sclerosis
Parkinson
Spinal Cord Injury

III.B.2. Respiratory System

TAGS:

Asthma
COPD
Sleep Apnea
Smoking

III.B.3. Cardiovascular System

TAGS:

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

III.B.4. Gastrointestinal/Hepatic Systems

TAGS:

Eating Disorders
GERD
Liver Failure

III.B.5. Renal and Urinary Systems

TAGS:

End-Stage Renal Disease and Dialysis

III.B.6. Hematologic System

TAGS:

Anemia
Coagulopathies
Sickle Cell

III.B.7. Endocrine and Metabolic Systems

TAGS:

Diabetes
Morbid Obesity
Pheochromocytoma
Thyroid Disease

III.B.8. Neuromuscular Diseases

TAGS:

Muscular Dystrophies
Myasthenic Syndromes
Myopathies

III.B.9. Special Problems

TAGS:

- Allergic Reactions
- Chemotherapy
- Chronic Alcohol Use
- Chronic Cannabinoid Use
- Chronic Immunosuppression
- Malignancy
- Previous Organ Transplant
- Substance Use Disorder

III.C. Regional Anesthesia

III.C.1. General Topics

TAGS:

- Guidelines and Standards
- Indications and Contraindications
- Local Anesthetic Systemic Toxicity
- Nerve Stimulator Guidance
- Ultrasound Guidance

III.C.2. Neuraxial

TAGS:

- Complications
- Factors Influencing Onset and Duration
- Indications and Contraindications
- Medications: Local Anesthetics, Opioids, Adjuncts
- Types: Caudal, Epidural, Spinal, Combined Spinal-Epidural

III.C.3. Regional Blocks

TAGS:

- Anatomy
- Catheters
- 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

III.C.4. IV Regional

TAGS:

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

III.D. General Anesthesia

III.D.1. Techniques

TAGS:

- Combined General/Regional
- Inhalational
- Total Intravenous

III.D.2. Airway Management

TAGS:

- Airway Management Devices and Adjuncts
- ASA Difficult Airway Algorithm
- Complications
- Emergency Surgical Airway
- Endotracheal Tube Types
- Flexible Fiberoptic Bronchoscopy
- High-Frequency Jet Ventilation
- Postoperative Considerations
- Regional Airway Blocks

III.E. Monitored Anesthesia Care and Sedation

III.E.1. Guidelines and Standards

III.E.2. Levels of Sedation

III.E.3. Sedation Guidelines for Non-Anesthesiologists

III.F. Asanguineous Intravenous Fluid Therapy during Anesthesia

III.F.1. Indications and Contraindications

TAGS:

- Colloids
- Crystalloids
- Hypertonic Saline

III.F.2. Complications

III.G. Perioperative Complications: Types, Prevention, Treatment

III.G.1. Types

TAGS:

- Air Embolism
- 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
Venous Thromboembolism

III.G.2. Prevention and Treatment

TAGS:
Aspiration of Gastric Contents
Fire Prevention and Management
Management of Intraoperative Patient Temperature
Perioperative Anticoagulation

III.H. Postoperative Period

III.H.1. Emergence and Recovery of Airway Reflexes

III.H.2. Acute Pain Management

TAGS:
Field Block
Multimodal Analgesia Strategies
Opioids
Patient-Controlled Analgesia (PCA)
Regional Anesthesia/Nerve Blocks
Systemic Local Anesthetics

III.H.3. Respiratory Complications in the PACU

III.H.4. Cardiovascular Complications in the PACU

TAGS:
Arrhythmias
Hypertension
Hypotension
Myocardial Ischemia

III.H.5. Nausea and Vomiting

TAGS:
Prophylactic Medications
Risk Factors

III.H.6. Residual Neuromuscular Blockade

III.H.7. Neurologic Consequences of Surgery and Anesthesia

TAGS:
Cognitive Dysfunction
Delirium
Failure to Emerge from Anesthesia
Stroke

IV. ORGAN-BASED BASIC AND CLINICAL SCIENCES

IV.A. Central and Peripheral Nervous Systems

IV.A.1. Anatomy

TAGS:

Autonomic Nervous System
Central Nervous System
Peripheral Nervous System

IV.A.2. Physiology

TAGS:

Autoregulation
Drug Effects
Intracranial Pressure (ICP)
Metabolism
Spinal Reflexes
Vagal Reflex

IV.A.3. Pharmacology

TAGS:

Anticonvulsants
Drug Effects on CNS Blood Flow
Drug Effects on CNS Metabolism
Osmotic Agents

IV.A.4. Clinical Science

TAGS:

Abscess
Air Embolism
Airway Management in the Patient with Cervical Spine Disease
Autonomic Dysfunction
Autonomic Hyperreflexia
Cerebrovascular Accident (CVA)
Coma
Drug Intoxication
Fluid Management
Hydrocephalus
Pituitary Adenomas
Postural Orthostatic Hypotension Syndrome (POTS)
Prone and Sitting Positioning: Implications
Seizures
Spinal Shock
Subdural and Epidural Hematomas
Trans-Sphenoidal Hypophysectomy
Ventriculostomy

IV.B. Respiratory System

IV.B.1. Anatomy

TAGS:

- Alveoli/Lung Parenchyma
- Innervation
- Larynx
- Musculoskeletal
- Tracheobronchial Tree
- Vascular Supply

IV.B.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
- Dead Space
- Diffusion Hypoxia
- Hypercarbia and Hypocarbia
- Hypoxia and Hyperoxia
- Hypoxic Pulmonary Vasoconstriction
- Lung Mechanics
- Nonrespiratory Functions of Lungs: Immune and Metabolic
- Pleural Pressure Gradient
- V/Q Mismatch

IV.B.3. Pharmacology

TAGS:

- Anti-inflammatory Medications
- Bronchodilators

IV.B.4. Clinical Science

TAGS:

- Abdominal Compartment Syndrome
- Acute Respiratory Distress Syndrome (ARDS)
- Arterial Blood Gas Interpretation
- Asthma
- Atelectasis
- Barotrauma
- Bronchiectasis
- Bronchitis
- Bronchopleural Fistula
- Bronchopulmonary Dysplasia
- Bronchospasm: Management

Cancer
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
Nonventilatory Respiratory Management
Obstructive Sleep Apnea (OSA)
Oxygen Therapy and Toxicity
Pleural Effusion
Pneumonia
Pneumothorax
Postoperative Extubation Criteria
Postoperative Mechanical Ventilation
Pulmonary Fibrosis
Respiratory Distress Syndrome (ARDS)
Respiratory Failure Management

IV.C. Cardiovascular System

IV.C.1. Anatomy

TAGS:
Conduction System
Congenital Heart Disease
Coronary Circulation
Innervation
Transesophageal Echocardiography (TEE) Views

IV.C.2. Physiology

TAGS:
Baroreceptor Function
Cardiac Output
Coronary Blood Flow Regulation
Determination of Myocardial Oxygen Demand
Diastolic Dysfunction
Intracardiac Pressures
Mixed Venous Oxygen Tension and Saturation
Rhythm
Systemic and Pulmonary Vascular Resistance
Systolic Dysfunction

Valvular Dysfunction

IV.C.3. Pharmacology

TAGS:

Angiotensin Converting Enzyme Inhibitors
Angiotensin Receptor Blockers
Antiangular Drugs
Antiarrhythmics
Beta-Blockers
Calcium Channel Blockers
Chronotropic Agents
Digitalis
Inotropes
Statins
Vasodilators
Vasopressors

IV.C.4. Clinical Management of Disease States

TAGS:

Cardiac Ischemia
Cardiac Tamponade and Constrictive Pericarditis
Cardiogenic Shock
Cardiomyopathy
Carotid Artery Disease
Dysrhythmia
Hypertrophic Cardiomyopathy
Intracardiac Defects
Myocardial Infarction and Acute Coronary Syndrome
Myocarditis
Peripheral Vascular Disease
Pulmonary Embolism
Pulmonary Hypertension
Right or Left Ventricular Dysfunction
Valvular Abnormalities

IV.C.5. Special Considerations in Cardiovascular Anesthesia

TAGS:

Cardiac Catheterization
Cardiac Implantable Electrical Device Management: AICD and Pacemakers
Electrophysiologic Studies and Procedures
Left Atrial Appendage Occlusion
Left Ventricular Assist Devices
Percutaneous Valvuloplasty and Valve Replacement
Perfusion Studies

IV.D. Gastrointestinal/Hepatic Systems

IV.D.1. Anatomy

TAGS:

Vascular Supply

Innervation: Sympathetic, Parasympathetic, and Enteric

Liver Anatomy

IV.D.2. Physiology

TAGS:

Cytochrome P450 Function and Variants

Excretory Functions

Factors Affecting Splanchnic Circulation

Metabolic and Synthetic Functions

Portal Hypertension

IV.D.3. Pharmacology

TAGS:

Drug Metabolism/Elimination

Hepatotoxicity

IV.D.4. Clinical Science

TAGS:

Acute Hepatitis

Anesthetic Management: Full Stomach

Anesthetic Management: Intestinal Obstruction

Cricoid Pressure

Esophageal Disease

Hepatic Resection

End-Stage Liver Disease

Liver Transplantation

Morbid Obesity/Anesthesia for Bariatric Surgery

Postoperative Hepatic Dysfunction

Postoperative Ileus

IV.E. Renal and Urinary Systems/Electrolyte Balance

IV.E.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

IV.E.2. Pharmacology

TAGS:

Diuretics

Drug Effects on Electrolytes and Acid-Base Balance

Pharmacologic Protection and Treatment of Renal Failure

IV.E.3. Clinical Management of Disease States

TAGS:

Anesthetic Management for Patients on Renal Replacement Therapy

Arteriovenous (AV) Shunts

Chronic Renal Insufficiency and Renal Failure

Perioperative Oliguria and Anuria

Preservation of Renal Function

Nephrectomy

Renal Transplantation

Risk Factors for Acute Renal Failure

IV.E.4. Special Considerations with the Renal System

TAGS:

Transurethral Resection of Prostate (TURP): Complications

Urologic Surgery: Lithotripsy

IV.F. Hematologic System

IV.F.1. Anatomy

IV.F.2. Physiology

TAGS:

Hemostasis

IV.F.3. Pharmacology

TAGS:

Anticoagulants and Antagonists

Antifibrinolytics

Antiplatelet Drugs

Blood Substitutes

Coagulation Factor Concentrates

Erythropoietin

Immunosuppressive and Antirejection Drugs

Iron Therapy

IV.F.4. Clinical Science

TAGS:

Alternatives to Transfusion

Anemias

Autologous Blood Donation

Blood Products

Carboxyhemoglobinemia

Citrate Toxicity
Congenital and Acquired Factor Deficiencies
Disseminated Intravascular Coagulation (DIC)
Fibrinolysis
Hemoglobinopathies
Heparin-Induced Thrombocytopenia (HIT)
IgA Deficiency
Massive Transfusion
Methemoglobinemia
Porphyrias
Thrombocytopenia and Thrombocytopathy
Transfusion Complications: TACO/TRALI
Transfusion Indications
Transfusion: Infection Risks (Cytomegalovirus, HIV, Hepatitis)
Viscoelastic Testing

IV.G. Endocrine and Metabolic Systems

IV.G.1. Anatomy

IV.G.2. Physiology

TAGS:

Adrenal Cortex and Pancreas
Adrenal Medulla
Hypothalamus
Parathyroid
Pituitary: Anterior and Posterior
Thyroid

IV.G.3. Pharmacology

TAGS:

Antihyperglycemic Drugs
Glucocorticoid Supplementation
Mineralocorticoid Supplementation
Somatostatin/Octreotide

IV.G.4. Clinical Science

TAGS:

Acromegaly
Addison Disease
Carcinoid Syndrome
Cerebral Salt-Wasting Syndrome
Cushing Syndrome
Diabetes Insipidus
Diabetes Mellitus
Diabetic Ketoacidosis
Endocrine Tumors

Goiter
Hyperosmolar Coma
Pancreas Transplantation
Parathyroid Disease: Hyper- and Hypoparathyroidism
Pheochromocytoma
Pituitary Disease: Hyper and Hypopituitarism
Primary Aldosteronism
Recurrent Laryngeal Nerve Injury
Syndrome of Inappropriate ADH Secretion
Thyroid Disease: Hyper and Hypothyroidism
Thyroid Storm Management

IV.G.5. Biochemistry of Normal Body Metabolism

TAGS:

Fluid Homeostasis
Glucose Homeostasis
Surgical Stress Response

IV.H. Neuromuscular System

IV.H.1. Anatomy

TAGS:

Acetylcholine Receptor

IV.H.2. Physiology

TAGS:

Factors Impacting Muscle Strength
Neuromuscular Transmission

IV.H.3. Pharmacology

TAGS:

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

IV.H.4. Diseases and Disorders: Clinical Science

TAGS:

Diseases of the Neuromuscular Junction
Inflammatory Myopathies
Metabolic Diseases of the Muscle
Motor Neuron Diseases
Peripheral Nerve Diseases

V. CLINICAL SUBSPECIALTIES

V.A. Pain Management

V.A.1. Pathophysiology

TAGS:

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

V.A.2. Diagnostic Strategies

TAGS:

Diagnostic Blocks
Electromyography (EMG)
Imaging Modalities

V.A.3. Treatment of Painful Disease States

TAGS:

Acupuncture
Electrical Stimulation
Neuraxial Analgesia
Neurolytic and Non-Neurolytic Blocks
Patient-Controlled Analgesia
Peripheral Nerve Blockade and Catheters
Pharmacologic Therapy
Postdural Puncture Headache
Sickle Cell Disease
Sympathetic Nerve Blocks

V.B. Pediatric Anesthesia

V.B.1. Clinical Science

TAGS:

Airway Selection
Behavioral Development
Infants: Fluid and Glucose Management
Infants: Respiratory Physiology
Infants: Thermoregulation
Malignant Hyperthermia: Susceptibility and Management
Neonatal Resuscitation Guidelines
Neonates: Transitional Circulation
Organ Function Changes During Development
Pediatric Advanced Life Support (PALS)

Parental Presence
Upper Respiratory Infections (Colds)

V.B.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

V.B.3. Clinical Management of Disease States

TAGS:

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

V.B.4. Special Considerations in Pediatric Anesthesia

TAGS:

Airway Foreign Bodies
Apnea of Prematurity
Bladder and Urethral Malformations
Bronchoscopy: Flexible and Rigid
Bronchospasm
Cleft Lip and Palate
Congenital Hip Dysplasia
Craniofacial Abnormalities
Difficult Airway Management
Difficult IV Access
Emergence Delirium
Intubation and Extubation Complications
Jet Ventilation
Laryngoscopy Techniques
Laser
Pediatric Regional Anesthetic Techniques
Pediatric Respiratory Adverse Events (PRAE)
Pediatric Sedation
PONV
Postoperative Pain Management: Codeine
Premedication Techniques
Propofol Infusion Syndrome
Strabismus
Stridor
Tonsillectomy and Adenoideectomy
Upper Respiratory Infection
Urologic Procedures

V.C. Obstetric Anesthesia

V.C.1. Clinical Science

TAGS:

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

V.C.2. Pharmacology

TAGS:

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

V.C.3. Clinical Management of Disease States

TAGS:

- Amniocentesis
- Amniotic Fluid Embolism
- Antepartum Fetal Therapy
- Antepartum Hemorrhage
- Anticoagulant Therapy
- Cardiovascular Disease
- Ectopic Pregnancy
- Endocrine Disease
- Ex-utero Intrapartum Treatment (EXIT)
- Fetal Malposition
- Fetal Malpresentation
- Fever and Infection
- Gestational Trophoblastic Surgery Disease
- Hematologic Disease
- Maternal Cardiopulmonary Resuscitation
- Multiple Gestation
- Neurologic Disease
- Obesity
- Placenta Abruptio
- Placenta Accreta Spectrum
- Placenta Previa
- Postpartum Hemorrhage
- Preeclampsia and Eclampsia
- Preterm Labor
- Renal Disease
- Respiratory Disease
- Resuscitation of Newborn
- Retained Placenta
- Rh and ABO Incompatibility
- Spontaneous Abortion

Substance Use Disorder
Trial of Labor after Cesarean (TOLAC)
Umbilical Cord Blood Gas Measurements
Umbilical Cord Prolapse
Uterine Atony
Uterine Rupture

V.C.4. Special Considerations in Obstetric Anesthesia

TAGS:

Antepartum Fetal Assessment
Aorto-Caval Compression
Cesarean Delivery: Elective Anesthesia
Cesarean Delivery: Emergency Anesthesia
Difficult Airway
Gastroesophageal Sphincter Function
Influence of Anesthetic Technique on Labor
Neonatal Assessment: Apgar Score
Nonobstetric Anesthesia in Pregnancy
Operative Vaginal Delivery
Postdural Puncture Headache
Pulmonary Aspiration
Regulation of Uterine Blood Flow
Thermoregulation

V.C.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

V.C.6. Maternal-Fetal Considerations

TAGS:

Intrapartum Fetal Monitoring
Intrauterine Fetal Resuscitation

V.C.7. Pathophysiology of Complicated Pregnancy

V.D. Otorhinolaryngology (ENT) Anesthesia

V.D.1. Surgical Procedures

TAGS:

Airway Endoscopy
Microlaryngeal Surgery
Radical Neck Dissection
Sinus Endoscopy
Tonsillectomy
Transoral Robotic Surgery
Uvulopalatopharyngoplasty

V.D.2. Laser Surgery

TAGS:

Airway Fires
Lasers: Safety Implications
Laser-Safe Endotracheal Tubes

V.D.3. Anesthetic Management

TAGS:

Airway Management
Anesthesia for Vascular Flaps
Effects of Radiation Therapy
Ventilation Strategies, Including Jet Ventilation

V.E. Anesthesia for Plastic Surgery

V.E.1. Surgical Procedures

TAGS:

Breast Surgery
Facial Aesthetic Procedures
Free Flap Reconstruction
Gender-Affirming Surgery
Liposuction
Orthognathic Surgery

V.E.2. Pharmacology

TAGS:

Botulinum Toxin
Dermal Fillers
Tumescent: Volume Overload, LAST

V.E.3. Anesthetic Management

V.E.4. Special Considerations in Plastic Surgery

TAGS:

Fire Risk

V.F. Anesthesia for Laparoscopic Surgery

V.F.1. Surgical Procedures

TAGS:

Appendectomy
Bariatric Surgery

Cholecystectomy
Gynecologic Procedures
Hiatus Hernia Repair

V.F.2. Anesthetic Management

TAGS:
Monitoring
Patient Positioning
Physiology
Robotic Procedures
Ventilation

V.F.3. Risks

TAGS:
CO₂ Embolism
Hemorrhage
Hypercapnea
Hypotension
Subcutaneous Emphysema
Vascular or Organ Perforation

V.G. Ophthalmologic Anesthesia

V.G.1. Clinical Science

TAGS:
Retrobulbar and Peribulbar Blocks

V.G.2. Pharmacology

V.G.3. Clinical Management of Disease States

TAGS:
Open Eye Injuries

V.G.4. Special Considerations in Ophthalmologic Anesthesia

TAGS:
ASA Preoperative Testing Guidelines
Oculocardiac reflex
Preoperative Selection

V.H. Orthopedic Anesthesia

V.H.1. Tourniquet Management

TAGS:
Ischemia
Nerve Injury
Reperfusion

V.H.2. Spine Surgery

TAGS:
Anesthetic Technique
Antifibrinolytics
Cervical Spine Disease

Neurophysiologic Monitoring

Postoperative Visual Loss

V.H.3. Complications

TAGS:

Blood Loss

Fat Embolism

Methyl Methacrylate

Positioning Injury

Venous Air Embolism

V.H.4. Anesthetic Techniques

TAGS:

Regional vs. General Anesthesia

V.H.5. Special Considerations in Orthopedic Surgery

TAGS:

Ankylosing Spondylitis

Compartment Syndrome

Postoperative Analgesia

Rheumatoid Arthritis

Scoliosis

Thromboprophylaxis

V.I. Trauma Anesthesia

V.I.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

V.I.2. Secondary Survey and Stabilization

TAGS:

Fluid Management

Hemostatic Resuscitation

Hypothermia

Massive Transfusion

Monitoring

Nuclear, Biological, and Chemical Injury

POCUS

Protection of Cervical Spine

V.I.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

V.I.4. Thermal and Electrical Injury

TAGS:

- Airway Management
- Carbon Monoxide/Carboxyhemoglobin
- Fluids and Electrolytes
- Inhalation Injury
- Nondepolarizing Muscle Relaxants
- Succinylcholine Use
- Vasoconstrictor Effects and Complications

V.I.5. Special Considerations in Trauma Anesthesia

TAGS:

- Decontamination
- Exposure/Hypothermia
- Geriatrics
- Near Drowning
- Nuclear, Biological, and Chemical Injury
- Pain Management

V.J. Anesthesia for Ambulatory Surgery

V.J.1. Patient Selection and Preoperative Management

TAGS:

- ACC/AHA Guidelines on Perioperative Cardiovascular Evaluation
- Malignant Hyperthermia
- Obesity
- Preoperative Selection
- Risk Factors for Admission

V.J.2. Anesthetic Management

TAGS:

- Ambulatory Regional Anesthesia
- Continuous Nerve Blocks

V.J.3. Discharge Criteria and Postoperative Follow-Up

TAGS:

- Discharge Criteria

V.J.4. Office-Based Anesthesia

TAGS:

- Equipment

Organization

Patient Management

Safety

V.K. Geriatric Anesthesia/Aging

V.K.1. Preoperative Evaluation

TAGS:

Coexisting/Chronic Disease Processes

Medication Management

Risk Reduction and Stratification

V.K.2. Organ Function Changes with Aging

TAGS:

Cardiovascular System

Central Nervous System

Endocrine System

Hematologic System

Hepatic System

Renal System

Respiratory System

V.K.3. Pharmacology

TAGS:

Adverse Response to Medications

Beers Criteria

Changes in PK/PD with Aging

V.K.4. Anesthetics

TAGS:

General

Local

Sedation

Regional

V.K.5. Fluid Management

V.K.6. Pain Management

V.K.7. Thermoregulation

V.K.8. Ethics and Informed Consent

V.K.9. Postoperative Care and Transitions of Care

TAGS:

Delirium

Postoperative Cognitive Dysfunction

V.K.10. Patient Safety

V.L. Critical Care Anesthesia

V.L.1. Central Nervous System Dysfunction

TAGS:

Altered Mental Status

Brain Death
Brain Trauma
Delirium
Metabolic Encephalopathy
Neuromuscular Pathology
Spinal Cord Compromise
Stroke: Ischemic or Hemorrhagic
Subarachnoid, Epidural Bleed

V.L.2. Cardiovascular Dysfunction/Failure

TAGS:

Cardiac Interventions: Lysis, Catheter, PCI, Pacer
Cardiogenic Shock
Congestive Heart Failure
Device Management
Dysrhythmias
ECMO
Myocardial Ischemia/Infarction
POCUS
Pulmonary Hypertension
Vascular Disease: Aneurysm, Dissection, Thrombosis

V.L.3. Respiratory Dysfunction/Failure

TAGS:

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

V.L.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

V.L.5. Hepatic Dysfunction/Failure

TAGS:

- Acute Hepatic Failure
- Chronic Hepatic Failure
- End-Stage Liver Disease

V.L.6. Renal Dysfunction/Failure

TAGS:

- Acute Kidney Injury
- Chronic Kidney Disease
- End-Stage Renal Disease
- Renal Replacement Therapy

V.L.7. Hematologic Dysfunction

TAGS:

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

V.L.8. Gastrointestinal Dysfunction

TAGS:

- Hemorrhage
- Ileus
- Inflammatory/Infectious

V.L.9. Endocrine Dysfunction

TAGS:

- Adrenal
- Pancreatic
- Pituitary
- Thyroid

V.L.10. Dermatologic Dysfunction

TAGS:

- Pressure Injury

V.L.11. Additional Critical Care Topics

TAGS:

- Drug Overdose
- Epidemic Management
- ICU Management/Organization
- ICU Monitoring
- ICU Procedures
- Multi-Organ Failure
- Nutritional Support
- Targeted Temperature Management

Toxicology
Transplantation Management

V.M. Neuroanesthesia

V.M.1. Clinical Science

TAGS:

Cerebral Ischemia
Cerebral Vasospasm
Factors Impacting Cerebral Blood Flow
Factors Impacting Intracranial Pressure

V.M.2. Pharmacology

TAGS:

Anesthetics
Anticonvulsants
Anti-Parkinsonian Medications
Diuretics
Fluid Management
Steroids
Vasodilators and Vasoconstrictors

V.M.3. Clinical Management of Disease States

TAGS:

Arteriovenous Malformations
Cerebral Herniation
Cervical Spine Disease
Coma
Hydrocephalus, VP Shunts, Ventriculostomy
Intracranial Aneurysm
Intracranial Hypertension
Intracranial Masses
Intracranial Vascular Lesions
Moyamoya Disease
Pituitary Adenomas
Posterior Fossa Procedures
Skull-Base Tumors
Traumatic Brain Injury

V.M.4. Special Considerations in Neuroanesthesia

TAGS:

Deep Brain and Vagal Nerve Stimulators
External Ventricular Drains
Interventional Radiology
Intraoperative MRI
Neurophysiologic Monitoring
Patient Positioning

Seizures
Spinal Drains
Venous Air Embolism

V.N. Thoracic Anesthesia

V.N.1. Clinical Science

TAGS:

Anesthetic Techniques for Thoracotomy and Thoracoscopy
Complications: Cardiac Herniation
Hypoxic Pulmonary Vasoconstriction
Lung Separation Techniques: Double-Lumen Tubes and Endobronchial Blockers
One-Lung Ventilation
Preoperative Assessment and Optimization
Pulmonary Function Tests (PFTs)

V.N.2. Pharmacology

TAGS:

Bronchodilators
Fluid Management
Pulmonary Vasodilators

V.N.3. Clinical Management of Disease States

TAGS:

Bronchopulmonary Fistula
Bullae/Recurrent Pneumothorax
Chronic Obstructive Pulmonary Disease
Empyema
Endocrine-Secreting Tumors
Mediastinal Masses
Myasthenia Gravis/Myasthenic Syndromes
Pleural Disease
Reactive Airways Disease
Restrictive Pulmonary Disease

V.N.4. Special Considerations in Thoracic Anesthesia

TAGS:

Esophageal Resection
Jet Ventilation
Lung Resection
Mediastinoscopy
Pain Management
Pneumonectomy
Postoperative Complications
Rigid Bronchoscopy
Thymectomy
Tracheal Resection

V.O. Cardiac Anesthesia

V.O.1. Clinical Science

TAGS:

- Factors Impacting Cardiopulmonary Pressures
- Factors Impacting Contractile Heart Function
- Factors Impacting Coronary Blood Flow
- Myocardial Ischemia/Reperfusion

V.O.2. Pharmacology

TAGS:

- Antiarrhythmics
- Antiplatelet Agents
- Beta-Adrenergic Blockers
- Chronotropic Agents
- Heparin and Alternatives
- Inotropes
- Protamine
- Statins
- Vasodilators and Vasoconstrictors

V.O.3. Clinical Management of Disease States

TAGS:

- Aortic Aneurysm: Thoracic
- Aortic Dissection
- Aortic Insufficiency
- Aortic Stenosis
- Arrhythmias
- Atrial Septal Defects
- Carcinoid Heart Disease
- Congenital Heart Disease
- Congestive Heart Failure
- Diastolic Dysfunction/Heart Failure
- Endocarditis
- Hypertrophic Cardiomyopathy
- Ischemic Cardiomyopathy
- Ischemic Heart Disease
- Mitral Regurgitation
- Mitral Stenosis
- Nonischemic Cardiomyopathy
- Pericardial Effusion/Tamponade
- Post-Cardiac Arrest Care/Normothermia/Hypothermia
- Pulmonary Valve Disease
- Tricuspid Regurgitation
- Tricuspid Stenosis

Ventricular Septal Defects

V.O.4. Special Considerations in Cardiac Anesthesia

TAGS:

- Anticoagulation and Reversal
- Blood Conservation
- Circulatory Assist Devices
- ECMO (VA, VV)
- Extracorporeal Circulation
- Heparin-Induced Thrombocytopenia
- Pacemaker Management
- Thoracoabdominal Aortic Aneurysm
- Transesophageal Echocardiography
- Unintended Intraoperative Awareness

V.P. Vascular Anesthesia

V.P.1. Clinical Science

TAGS:

- Cardiac Risk Assessment and Preoperative Optimization
- Factors Affecting Organ/Peripheral Perfusion

V.P.2. Pharmacology

TAGS:

- Heparin
- Protamine
- Statins

V.P.3. Clinical Management of Disease States

TAGS:

- Aortic Aneurysm
- Carotid Endarterectomy, Stent Procedures
- Peripheral Vascular Disease

V.P.4. Special Considerations in Vascular Anesthesia

TAGS:

- Anticoagulation and Reversal
- Aortic Clamping
- Carotid Clamping
- Endovascular Surgery
- Renal Protection

V.Q. Regional Anesthesia

V.Q.1. General Topics

TAGS:

- Anticoagulation in Regional Anesthesia
- Guidelines and Standards
- Indications and Contraindications
- Nerve Localization: Nerve Stimulator, Landmarks, Ultrasound

Nerve Structural Anatomy

Sedation and Monitoring

V.Q.2. Pharmacology

TAGS:

Liposomal Bupivacaine

Local Anesthetics and Adjuncts

V.Q.3. Neuraxial Anesthesia

TAGS:

Anatomy and Sonoanatomy

Caudal Anesthesia

Combined Spinal-Epidural Anesthesia

Complications

Epidural Anesthesia

Epidural Blood Patch

Factors Influencing Onset and Duration

Indications and Contraindications

Medications: Local Anesthetics, Opioids, Adjuncts

Patient-Controlled Epidural Analgesia

Spinal Anesthesia

V.Q.4. Upper Extremity Regional Anesthesia

TAGS:

Brachial Plexus Anatomy and Sonoanatomy

Brachial Plexus Blocks: Interscalene, Supraclavicular, Infraclavicular, Axillary

Cervical Plexus Blocks: Superficial, Deep

Other: Musculocutaneous, Wrist Blocks

Suprascapular/Shoulder Blocks

V.Q.5. Lower Extremity Regional Anesthesia

TAGS:

Ankle Block and Anatomy

Inguinal Region Nerve Blocks: Femoral, LFCN, Obturator, Fascia Iliaca, 3-in-1

Lumbar Plexus, Femoral, and Saphenous Anatomy and Sonoanatomy

Saphenous, Adductor Canal Blocks

Sciatic Nerve and Sacral Plexus Anatomy and Sonoanatomy

Sciatic Nerve Blocks: Popliteal, Transgluteal, Infragluteal

V.Q.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

V.Q.7. Complications and Side Effects

TAGS:

- Falls
- Hematoma
- Horner Syndrome
- Infection/ Abscess
- Intraneurial Injections
- Local Anesthetic Systemic Toxicity
- Neuropaxia, Nerve injury
- Opioid
- Phrenic Nerve Block
- Postdural Puncture Headache
- Rebound Pain

V.Q.8. Ultrasound-Guided Regional Anesthesia

TAGS:

- Image Generation and Display
- Needle and Probe Alignment
- Ultrasound Artifacts
- Ultrasound Physics

V.Q.9. Continuous Regional Anesthesia

TAGS:

- Complications and Side Effects
- Indications and Contraindications
- Perineural Infusions: Medications, Pumps, Dosing Parameters

V.Q.10. IV Regional

TAGS:

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

V.R. Acute Pain Management

V.R.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

V.R.2. Alternative Analgesic Modalities

TAGS:

Acupuncture
Complementary Therapies
Hypnosis
TENS Therapy

V.R.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 Tolerance
Opioid-Induced Hyperalgesia
Oral Therapy
Parenteral Therapy
Patient-Controlled Analgesia
Physical Therapy
Psychiatric Comorbidities
Substance Use Disorder
Transdermal Therapy
Transition to Chronic Pain

V.R.4. Monitoring and Safety

TAGS:

Cardiopulmonary Monitoring
Complications and Side Effects
Controlled Substance Prescribing
Drug Testing
Legal Issues
Level of Care

VI. SPECIAL PROBLEMS OR ISSUES IN ANESTHESIOLOGY

VI.A. Electroconvulsive Therapy

VI.A.1. Physiology

TAGS:

Central Nervous System Effects

Hemodynamic Effects

VI.A.2. Pharmacology

TAGS:

Anticholinergics

Beta-Blockers

Sedative-Hypnotics

Vasodilators

VI.B. Organ Donors

VI.B.1. Pathophysiology

VI.B.2. Clinical Management

TAGS:

Criteria for Brain Death

Donation after Cardiac Death

Donation after Brain Death

VI.C. Non-Operating Room Anesthesia (NORA)

VI.C.1. MRI

TAGS:

Anesthetic Management

Monitoring

Risks/Contraindications

VI.C.2. Electrophysiology

TAGS:

Ablation Procedures/Cardioversion

Cardiac Implantable Devices

VI.C.3. Interventional Radiology

TAGS:

Angiography/Thrombolysis

CT-Guided Procedures

Endovascular (catheter-directed) therapy

Intravenous Contrast

Transhepatic Intrahepatic Portosystemic Shunt

VI.C.4. Gastrointestinal Endoscopy

TAGS:

Colonoscopy/Upper Endoscopy

Endoscopic Retrograde Cholangiopancreatography

Invasive Endoscopic Procedures

Monitored Anesthesia Care (MAC) vs. General Anesthesia

VI.C.5. Neurointerventional Procedures

TAGS:

- Acute Stroke/Cerebral Revascularization
- Cerebral Vasospasm
- Intracranial Aneurysms

VI.C.6 Bronchoscopy Procedures

TAGS:

- Endobronchial Ultrasound (EBUS)
- Pulmonary Hemorrhage

VI.C.7. Cardiac Catheterization Procedures

TAGS:

- Left Atrial Appendage Occlusion Procedures
- Mitral Valve Repairs
- Transfemoral Aortic Valve Replacement (TAVR)

VI.C.8. Transesophageal Echocardiography

VI.C.9. Radiation Therapy

VI.D. Physician Impairment or Disability

VI.D.1. Substance Use Disorder

VI.D.2. Fatigue

VI.D.3. Aging

VI.D.4. Visual and Auditory Impairment

VI.D.5. Americans with Disabilities Act (ADA)

VI.D.6. Abusive or Disruptive Physicians

VI.D.7. Sexual Harassment

VI.D.8. Physician Burnout and Wellness

VI.E. Ethics, Practice Management and Medicolegal Issues

VI.E.1. Professionalism and Licensure

VI.E.2. Ethics

TAGS:

- Do-Not-Resuscitate (DNR) Orders and Advance Directives
- End-of-Life Issues (Withholding/Withdrawal)
- Jehovah's Witness Patient Care
- Mandatory Reporting

VI.E.3. Informed Consent

TAGS:

- Components of Informed Consent
- Principles

VI.E.4. Malpractice

TAGS:

- Closed Claims Findings
- Legal Actions and Consequences
- National Practitioner Data Bank

Professional Liability Insurance

VI.E.5. Practice Management

TAGS:

Health Insurance Portability and Accountability Act (HIPAA)

Medicare/Medicaid Requirements

Patient Privacy

VI.E.6. Costs of Medical/Anesthesia Care

TAGS:

Operating Room Management

VI.E.7. Patient Safety

TAGS:

Disclosure of Errors to Patients

Medication Errors: Assessment and Prevention

VI.E.8. Healthcare Disparities

TAGS:

Reducing Disparities

Cultural Competency

Effects of Disparities on Access to and Quality of Care, Outcomes, and Health Status

Social Determinants of Health

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

TAGS:

Approaches to Improving DEI in Healthcare

Equity in the Workplace

Threats to DEI, Including Unconscious Bias, Microaggressions, and Stereotype Threat

VII. QUALITY IMPROVEMENT

VII.A. Quality Assurance and Performance Improvement

VII.A.1. Design and Implementation of a QI Project

TAGS:

Tools for Process Improvement

QI Methods

VII.A.2. Communication and Reporting

TAGS:

Outcomes Registries

Public Reporting

VII.A.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

VII.A.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 Systems, Tools, and Processes

VIII. OVERVIEW OF ANESTHESIOLOGY TOPICS

VIII.A. Review of Current Topics in Anesthesiology

IX. CRITICAL CARE MEDICINE

IX.A. Basic Pathophysiology

IX.A.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

IX.A.2. Cardiovascular

TAGS:

- Aneurysm, Abdominal
- Aneurysm, 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
Deep Vein Thrombosis
Eisenmenger Syndrome
Endocarditis
Heart Block
Hypertension
Hypertrophic Cardiomyopathy (Hypertrophic Obstructive Cardiomyopathy,
Asymmetric Septal Hypertrophy, Idiopathic Hypertrophic Subaortic Stenosis)
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
Pericarditis
Peripheral Vascular Disease
Pulmonary Hypertension
Pulmonary Valve
Pulmonic Insufficiency
Pulmonic Stenosis
Pulseless Electrical Activity (PEA)
Rhythm Disturbances
Right Ventricular
Shock States
Supraventricular Tachyarrhythmias, Including Atrial Flutter, Fibrillation
Systemic Hypertension
Systolic Dysfunction
Tetralogy of Fallot
Trauma
Tricuspid Valve Dysfunction
Valvular
Ventricular Tachycardia/Fibrillation

IX.A.3. Pulmonary

TAGS:

- Airway Diseases
- ARDS
- Aspiration
- Bronchopleural Fistula
- Chest Trauma
- Community-Acquired

Embolic Disorders
Empyema/Abscess
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
Transfusion-Related Acute Lung Injury
Ventilator-Associated

IX.A.4. Renal

TAGS:

AKI
Infection
Intrinsic Renal
Postrenal
Prerenal
Renal Tubular Acidosis

IX.A.5. Hematologic/Oncologic

TAGS:

Anemia
Bone Marrow/Stem Cell Transplantation
Carboxyhemoglobin
Coagulopathies
Disseminated Intravascular Coagulation
Fibrinolysis
Methemoglobin
Polycythemia
Platelet Abnormalities
Thrombocytopenia
Thrombocytosis
Tumor Lysis Syndrome
Vitamin K Dependent Coagulopathy
White Blood Cell Disorder

IX.A.6. Obstetric

TAGS:

Coagulopathy, Bleeding Disorders
Complications of Pregnancy
Emboli
Liver Function Abnormalities
Pre-Eclampsia/Eclampsia

IX.A.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

IX.A.8. Gastrointestinal

TAGS:

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

Vascular Diseases

IX.A.9. Dermatologic

TAGS:

Allergic Reactions

Infection

Inflammatory Diseases of the Skin

Necrotizing Fasciitis

Stevens-Johnson Syndrome

IX.A.10. Immunologic/Infectious Disease

TAGS:

Acquired

Autoimmune

Graft vs. Host Disease

HIV/AIDS

Immune Suppression

Mixed Connective Tissue Disease

Sepsis

Systemic Inflammatory Response Syndrome

Therapeutic

Vasculitides

IX.A.11. Acid-base and Electrolyte Abnormalities

TAGS:

Acid-Base Abnormalities

Calcium

Chloride

Electrolyte Abnormalities

Magnesium

Metabolic

Mixed

Phosphorus

Potassium

Respiratory

Sodium

IX.B. Critical Illness Diagnosis and Management

IX.B.1. Central Nervous System

TAGS:

Abscess

Altered Mental Status

Angiography

Anticonvulsants

Antimicrobials

Brain Death

Coma

Critical Illness Polyneuropathy

Degenerative Disease of the Brain

Delirium

Diagnoses

Diagnostic Modalities

EEG, Processed EEG
Emolic/Thrombotic
EMG/NCS
Encephalitis
Guillain-Barré Syndrome
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
Neuromuscular Disorders
Nuclear Medicine Studies
Other Therapies
Pituitary Disorders
Plasmapheresis/Plasma Exchange
Seizures and Status Epilepticus
Spinal Cord Injury
Steroids
Stroke
Subarachnoid, Subdural, Epidural Hematoma
Surgical Interventions
Transcranial Doppler
Vascular Malformations
Vasoactive Drugs

IX.B.2. Cardiovascular

TAGS:

Automatic Implantable Cardioverter Defibrillators
Aneurysm, Thoracic
Anticoagulants and Antithrombotics
Antidysrhythmics
Antifibrinolytics
Antihypertensives
Antimicrobials
Antiplatelet Agents
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
CVP
Diagnostic Modalities
Diastolic Dysfunction
ECG
ECMO
Eisenmenger Syndrome
Endocarditis
External Defibrillators
Heart Block
Hemodynamic Monitoring
Heparin
Heparinoids
Hypertension
Hypertrophic Cardiomyopathy (Hypertrophic Obstructive Cardiomyopathy, Asymmetric Septal Hypertrophy, Idiopathic Hypertrophic Subaortic Stenosis)
Hypovolemic
Imaging
Infectious
Inotropes/Chronotropes/Lusitropes
Intra-Aortic Balloon Pump
Junctional or Nodal Rhythm
Left or Right Ventricular Assist Device
Left Ventricular
Low Molecular Weight Heparin
Management Strategies
Myocardial Function/Dysfunction
Myocarditis
Noninfectious Myocarditis
Obstructive
Other Bedside Ultrasound
Pacemakers/Defibrillators
Papillary Muscle Dysfunction
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
Stunned Myocardium
Supraventricular Tachyarrhythmias, Other
Systolic Dysfunction
Tamponade
Tetralogy of Fallot
Thrombin Inhibitors
Thrombolytics
Transthoracic
Transvenous/Epicardial
Traumatic
Tricuspid Valve Disease
Valvular
Vasoconstrictors
Vasodilators
Ventricular Tachycardia/Fibrillation
Warfarin

IX.B.3. Pulmonary

TAGS:

Airway Diseases
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
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
Pressure Control/Volume Control
Pleural Effusion
Pneumonia
Positioning
Pressure-Support Ventilation
Pulmonary Function Studies/Pulmonary Mechanics
Pulmonary Medications
Pulse Oximetry
Respiratory Failure
Synchronized Intermittent Mandatory Ventilation
Spontaneous Breathing Trials
Thoracentesis
Thromboembolic
Tracheobronchitis
Transfusion-Related Acute Lung Injury
Ultrasound
Ventilator-Associated
Ventilatory Support
Volutrauma/Barotrauma

IX.B.4. Renal

TAGS:
Angiography
Antimicrobials/Antifungals
Biomarkers
Buffers
Continuous Renal Replacement Therapies Including Ultrafiltration
Contrast-Induced Nephropathy
CT/MRI
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
Pharmacologic Therapies
Postrenal
Prerenal
Renal Failure
Renal Replacement Therapies
Renal Transplantation
Renal Trauma
Renal Tubular Acidosis
Ultrasound

IX.B.5. Hematologic/Oncologic

TAGS:

Anemia
Anticoagulants
Antiplatelet Agents
Carboxyhemoglobin
Coagulopathies
Congenital
Diagnoses
Diagnostic Modalities
Disseminated Intravascular Coagulation
Erythropoietin, G-CSF
Fibrinolysis
Hemoglobin Abnormalities
Heparin
Heparinoids
Hypercoagulable State
Isolated Factor Abnormalities
IVC Filters, Other Mechanical Devices
Low-Molecular-Weight Heparin
Management Strategies
Methemoglobin
Other Hemoglobinopathies
Plasmapheresis/Plasma Exchange
Platelet Abnormalities
Polycythemia
Reversal Agents
Routine Blood Studies
Thrombin Inhibitors
Thrombocytopenia, Including Heparin-Induced
Thrombocytosis
Thrombolytics
Transfusion and Factor Replacement
Tumor Lysis Syndrome
Vitamin K Dependent
Warfarin

IX.B.6. Obstetric

TAGS:

Anticoagulants
Anticonvulsants
Antihypertensive Therapy
Antimicrobials
Coagulopathy, Bleeding Disorders
Delivery
Diagnoses
Diagnostic Modalities
Embolus (Amniotic Fluid, Thromboemboli, Other)
Liver Function Abnormalities
Management Strategies
Peripartum Infection
Preeclampsia/Eclampsia

IX.B.7. Endocrine

TAGS:
Adrenal
Adrenal Insufficiency
Antihypertensives
Cerebral Salt Wasting
Critical Illness Effects on Thyroid Function
Cushing Syndrome
Diabetes Insipidus Including Central, Nephrogenic
Diabetes Mellitus
Diagnoses
Diagnostic Modalities
Desmopressin
Glucose Management
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

IX.B.8. Gastrointestinal

TAGS:
Abdominal Compartment Syndrome
Abdominal Pressure Measurement
Antimicrobials

Assessment of Bowel Motility
Bowel Disorders
Coagulation Parameters
Diagnoses
Diagnostic Modalities
Diuretics, Renal Replacement Therapies
Dysfunction/Failure, Acute and Chronic
Endoscopy, Upper, Lower
Endoscopy, Upper, Lower with Therapeutic Intervention
Endoscopy, Upper, Lower; Endoscopic Retrograde Cholangiopancreatography
Gall Bladder Disease (Stones, Cholecystitis)
Gastritis
Gastrointestinal Hemorrhage
Gastrointestinal Motility Dysfunction, Gastroesophageal Reflux Disease
Hepatic
Hepatic Encephalopathy
Hepatitis
Hepatocellular Carcinoma
Hepatorenal Syndrome
Imaging
Interventional Radiology (Embolization, Coiling)
Lactulose, Rifaximin
Liver Transplantation, Rejection, Complications
Management of Increased ICP
Management Strategies
MRI
Nuclear Medicine Studies
Nutritional Assessment (Albumin, Prealbumin)
Nutritional Support (Enteral, Parenteral)
Pancreatic Cancer
Pancreatitis
Paracentesis
Pharmacologic Management
Stool Assessment (Occult Blood, *C. Diff* Toxin)
Surgical Intervention (Timing, Therapeutic Options)
Ulcer
Ultrasound
Urine Electrolytes (Fractional Excretion of Sodium)
X-ray

IX.B.9. Dermatologic

TAGS:

Allergic Reactions
Antimicrobials, Antihistamines
Complete Blood Count with Differential
Diagnoses
Diagnostic Modalities
Immunologic Studies
Infection

Inflammatory Diseases of the Skin

Management Strategies

Necrotizing Fasciitis

Other Topical Medications

Pharmacologic

Steroids, Systemic and Topical

Stevens-Johnson Syndrome

IX.B.10. Immune/Infectious Disease

TAGS:

Antimicrobials (Including Prophylaxis)

Autoimmune

Biomarkers

Biopsy, Selective Aspiration

Congenital

Cultures

Diagnoses

Diagnostic Modalities

Graft vs. Host Disease

Highly Active Antiretroviral Therapy

HIV/AIDS

Immune Suppression

Immunologic Studies

Laboratory Studies

Management Strategies

Neutropenia

Pharmacologic

Sepsis

Systemic Inflammatory Response Syndrome

Systemic Lupus Erythematosus

Steroids

IX.B.11. Acid-base and Electrolyte Abnormalities

TAGS:

Acid-Base Abnormalities

Albumin

Appropriate Renal and Endocrine Strategies

Arterial Blood Gas

Calcium

Chloride

Diagnostic Modalities

Electrolyte Abnormalities

Electrolyte Replacement as Appropriate

Electrolytes, Osmolarity, and Specific Gravity (Serum, Urine)

Magnesium

Management Strategies

Metabolic

Phosphorus

Potassium

Respiratory

Sodium
Ventilatory Support

IX.C. Specialized Areas

IX.C.1. Biostatistics

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

IX.C.2. Burns

TAGS:
Airway Management
Antimicrobials
Complications
Electrical Burns
Fluids and Resuscitation
Inhalation Injury
Management

IX.C.3. Disaster Management

TAGS:
Biologic, Chemical, and Nuclear Exposures
Epidemic

IX.C.4. Drowning, Fatal, Near-drowning

TAGS:
Fresh Water

IX.C.5. ICU Ethics

TAGS:
Brain Death
End-of-Life, Futility
Impaired Providers
Informed Consent
Living Will/Durable Power of Attorney/Healthcare Surrogate
Organ Donation
Palliative Care, Hospice
Patient Autonomy

IX.C.6. ICU Management and Organization

TAGS:
Clinical Care Bundles
Daily Wake-Up Test

Handover/Communication
Health Insurance Portability and Accountability Act (Privacy and Security)
Quality Assurance/Quality Improvement (Patient Safety)
Scoring Systems
Sedation/Analgesia/Delirium Assessment
Triage and Resource Utilization

IX.C.7. Infection Control

TAGS:

Catheter-Associated Infections
Environmental Exposures
General/Universal Precautions
Isolation Techniques
Nosocomial Infections
Pneumonia (Ventilator-Associated, Hospital-Associated, Etc.)
Reverse Isolation
Urinary Tract Infection (UTI), Catheter-Associated UTI

IX.C.8. Life Support and Resuscitation

TAGS:

ACLS
Other

IX.C.9. Nutrition Management

TAGS:

Enteral and Parenteral Nutrition (Formula, Caloric Intake)
Enteral Tubes
Refeeding Syndrome

IX.C.10. Assessment and Management of Pain, Sedation, and Delirium

TAGS:

Multimodal Analgesia
Opiate Management
Regional Analgesia Techniques
Sedation/Analgesia/Pain/Delirium Assessment

IX.C.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, Pharmacodynamics, and Drug Metabolism

Prophylactic Antimicrobials
Sedatives/Hypnotics
Spirochetal and Rickettsial
SSRIs
Tuberculosis
Tricyclic Antidepressants

IX.C.12. Poisonings, Toxic Ingestion, Overdoses, and Withdrawal
IX.C.13. Procedures

TAGS:

Airway
Arterial
Chest Tubes
Complications
Intraosseous
Laryngeal Mask Airways/Others
Physics of Ultrasound
Tracheostomy
Ultrasound
Vascular Access

IX.C.14. Thermoregulation

TAGS:

Environmental
Fever
Heat Stroke
Hyperthermia
Hypothermia
Malignant Hyperthermia
Neuroleptic Malignant Syndrome

X. PAIN MEDICINE

X.A. Background Concepts

X.A.1. Anatomy and Physiology: Mechanisms of Nociceptive Transmission

TAGS:

Autonomic Nervous System
Central Mechanisms: Spinal and Medullary Dorsal Horns
Central Mechanisms: Segmental and Brain Stem
Central Mechanisms: Thalamocortical
Peripheral Mechanisms: Somatosensory, Somatic, Visceral

X.A.2. Mechanisms of Pain Transmission and Modulation

TAGS:

Central Mechanisms and Implications for Treatment of Pain
Descending Inhibition and Facilitation, Pain Modulation
Mechanisms and Physiology of Somatic and Visceral Pain
Mechanisms of Acute Pain, Inflammatory, and Neuropathic Pain
Neurotransmitters Involved in Pain Modulation
Peripheral and Central Sensitization: Mechanisms and Implications

Peripheral Mechanisms of Pain Transmission and Modulation

Referred Pain

Synaptic Transmission of Pain in the Dorsal Horn

X.A.3. Interpreting Clinical Research Studies about Treatments for Pain

TAGS:

Epidemiology: Measurement of Burden in a Population, Including Epidemiologic

Measures of Occurrence (Prevalence, Incidence)

Epidemiology: Use of Data from Epidemiologic Studies of Pain

Epidemiology: Use of Risk Factors to Guide Treatment

Evaluating Study Results: Basic Concepts, Statistical Analysis, Reliability and Validity, Sensitivity and Specificity

Evaluating Study Results: Minimal Clinically Important Difference, Meta-Analysis,

Confounding Variables, Grades of Evidence, Influence of Bias

Principles of Clinical Trial Design: Inclusion/Exclusion Criteria, Use of Study

Instruments, Development of Hypothesis

Research Study Design - Cohort Studies: Use to Determine Natural History and Predictors of Outcome

Research Study Design - Correlational Studies, Case Reports, Retrospective Studies, Cross-Sectional Surveys

Research Study Design - 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

Research Study Design - Randomized Controlled Trials, Prospective, Experimental

X.A.4. Ethical Standards in Pain Management and Research

TAGS:

Conflicts of Interest and Financial Disclosure

Ethics of Pain Management and Research: Principles of Justice, Autonomy, Beneficence, Nonmaleficence

Informed Consent

Professionalism

X.A.5. Teamwork and Care Coordination

TAGS:

Importance of Coordination of Care

Participation in Quality Assurance, Identifying System Errors

Transitions of Care, Hand-Off Procedures

X.A.6. Legal and Regulatory Issues

TAGS:

Elements of Medical Malpractice: Duty, Breach of Duty, Causation, Damages

Legal Actions and Consequences: National Practitioner Data Bank, Closed Claims

Patient Privacy, Confidentiality, Health Insurance Portability and Accountability Act

Requirements for Reporting Impaired Healthcare Professionals

Understanding Laws Related to Controlled Substances

Workers Compensation, Disability Evaluations

X.B. Assessment of Pain

X.B.1. Assessment of Pain

TAGS:

Components of Pain Assessment: Basic Examination, Assessment of Function, Biopsychosocial Assessment

Measurement of Pain: Direct Pain Measurement - Self-Report, Indirect Pain Measurement - Observations

Pain Sensory Testing: Mechanical Allodynia, Cold and Warm Allodynia

Pain Sensory Testing: Pain Threshold, Pain Tolerance

Pain Sensory Testing: Quantitative Sensory Testing

Terminology: Hyperalgesia, Paresthesia, Spontaneous Pain, Evoked Pain, Allodynia, Anesthesia Dolorosa

X.B.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

Role of Placebo in Clinical Trials: Response Bias, Regression to Mean, Open-Hidden Paradigm

X.B.3. Assessment of Functional Outcomes and Disability

TAGS:

Environmental Factors: Social Attitudes, Workplace

Functioning and Disability: Body Functions, Impairment, Limitations and Restrictions

Personal Factors: Role of Family, Cultural Background, Social Factors

Validated Tools to Assess Functional Status

X.B.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 Treatment

Outcome, Maintenance of Treatment Effects

Individual Differences in Affective, Cognitive, and Behavioral Responses to Pain

Measurement: Screening Questionnaires, Validated Tools for Older or Cognitively Impaired Adults

Pain as a Biopsychological Experience: Definition and Measurement

Psychological Assessment: Role of Family, Financial Status, Cultural Beliefs

Role of Care Givers in Promoting Illness and Well Behavior

Role of Psychology, Physical and Occupational Therapy, Social Work

X.B.5. Sex, Gender, and Race Issues in Pain

TAGS:

Analgesic Response: Differences Between Sexes and Within the Same Sex

Definition of Sex and Gender

Sex Differences: Biologic and Psychosocial Contributions to Pain Response

Sex Differences: Nociceptive Response and Pain Perception

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

X.B.6. Imaging and Electrodiagnostic Evaluation

TAGS:

Electrical Nerve Stimulation (EMG/NCV/Evoked Potentials): Uses and Limitations

Electroencephalography (EEG, MEG): Uses and Limitations

Laser-Evoked Potentials: Uses and Limitations

MRI, Functional MRI, and Magnetic Resonance Spectroscopy: Uses and Limitations

Nuclear Medicine Bone Scan: Uses and Limitations

Positron Emission Tomography (PET) Scan: Uses and Limitations

Quantitative Sensory Testing: Uses and Limitations

Skin Punch Biopsy: Assessment of Innervation Density

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

X.C.1. Opioids

TAGS:

Adverse Effects: Opioid-Induced Hyperalgesia, Opioid Tolerance, Cognitive Effects, Impact on Driving, Effects on Endocrine, Immune, Cardiac, and Respiratory Systems

Effectiveness of Opioids: Evidence Base, Effect on Function

Federal Regulations Regarding Prescribing of Controlled Substances

Mechanism of Action on Pain Transmission and Modulation

Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, and Indications/Contraindications: Metabolism and Genetic Variability

Rationale for Opioid Rotation, Discontinuation of Opioids

Risk Assessment and Management of the Patient Taking Chronic Opioid Therapy

Route of Administration: Oral, Rectal, Transdermal, IV, Epidural, Spinal

Specific Drugs: Buprenorphine, Methadone, Morphine, Synthetic and Semi-Synthetic Opioids

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

TAGS:

Adverse Effects

Drug Interactions and Indications/Contraindications

Mechanism of Action

Pharmacokinetics, Pharmacodynamics, Pharmacogenomics

Specific Drugs

X.C.3. Antidepressants and Anticonvulsants

TAGS:

Anticonvulsants: Mechanism of Action

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

Anticonvulsants: Specific Drugs

Antidepressants: Mechanism of Action

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

Antidepressants: Specific Drugs

X.C.4. Other Analgesic Pharmacotherapy: Mechanism of Action, Pharmacokinetics, Pharmacodynamics, Adverse Effects, Drug Interactions, Indications/Contraindications

TAGS:

Alpha-2 Adrenergic Drugs (Clonidine, Tizanidine)

Antihistamines

Benzodiazepines

Botulinum Toxin

Cannabinoids

CNS Stimulants

Corticosteroids

Ketamine and NMDA-Receptor Antagonists

Local Anesthetics and Membrane-Stabilizing Drugs

Miscellaneous Analgesic Agents

Muscle Relaxants and Antispasticity Drugs

Neuroleptic Drugs

Other Vasoactive Drugs (Terazosin, Verapamil)

Sympatholytic Drugs

TRPV1 Agonists, Capsaicin and its Analogs

Ziconotide and Other Calcium Channel Blocking Drugs

X.D. Treatment of Pain: Procedural Treatments

X.D.1. General Considerations

TAGS:

Assessment of Infection Risk, Antibiotic Prophylaxis, Sterile Technique

Drug Selection: Steroids and Contrast Agents

Fluoroscopic Imaging and Radiation Safety

Indications and Appropriateness for Interventional Therapy

Preprocedural Factors and Evaluation of Health Status

Ultrasound Guidance: Basics, Techniques, Risks

X.D.2. Nonsurgical Stimulation-Produced Analgesia

TAGS:

Clinical Applications and Efficacy

Mechanisms

Peripheral Stimulation Techniques: TENS, Acupuncture, Vibration

X.D.3. Interventional Pain Management Including Nerve Blocks and Lesioning

TAGS:

Cranial Nerve Blocks and Ablation

Diagnostic and Treatment Purpose, Clinical Indications, Risks, Anatomy,

Pharmacology, and Use of Drugs

Facet Joint and Zygapophyseal Injectionsa

Intrathecal Blocks and Neurolysis

Musculoskeletal: Tendon, Ligament, and Intra-Articular Injections

Nerve Blocks and Neurolytic Techniques: Risks, Side Effects, Management of

Anticoagulation

Neuraxial Injections: Spinal, Epidural, Nerve Root Injections

Other Procedural Treatments for Pain

Peripheral Nerve Blocks (Including Genicular Nerve Blocks)

Radiofrequency Ablation: Lumbar, Cervical Indications

Radiofrequency Ablation: Lumbar, Cervical Techniques

Regional Tissue Plane Blocks: Transversus Abdominis, Erector Spinae, Serratus Plane,

Pectoralis Blocks, and Others

Sympathetic Ganglion and Plexus Blocks

Vertebral Augmentation: Indications, Risks, Benefits, Complications

X.D.4. Neuromodulation (Implanted Devices): Indications, Risks, Benefits, Complications

TAGS:

Implanted Stimulation Devices: Spinal Cord Stimulations, Dorsal Root Ganglion

Stimulation, Peripheral Nerve Stimulation

Other Neuromodulation Treatment of Pain

Spinal Drug Delivery Systems: Intrathecal Pumps and Infusions, Epidural Implants and Infusions

X.D.5. Neuroablative Pain Management: Indications, Risks, Benefits, Complications

TAGS:

Ablative Procedures: Cordotomy, Dorsal Root Entry Zone Lesioning, Neurolytic

Blocks

Brain, Brain Stem, Spinal Cord, Cervical/Thoracic/Lumbar, and Peripheral Nerve

Procedures

Intrathecal, Visceral, and Peripheral Nerve Neurolysis: Techniques, Drugs

Other Neuroablative Procedures for Pain

X.D.6. Regenerative Medicine: Clinical Uses and Evidence Base

TAGS:

Cellular Products (Lipoaspirate, Bone Marrow Aspirate, Umbilical Stem Cells, Platelet-Rich Plasma)

Environmental Products (Hyaluronic Acid, Tissue Engineering, Prolotherapy,

Replacement Discs)

Other Regenerative Pain Medicine

X.E. Treatment of Pain: Psychological, Physical, and Integrative Therapies

X.E.1. Cognitive Behavioral and Behavioral Interventions

TAGS:

Cognitive and Behavioral Strategies: Application to Specific Pain Syndromes (e.g.,

Temporomandibular Joint Pain, Neck and Back Pain, Fibromyalgia, Arthritis Pain, Burn Pain, Postoperative Pain)

Common Process Factors: Rapport, Engendering Hope, Therapeutic Alliance

Integration of Approaches: Cognitive Behavioral Treatments, Combined Behavioral and Drug Treatments; Economic Benefits of Integrating Treatment

Other Behavioral Interventions

Stages of Behavioral Change and Effect on Readiness to Adopt Self-Management Therapies: Solution-Focused, Mindfulness, Family, Hypnosis, Biofeedback

X.E.2. Mental Health Treatment

TAGS:

Anger in Chronic Pain Patients and Relation to Perceived Pain

Coping Styles: Definition and Effect on Pain Experience and Response to Treatment

Differential Diagnosis of Anxiety Disorders that May Augment Pain and Suffering

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)

Psychotherapy for Depressive Disorders: Cognitive Behavioral, Marital, Family, Interpretive, Group Therapy

Role of Biofeedback, Operant Therapy, Mindfulness, Cognitive Behavioral Therapy, Hypnosis, Relaxation

Role of Cultural and Environmental Factors: Effect on Treatment Outcome, Maintenance of Treatment Effects

Role of Education, Fear Avoidance, Self-Esteem, Self-Efficacy, Self-Control, Sick Role, Illness Behavior, and Individual Differences in Affective, Behavioral Response to Pain

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

X.E.3. Physical Medicine and Rehabilitation

TAGS:

Exercise Therapy

Orthosis Used for Pain Control: Peripheral Joints and Spine

Other Treatment of Pain (Methods): Physical Medicine and Rehabilitation

Physical Modalities: Manipulation, Mobilization, Massage, Traction

Role of Physiotherapy, Principles of Pacing, Graded Activity, Passive and Active Therapy, Manual Therapy

Temperature Modalities (e.g., Heat, Cold, Ultrasound)

X.E.4. 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

Multidisciplinary Approaches for Those Who Do Not Return to Work Within a Few Weeks (Active Exercise, Addressing Distorted Beliefs About Pain, Enhancing Coping Strategies, Promoting Self-Management)

Psychosocial Factors as the Main Determinants of Disability and as Predictors of Prolonged Work Absence, Work Rehabilitation, and Management of Return to Work

X.E.5 Complementary Therapies (CAM)**TAGS:**

Acupuncture: Clinical Outcomes and Evidence Base

Acupuncture: Techniques and Indications

Acupuncture: Treatment Principles and Practical Skills

CAM: Alternative Medical Systems (e.g., Traditional Eastern Medicine, Homeopathy, Acupuncture, Acupressure)

CAM: Biologically Based Therapies (e.g., Herbs, Foods, Vitamins), Energy Therapy

CAM: Manipulative Methods (e.g., Osteopathy, Chiropractic)

Evidence-Based CAM

Implications, Costs, and Side Effects (Including Drug Interactions) of CAM

Mind-Body Interventions (e.g., Yoga, Mindfulness, Meditation, Tai Chi)

Prevalence and Patient Reasons for Use of CAM

X.F. Clinical States: Taxonomy**X.F.1. Taxonomy of Pain Systems****TAGS:**

Application and Definition of Pain Terms

International Association for the Study of Pain (IASP) Classification of Chronic Pain Syndromes

X.F.2. Chronic Pain as a Symptom or a Disease

TAGS:

Chronic Primary Pain: Definition, Diagnostic Entities, Etiology

Chronic Secondary Pain: Definition, Diagnostic Entities, Etiology

Current Procedural Terminology (CPT): Basis of Reporting Medical Services

Location: Body System, Body Site

Pain Qualifiers: Severity, Interference, Psychological and Social Factors, Disability

X.G. Clinical States: Widespread Pain

X.G.1. Complex Widespread Pain

TAGS:

Central Sensitization Disorder

Chronic Pain Disorder with Somatic and Psychological Features

Illness Anxiety Disorder

Mechanisms: Somatization and Hypervigilance, Caused by Injury, Psychological, Infection, Immune System Disorder, Malingering

Somatic Symptom Disorder

X.G.2. Fibromyalgia

TAGS:

Associated Conditions: Irritable Bowel Syndrome, Headache, Cystitis, Chronic Fatigue

Criteria for Diagnosis: Tender Points, Fatigue, Sleep Problems, Mood Disturbance

Definition of Fibromyalgia, Myofascial Pain

X.H. Clinical States: Acute Pain, Pain due to Trauma, Postoperative Pain

X.H.1. Assessing and Monitoring Efficacy and Safety in the Postoperative Period

TAGS:

Clinical Outcomes to be Evaluated in an Organized Approach to Acute Pain Management

Epidemiology of Inadequate Control of Acute Pain

X.H.2. Central, Perineural, and Infiltrative Techniques

TAGS:

Neuraxial Opioids and Local Anesthetics

Regional Anesthetic Techniques

Use of Adjuvant Agents

X.H.3. Development of Chronic Post-Surgical Pain or Post-Traumatic Pain

TAGS:

After Amputation

After Burn Injury

After Nerve or Spinal Cord Injury

After Spinal Surgery

After Thoracotomy or Other Specified Area (Herniorrhaphy, Breast Surgery, etc.)

X.H.4. Interventions to Prevent the Development of Chronic Pain after Acute Pain

TAGS:

Epidemiology of Transition from Acute to Chronic Pain

Role of Regional or Neuraxial Analgesia

Role of Perioperative Opioid Management

X.H.5. Multimodal Analgesia for Optimal Perioperative Pain Management

TAGS:

Based on Available Expertise and Technology

Based on Patient Preference

Based on Physical and Mental Status

Formulation Based on Type and Cause of Pain

X.H.6. Nonpharmacologic Treatment

TAGS:

Role of Coping Skills

Role of Hot and Cold Packs

Role of Patient and Family Education

Role of TENS, Stimulation-Based Approaches

X.H.7. Pharmacologic Properties of Major Classes of Drugs Used for Acute Pain Management

TAGS:

Opioids, NSAIDs, Adjuvant Drugs, Local Anesthetics

Physiologic and Psychologic Effects: Identification and Control

Role of Acute Pain Management in Enhanced Recovery (ERAS) Pathways

X.H.8. Tools for Assessment and Management of Acute Pain

TAGS:

Assessment and Management of Older Patients, Delirium

Assessment and Management of Pain in Children

Assessment and Management of Vulnerable Populations

Outcome Measures

X.H.9. Treatment of Special Populations for Acute Pain

TAGS:

Opioid-Tolerant Patients

Patients with Chronic Pain

Patients with Renal/Hepatic Comorbidities

Pregnant or Breastfeeding

Spinal Cord Injury

Treatment of Nonsurgical Pain: Burns, Sickle Cell Disease

X.I. Clinical States: Musculoskeletal Pain

X.I.1. Cervical Spinal Pain

TAGS:

Anatomy

Causes and Differentiation from Neck Pain and Somatic Nerve Pain

Central Neuromodulation and Intrathecal Drug Delivery

Electrodiagnostic Studies: Reliability and Validity

Evidence for Commonly Used Treatments

History Taking and Physical Examination: Role and Limitations
Injection Therapy: Indications, Use, and Complications
Interventions Commonly Used for Acute and Chronic Neck Pain: Evidence for Efficacy
Mechanisms of Referred Pain: Cervicogenic Headache
Medical Imaging: Uses, Limitations, Reliability and Validity
Natural History and Relevance to Management, Including Whiplash Injury
Nonsurgical Intervention: Evidence for Efficacy of Reassurance, Maintaining Activity, and Exercises – Psychological, Physical and Multidisciplinary Therapy, Complementary Therapies
Pharmacotherapy: Uses and Limitations
Public Health Dimensions: Prevalence, Demography, Personal and Societal Costs
Risk Factors: Transition to Chronic Pain, Predictors of Chronicity
Surgical Treatment: Indications and Use, Including Indications for Urgent Surgical Referral

X.I.2. Lumbar Spinal Pain

TAGS:

Anatomy
Causes and Differentiation of Low Back Pain and Referred Somatic Pain from Radicular Pain, Radiculopathy, and Sciatica; Relevance to Investigation and Treatment
Central Neuromodulation and Intrathecal Drug Delivery
Electrodiagnostic Studies: Reliability and Validity
Evidence for Commonly Used Treatments
History Taking and Physical Examination: Role and Limitations
Injection Therapy: Indications, Use, and Complications
Interventions Commonly Used for Acute and Chronic Low Back Pain: Evidence for Efficacy
Mechanisms of Referred Pain: Radicular Pain
Medical Imaging: Uses, Limitations, Reliability and Validity
Natural History and Relevance to Management: Etiologic and Prognostic Risk Factors
Nonsurgical Intervention: Evidence for Efficacy of Reassurance, Maintaining Activity, and Exercises – Psychological, Physical and Multidisciplinary Therapy, Complementary Therapies
Pharmacotherapy: Uses and Limitations
Psychosocial and Occupational Factors Related to Low Back Pain and Chronicity
Public Health Dimensions: Prevalence, Demography, Personal and Societal Costs
Risk Factors: Transition to Chronic Pain, Predictors of Chronicity
Surgical Treatment: Indications and Use, Including Indications for Urgent Surgical Referral

X.I.3. 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: Chronic Musculoskeletal Pain Due to Inflammation, Associated with Structural Changes, Associated with Diseases of the Nervous System
Examination: Multidisciplinary Assessment, Functional Assessment
Mediators of Inflammation, Tissue Destruction, and Repair
Natural History and Relevance to Management: Etiologic and Prognostic Risk Factors
Public Health Dimensions: Prevalence, Demography, Personal and Societal Costs
Risk Factors: Transition to Chronic Pain, Predictors of Chronicity
Treatment and Rehabilitation of Musculoskeletal Pain/Disability: Self-Management, Exercise and Rehabilitation, Pharmacologic and Nonpharmacologic Approaches

X.I.4 Hereditary Connective Tissue Diseases

TAGS:

Anatomy: Connective Disease Structures, Mechanisms of Pain
Clinical Characteristics and Assessment: Dislocation, Trauma, Tissue Fragility
Diagnosis: Ehlers-Danlos Syndrome, Joint Hypermobility Syndrome, Marfan Syndrome
Examination: Gait Analysis, Orthostatic Blood Pressure, Joint/Muscle Exam
Natural History and Relevance to Management: Predictors of Chronicity
Prevalence and Epidemiology of Conditions
Risk Factors: Etiologic and Prognostic
Treatment of Pain: Self-Management, Exercise, Pharmacologic, Nonpharmacologic

X.J. Clinical States: Cancer Pain

X.J.1. Analgesic Approach: Indications, Risks, Pharmacologic Properties, Therapeutic Guidelines

TAGS:

Adjuvant Analgesics: Bisphosphonates, Steroids, Ketamine, Anticonvulsants, Antidepressants, Barbiturates, Cannabinoids
Adverse Effects of Analgesics, Medication Interactions
Route of Administration: Oral, Transdermal, IV, Intrathecal
WHO Ladder: Choice of Analgesics, Limitations

X.J.2. Chronic Cancer Pain: Diagnosis, Etiology, Mechanisms

TAGS:

Bone Cancer Pain
Neuropathic Cancer Pain
Visceral Cancer Pain

X.J.3. Chronic Cancer Pain Due to Treatment

TAGS:

Chemotherapy-Induced Polyneuropathy

Mucositis

Post-Cancer Surgery Pain

Radiation-Induced Neuropathy

X.J.4. Palliative Care: Definition and Scope

TAGS:

Advance Care Directives

Barriers to Treatment

Frequency of Pain and Multiple Sites of Pain

Hospice and Multidimensional Treatments

Importance of Development of Evidence-Based Practice

X.J.5. Comprehensive Evaluation of Patients with Cancer Pain: Needs and Approaches

TAGS:

Addressing End-of-Life Symptoms: Nausea, Respiratory Distress, Fatigue

Social and Cultural Influences

Value of Interdisciplinary Teams

X.J.6. Principles of Treatment

TAGS:

Integration of Other Modalities: Physical, Psychological, and Anesthetic

Management of Acute Cancer Pain

Treatment of Underlying Disease

X.J.7. Interventional Approaches: Indications, Risks, Practical Implications

TAGS:

Injections and Neurolysis

Intrathecal Therapy

Role of Primary Cancer Therapy

Surgical Approaches

X.J.8. Multidisciplinary Management and Special Situations

TAGS:

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

Physical Therapy: Indications, Utility, and Effectiveness

Psychological Approaches: Indications, Utility, and Effectiveness

Treatment of Persistent Pain in Cancer Survivors

X.J.9. Ethical Issues in Cancer Pain Management

TAGS:

Benefit to Burden Ratio: Variation According to Stage

Prognosticating Life Expectancy

Physician-Assisted Suicide, Euthanasia, Double Effect, Intent

X.K. Visceral Pain

X.K.1. Chronic Abdominal Pain

TAGS:

Anatomy: Organization of Peripheral and Central Visceral Innervation, Properties of Visceral Nociceptors, and Mechanisms of Visceral Nociceptor Sensitization

Classification of Chronic Visceral Pain Disorders: From Persistent Inflammation, Vascular Mechanisms, and/or Mechanical Factors

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

Management of Visceral Pain: Pharmacotherapy, Physical Therapy, Psychological Therapies, Interventional Techniques

Peripheral and Central Mechanisms of Visceral Pain Modulation

Psychological Principles in Clinical Assessment, Explanation, and Treatment

X.K.2. Chronic Pelvic Pain

TAGS:

Anatomy

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

Epidemiology

Management of Pelvic Pain: Pharmacotherapy, Physical Therapy, Psychological Therapies, Interventional Techniques

Psychological Principles in Clinical Assessment, Explanation, and Treatment

X.L. Headache and Orofacial Pain

X.L.1. Headache

TAGS:

Anatomy and Physiology

Classification of Headache Disorders: Primary Headache (Migraine, Tension, Cluster, Paroxysmal Hemicrania, Hemicrania Continua)

Classification of Headache Disorders: Secondary Headache (Trauma, Vascular Disorder, Non-Vascular Intracranial Disorder, Due to Substance or its Withdrawal, Infection)

Critical Factors for Life-Threatening Headache

Diagnosis and Management of Post Dural Puncture Headache

Evaluation: Systematic Case History, Use of Headache Diary, Selection of Appropriate Examination Based on History

Indications for Further Investigation of Headache

Internationally Accepted Diagnostic Criteria for Classification of Headache Disorders

Major Hypotheses About Mechanisms

Mechanisms and Pathophysiology

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

Treatment and Management of Headache: Pharmacologic, Nonpharmacologic, Prophylaxis, Interventional Techniques, Multidisciplinary Management

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

TAGS:

Anatomic, Physiologic, Psychosocial Aspects

Classification of Orofacial Pain: Primary (Temperomandibular Disorders, Trigeminal Neuralgia, Atypical Facial Pain, Burning Mouth Syndrome)

Classification of Orofacial Pain: Secondary (Disorders of the Cranium, Dental Pain, Neuropathic Pain, Secondary Temperomandibular Disorders)

Evidence-Based Treatment Options

History Taking, Physical Examination, and Diagnostic Studies

Treatment and Management: Pharmacologic, Surgical Options, Ablation and Stimulation Techniques, Cognitive Behavioral Therapy, Physiotherapy, Brain Stimulation

X.M. Neuropathic Pain

X.M.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 Definition, Anatomy, and Epidemiology

Evaluation: Clinical, Electrodiagnostic, Laboratory, and Radiographic Findings

Evaluation: Differential Diagnosis, Assessment Tools

Mechanisms and Pathophysiology: Peripheral Nerve Injury, Compression Neuropathy, Amputation

Therapeutic Modalities: Pharmacologic, Interventional, Rehabilitative

X.M.2. Complex Regional Pain Syndrome

TAGS:

Definition, Anatomy, and Epidemiology

Evaluation and Clinical Assessment

Mechanisms and Pathophysiology

Therapeutic Modalities: Pharmacologic, Interventional, Rehabilitative

X.M.3. 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, Anatomy, and Epidemiology
Evaluation: Differential Diagnosis, Assessment Tools
Evaluation: Clinical, Electrodiagnostic, and Radiographic Findings
Mechanisms and Pathophysiology: Pathologic Mechanisms in Nervous System
Therapeutic Modalities: Pharmacologic, Interventional, Rehabilitative

X.N. Special Cases

X.N.1. Pain in Infants, Children, and Adolescents

TAGS:
Acute and Chronic Pain in Children and Adolescents: Special Considerations in Management/Palliative Care
Consequences of Pain in Infancy and Childhood
Differences Among Infants, Children, Adolescents, and Adults
Ethics of Treatment of Pain and Research 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)

X.N.2. Pain in Older Adults

TAGS:
Access to Care
Age-Related Changes: Ischemia, Degeneration, Dementia
Age-Related Changes in Pharmacology (e.g., Drug-Drug Interactions, Clearance, Coexisting Disease)
Common Conditions: Bone Pain, Neuralgic Pain, Visceral Pain
Epidemiology: Prevalence, Onset, Burden, Risk Factors, Prognosis
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: Tools and Limitations, Assessment of Physical Activity, Quality of Life
Procedural Techniques: Evidence Base
Psychosocial Interventions: Cognitive Behavior Therapy in Older Adults

X.N.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

X.N.4. Pain Relief in Persons with Opioid Tolerance, Substance Use, and/or Addictive Disorders

TAGS:

Acute Pain Management of Patients with Substance Use Disorder

Biopharmacologic and Neurophysiologic Basis of Addiction

Definitions: Tolerance, Dependence, Addiction, Dual Diagnosis, Substance Use Disorder

Description of Impact of Misuse: Intoxication and Withdrawal

Interactions Between Addiction, Substance Use Disorder, and Pain

Interpretation of Drug Toxicology Testing

Legal, Regulatory, and Reimbursement Issues When Prescribing Controlled Substances to Patients with Pain and Substance Use Disorder

Needs of Special Populations: Pregnant Women, Neonates, Cancer Patients

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 or Who Take Other Psychoactive Substances

Risk Assessment for Substance Use Disorder and Addiction in Patients with Pain

Screening and Referral for Substance Use Disorder in Patients with Pain

X.N.5. Chronic and Acute Pain in Pregnancy and Lactation

TAGS:

Causes of Pain during Pregnancy

Factors Influencing Perception of Pain in Pregnancy

Management of Opioids During Pregnancy Including Neonatal Abstinence

Pharmacologic Management of Pain in Pregnancy and Lactation

Principles of Pain Management in Pregnancy

X.N.6. Pain Relief in Areas of Deprivation and Conflict

TAGS:

Access to Analgesic Drugs and Palliative Care Worldwide

Causes of Pain Worldwide

Education, Training, and Knowledge of Pain Worldwide

Ethical and Political Issues in Pain Management Worldwide

Spectrum of Providers Caring for Patients with Pain Worldwide

Variability of Availability and Access to Pain Treatment Worldwide

X.N.7. Pain Assessment and Management in Special Populations

TAGS:

Patients from Diverse Socioeconomic, Ethnic, Cultural Backgrounds

Patients with Hepatic or Renal Function Impairment

Patients with Mental Health Diseases

Patients with Physical Disabilities

X.N.8. Diversity, Equity, and Inclusion (DEI) in Health Care

TAGS:

Approaches to Improvement: Individual, Community, Policy
Barriers: Systematic Discrimination, Bias, Implicit Bias
DEI in the Workplace and in Academia

X.N.9. Healthcare Disparities

TAGS:

Child and Adolescent Healthcare Disparities
Maternal Healthcare Disparities
Social Determinants of Health: Race, Language, Education Status, and Others

X.N.10. Ethics and Medicolegal Issues in Clinical Practice

TAGS:

Clinician Wellness and Self-Care: Burnout, Sleep Deprivation, Adaptations for Disability, Substance Use
Healthcare Provider Certification, Maintenance of Certification, Professional Standing, Clinical Practice Assessment
Patient Autonomy and Decision-Making: Principles of Informed Consent, Advance Directives, Do-Not-Resuscitate Orders, Health Care Proxy, Patient Refusal of Treatment
Professionalism: Disclosure of Errors, Recognizing Limitations, Reporting Unsafe Conditions, Responding to Unprofessional Behavior
Research Ethics: Standards in Research Design, Informed Consent, Financial Disclosure, and Conflicts of Interest

X.N.11. Practice Management

TAGS:

Clinical Informatics: Electronic Medical Record Systems, Artificial Intelligence
Costs of Healthcare: Understanding Funding and Payment, Cost-Conscious Practice
Documentation, Coding, and Billing: Compliance, Accuracy, Coding Integrity
Efficient Practice Staffing and Scheduling
Population Health: Resources to Improve Access

X.N.12. Quality Improvement and Patient Safety

TAGS:

Barriers to Patient Safety and Quality Improvement (QI) Implementation
Change Management Methods: Peer Review, Morbidity and Mortality Conferences, Lean Six Sigma, QI Process, Value Stream Mapping, Failure Mode, and Root Cause Analysis
Crisis Management and Teamwork: Simulation Training, Handoffs, Checklists
Definitions: Medical Error, Adverse Events, Sentinel Events
Medication Errors: Assessment and Prevention, Reconciliation, Use of Technology
Performance Assessment: Individual Benchmarks, Facility Scorecards, Public Reporting

XI. PEDIATRIC ANESTHESIOLOGY

XI.A. Basic Science

XI.A.1. Anatomy

TAGS:

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

XI.A.2. Physics and Anesthesia Equipment

TAGS:

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

XI.A.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
- Inotropic Medications
- Local Anesthetics
- Neuromuscular Blocking and Reversal Agents
- Non-Opioid Analgesics
- Opioid Analgesics

Pharmacogenetics
Pharmacokinetics and Pharmacodynamics
Sedative and Anxiolytic Agents
Sympathetic and Parasympathetic Agents
Vasodilator Medications

XI.B. Organ-Based Basic and Clinical Sciences

XI.B.1. Respiratory System

TAGS:

Acute Respiratory Distress Syndrome (ARDS)
Airway-Pressure Release Ventilation (APRV)
Anatomy and Physiology
Anesthesia for Thoracic Procedures
ARDS: Barotrauma and Volutrauma
ARDS: Clinical Phases
ARDS: Etiology, Infectious and Noninfectious
ARDS: Permissive Oxygenation
ARDS: Treatment
Chest Wall Surgery/Reconstruction
Clinical Sciences
Congenital Pulmonary Airway Malformation (CPAM)
CPAP
Heliox
High-Flow Nasal Canula
High-Flow Oscillatory Ventilation (HFOV)
Lung Physiology
Mediastinal Masses
Musculoskeletal
Nitric Oxide
Noninvasive Positive-Pressure Ventilation (PPV)
Obstructive Disease
One Lung Ventilation
Oxygen Transport
Oxygenation Index
Prenatal and Postnatal Development
Respiratory Mechanics, Ventilation, and Lung Volumes
Restrictive Disease
Surfactant and Surface Tension
Tracheobronchial
Upper Airway
Ventilation
Ventilation/Perfusion Matching
Video-Assisted Thoracoscopy

XI.B.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
Cardiogenic Shock
Cardiomyopathies
Cardiopulmonary Resuscitation and PALS
Cardiovascular Effects on Anesthetic Uptake and Delivery
Clinical Science
Cyanotic Lesions
Disease States
Dissociative Shock: Azotemia, Hyperlactatemia, and Metabolic Acidosis
Distributive Shock
Fetal, Transitional, and Adult Circulation
Fluid Resuscitation
General Considerations
Heart Transplantation
Hypertensive Crisis
Hypovolemic Shock
Infectious Diseases
Intracardiac Masses
Mechanical Circulatory Support- ECMO
Obstructive Shock
Palliative Procedures
Pericardial Disease
Postcardiac Arrest Syndrome
Postcardiac Arrest Syndrome: Metabolic Abnormalities
Prenatal and Postnatal Development
Pulmonary Hypertension
Return of Spontaneous Circulation (ROSC)

XI.B.3. Central and Peripheral Nervous Systems

TAGS:

Anatomy and Physiology
Anesthesia for Neurosurgical Procedures
Clinical Science
Complications: Seizures and Level of Consciousness (LOC)
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
Pharmacology of Diuretics, Steroids, and Anticonvulsant Medications
Prenatal and Postnatal Development
Preoperative Anxiety, Postoperative Behavior, and Emergence Delirium
Seizure Surgery
Serotonin Syndrome
SMART Tots Consensus Statement And Animal Studies

XI.B.4. Gastrointestinal System

TAGS:

Abdominal Wall Defects
Atresias, Stenoses and Webs
Esophageal/Gastrointestinal Foreign Bodies
Esophageal, Stomach and Intestine Disorders
Hernias
Liver, Biliary Tract and Spleen Disorders
Severe Obesity/Bariatric Surgery
Necrotizing Enterocolitis

XI.B.5. Renal/Urinary

TAGS:

Clinical Science
Prenatal and Postnatal Development
Renal Failure

XI.B.6. Endocrine/Metabolic

TAGS:

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

XI.B.7. Hematology/Oncology

TAGS:

Anemias
Anterior Mediastinal Mass

Bone Marrow and Stem Cell Transplants
Chemotherapeutic Agents and Side Effects
Coagulation Disorders
Hematology
Radiation Therapy
Sickle Cell Disease
Tumor Lysis Syndrome

XI.B.8. Genetics

TAGS:

Craniofacial Syndromes
Genetic Abnormalities
Inborn Errors of Metabolism
Malignant Hyperthermia
Mitochondrial Myopathies
Muscular Dystrophies
Myopathic Disorders and Myotonias
Osteochondrodysplasia Symptoms
Skin and Connective Tissue Disorders
Trisomy 21

XI.C. Clinical Subspecialties

XI.C.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

XI.C.2. Painful Disease States

TAGS:

Chronic Pain States
Pain Management in the NICU
Pathophysiology
Pharmacologic and Non-Pharmacologic Techniques of Pain Management
Regional Analgesia
Treatment

XI.C.3. Otolaryngology

TAGS:

Airway Procedures

Bronchoscopic Procedures
Choanal Atresia Repair
Cochlear Implant, Tympanoplasty, and Mastoidectomy
Laser Procedures
Myringotomy and Tubes
Obstructive Sleep Apnea (OSA)
Otologic Procedures
Tonsillectomy, Adenoectomy, and Abscess Drainage
Tracheotomy

XI.C.4. Plastic and Oral-Maxillary Facial Surgery

TAGS:

Cleft Repairs
Mandibular Repairs
Vascular Malformations

XI.C.5. Ophthalmology

TAGS:

Clinical Science
General Considerations
Pharmacology of Ophthalmologic Medications
Strabismus Repair
Trauma

XI.C.6. Orthopedic Surgery

TAGS:

Anterior, Posterior, and Combined Spine Fusion
Clinical Science

XI.C.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

XI.C.8. Nutritional Support in the PICU

TAGS:

Electrolyte Disorders
Enteral Feedings: Gastric and Post-Pyloric
Free Fatty Acid Deficiency

Glycemic Control in the PICU
Hyperglycemia
Liver Dysfunction
NPO for Children on Enteral Feedings
Risk of Aspiration
Total Parenteral Nutrition (TPN)

XI.C.9. Liver Dysfunction

TAGS:
Biochemical Guidance of Liver Injury
Coagulopathy
Hepatic Encephalopathy
Hepatorenal Syndrome
Hyperdynamic Circulatory Failure
Liver Transplantation
Pediatric Acute Liver Failure (PALF)
Rapidly Progressive Multisystem Organ Failure
Systemic Inflammatory Response Syndrome (SIRS)

XI.C.10. Acute Kidney Injury

TAGS:
Acute Hyperkalemia
Acute Tumor Lysis Syndrome
Biomarkers
Continuous Renal Replacement Therapy
Intermittent Hemodialysis
Peritoneal Dialysis
Renal Replacement Therapy (RTT)

XI.C.11. Transfusion Practices

TAGS:
Anemia
Hemolytic Transfusion Reactions
Transfusion Related Acute Lung Injury (TRALI)
Transfusion Triggers
Transfusion-Associated Circulatory Overload (TACO)
Transfusion-Associated Risks

XI.D. Clinical Science of Anesthesia

XI.D.1. Evaluation and Preoperative Preparation of the Pediatric Patient (See Specific Disease States)

TAGS:
Autism Spectrum Disorders
Chronic Corticosteroid Use (Stress Dosing)
Concussion
Evaluation of Coexisting Disease

Fasting Requirements
General Considerations
GLP-1 Agonists
Home Medication Administration
Informed Consent and Assent (Assent for Minors)
Laboratory Testing
Normal Developmental Milestones
Parental Presence and Pharmacologic Preparation for Anesthetic Induction
Point-of-Care Ultrasonography
Pregnancy Testing
Preoperative Anesthesia Clinic
Preoperative Physical Examination
Psychosocial Preparation of the Patient and Family
Role of Child Life Services (Scope of Practice, Utility)
Subacute Bacterial Endocarditis (SBE) Prophylaxis
Suitability for Anesthesia at an Outpatient Center
Upper Respiratory Tract infections

XI.D.2. General Considerations of the Perioperative Period

TAGS:

Age and Weight Implications
Airway Management Devices and Adjuncts
ASA Difficult Airway Algorithm
Considerations for Postoperative Admission and Disposition
Extubation Criteria
Fluid, Electrolyte, and Glycemic Management
Induction Technique
Monitors and Equipment
Point-of-Care Testing
Thermoregulation
TIVA
Transfusion Therapy and Blood Conservation Techniques

XI.D.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

XI.D.4. General Anesthesia

TAGS:

Bradycardia on Mask Induction
Intraoperative Airway Fire

Intraoperative Blood Product Transfusion Error
Intraoperative Increased Airway Pressure
Intraosseous Access
LAST
Line Isolation Monitor
Management of Anesthesia Machine Fault
Management of the Difficult Airway
Management of Intraoperative Bronchospasm
Management of Intraoperative Rhabdomyolysis
Management of PEA/Asystole
Management of Supraventricular Tachycardia
Management of Ventricular Fibrillation
Oculocardiac Reflex
Pediatric Massive Transfusion Protocol
Recognition and Management of Cardiac Arrest
Recognition and Management of Malignant Hyperthermia
Recognition and Management of Pseudocholinesterase Deficiency
Wake-up Test for Loss of Neuromonitoring

XI.D.5. Complications of Anesthesia

TAGS:

Airway Obstruction
Anaphylactic and Anaphylactoid Reactions
Awareness and Recall under Anesthesia
Cardiopulmonary Resuscitation
Disposition
Dysrhythmias
Emergence Delirium
Iatrogenic Drug Errors
Iatrogenic Trauma/Positioning Injury
Inadequate Vascular Access
Respiratory Failure/Hypoxia
Surgical Site Infection

XI.D.6. Special Techniques and Situations

TAGS:

Non-Operating Room Anesthesia (NORA)
Transition of Patient Care

XI.D.7. Postoperative Period

TAGS:

Management and Diagnosis of Pain, Anxiety and Emergence Agitation
PONV

XI.D.8. Acute and Chronic Pain Management

TAGS:

Enhanced Recovery after Surgery (ERAS)

Opioid Induced Hyperalgesia

Opioid Tolerance

XI.E. Special Problems or Issues

XI.E.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

XI.E.2. Principles of Biostatistics and Study Design

XII. ADULT CARDIAC ANESTHESIOLOGY

XII.A. Foundations of Adult Cardiac Anesthesiology

XII.A.1. Anatomy and Physiology

TAGS:

Anatomical Landmarks for Regional Anesthesia (e.g., PECS or ESP Blocks)

Baroreceptor Function

Blood Pressure

Blood Volume and Distribution

Cardiac Conduction

Cardiac Output Measurements (e.g., PA, TEE, Fick Principle)

Central: Vasomotor Center/Hypothalamic-Pituitary-Adrenal Axis

Coronary Circulation

Myocardial Contractility

Myocardial Oxygen Utilization and Balance

Peripheral: Receptors and Reflexes

Regulation of Circulation and Blood Volume

Synchronicity of Pressure, Flow, ECG, Valvular Function

Systemic and Pulmonary Vascular Resistance

Systolic, Diastolic, Mean and Perfusion Pressures

Vascular Compliance/Venous Capacitance

Venous Return

Ventricular Function

XII.B. Cardiothoracic Diseases (Pathophysiology, Pharmacology, and Clinical Management)

XII.B.1. Cardiac Disease

TAGS:

Acquired (e.g., Aortic Sclerosis)

Acute Heart Failure

Acute vs. Chronic Heart Failure

Amyloidosis

Anatomy of the Cardiac Conduction System

Anesthetic Considerations

Anesthetic Management and Goals
Aortic Stenosis/Insufficiency: Risk Factors, Pathophysiology, Pharmacological Management, Interventional Cardiology Management, Surgical Management
Arrhythmia Classification: Atrioventricular Nodal Reentrant Tachycardia, Focal Atrial Tachycardia; Atrial Fibrillation, Atrial Flutter; Supraventricular Tachycardia; Ventricular Tachycardia; Ventricular Fibrillation
Arrhythmogenic Right Ventricular Dysplasia
AV Junction
Cardiac Masses
Carcinoid
Cardiac Catheterization
Cardiac Enzymes
Cardiac Imaging: MRI/CT
Cardiac Resynchronization Therapy/Pacemaker/ICD
Cardiac Tamponade
Cardiomyopathy
Chronic Heart Failure
Clinical Presentation
Common Congenital Lesions (e.g., Tetralogy of Fallot, Bicuspid Aortic Valve, ASD, VSD)
Congenital (e.g., Bicuspid Aortic Valve, Ebstein Anomaly)
Congenital Heart Disease
Determinants of Myocardial Oxygen Requirements and Delivery, Silent Ischemia, Postoperative Ischemia
Diagnosis (e.g., TEE, POCUS, CVP, PAC, CXR, Cardiac MRI, Laboratory Markers)
Diagnosis of Severity of Myocardial Infarction and Acute Coronary Syndrome
Diastolic (Heart Failure with Preserved Ejection Fraction)
Dilated Cardiomyopathy
Drug Related (e.g., Anthracycline, Serotonin, Ergotamine)
ECG, Holter, Implantable Loop Recorder
Echocardiographic Findings in Heart Failure with Preserved/Reduced Ejection Fraction
Echocardiography
Electrophysiologic Disturbances and EP Studies
Fabry Disease
Fatty Infiltration
Fontan Physiology
Glycogen Storage Disease
Hemochromatosis
Hypereosinophilic Disease
Hypertrophic Obstructive Cardiomyopathy
Implantable Cardioverter-Defibrillators, Pacemakers: Guidelines for Insertion
Indications for: Revascularization/Valvular Surgery, Mechanical Circulatory Support (e.g., IABP, VAD, etc.), Heart Transplant

Intraventricular Conduction
Ischemic Heart Disease
Ischemic v. Nonischemic
Left Bundle Branch (Anterior/Posterior Fascicles)
Mechanical Circulatory Support – Durable and Percutaneous
Mechanisms of Arrhythmias
Medical/Interventional Management
Mitral Stenosis/Insufficiency: Risk Factors, Pathophysiology, Pharmacological Management, Interventional Cardiology Management, Surgical Management
Neoplastic Diseases
Normal and Abnormal Embryological Development
Noncompaction Cardiomyopathy
Nuclear Techniques
Others (e.g., Idiopathic, Peripartum)
Perioperative Management of the Adult with Congenital Heart Disease: Corrected, Uncorrected
Pharmacological Interventions
Pulmonary Hypertension
Pulmonic Stenosis/Insufficiency: Risk Factors, Pathophysiology, Pharmacological Management, Interventional Cardiology Management, Surgical Management
Radiation
Rare Cardiac Diseases (e.g., Infiltrative, Storage, Endomyocardial Disease)
Restrictive
Right Bundle Branch
Risk Factors
Sarcoidosis
Septal Ablation/Myomectomy
Sinus Node
Stress Tests
Surgical Intervention: Pericardiocentesis, Pericardial Window
Surgical Interventions
Systolic (Heart Failure with Reduced Ejection Fraction)
TEE Findings and Assessment of Valvular Heart Disease
TEE Findings Associated with Cardiomyopathy
Toxicity
Transplant
Treatment: Pharmacological, Interventional Cardiology Procedures, Surgical Revascularization, Mechanical Circulatory Support (e.g., IABP, VAD), Ablations, Transplant
Tricuspid Stenosis/Insufficiency: Risk Factors, Pathophysiology, Pharmacological Management, Interventional Cardiology Management, Surgical Management
Valvular Heart Disease
Viral

XII.B.2. Thoracic Vascular Disease

TAGS:

Aneurysmal Disease
Arterial Insufficiency/Thoracic Outlet Obstruction
Atherosclerotic Disease
Cerebrospinal Fluid Drains
Dissection/Disruption
Endovascular Procedures
Lung Isolation
Open Surgical Procedures
Others
Pathophysiology/Classification
Postoperative Complications
Recurrent Laryngeal Nerve Injury
Renal Failure
Specific Anesthetic Considerations
Spinal Cord Ischemia
SSEP Monitoring

XII.B.3 Esophageal Disease

TAGS:
Impact for Echocardiography

XII.C. Patient Evaluation

XII.C.1. Noninvasive Cardiovascular Evaluation

TAGS:
Cardiovascular Imaging (e.g., MRI, CT)
Electrocardiography
Myocardial Nuclear Scintigraphy
Stress Testing (e.g., Exercise, Dobutamine)

XII.C.2. Cardiac Catheterization Procedures and Diagnostic Interpretation

TAGS:
Invasive Cardiac Catheterization Procedures

XII.C.3. Pre-anesthetic Evaluation and Preparation of Adult Cardiothoracic Patients

TAGS:
Risk Models (e.g., STS)
Specific Risk Conditions

XII.D. Perioperative Imaging and Monitoring

XII.D.1. Transesophageal Echocardiography

TAGS:
3-Dimensional Imaging
Artifact Recognition
Complications and Safety
Echocardiographic Anatomy: Chambers, Valves, Great Vessels, Pericardium
Properties and Physics of Ultrasound and Doppler
Standard TEE Views and Comprehensive Examination
Structural Heart Interventions
TEE Image Acquisition and Optimization
Vascular Anatomy and Pathology

XII.D.2. Transthoracic Echocardiography and POCUS

XII.D.3. Vascular Pressures

TAGS:

- Arterial
- Central Venous (CVP)
- Invasive/Noninvasive Differences
- Left Atrial (LAP)
- Left Ventricular End-Diastolic (LVEDP)
- Pulmonary Arterial (PAP)
- Pulmonary Artery Occlusion (PAOP)
- Pulse Pressure Variation
- Site Specific Indications/Contraindications and Limitations

XII.D.4. Heart Function

TAGS:

- Cardiac Catheterization, Cardiac MRI
- Cardiac Output
- Cardiac Preload Assessment and Monitoring
- Cardiac Valve Anatomy and Function
- Doppler
- Echocardiography
- Electrocardiogram (ECG)
- Esophageal Doppler
- Ischemic Changes
- PAC
- Regional and Global Myocardial Function
- TEE
- Thoracic Impedance

XII.D.5. Mixed Venous Oxygen Saturation (SvO_2)

XII.D.6. Cerebral Oximetry

XII.D.7. Peripheral Oximetry

XII.D.8 Coagulation

XII.D.9 Temperature

TAGS:

- Cardiopulmonary Bypass Considerations

XII.D.10. Urine Output

XII.D.11. ABG Interpretation

TAGS:

- Anion Gap

Temperature Effect on Blood Gases: Alpha-Stat vs. pH-Stat

XII.D.12. Cerebrospinal Fluid Pressure

XII.E. Pharmacodynamics and Pharmacokinetics

XII.E.1. Preoperative Medications

XII.E.2. Anesthetic Induction Agents in Patients with Cardiac Disease

XII.E.3. Medications Prescribed for Management of Hemodynamic Instability

TAGS:

- ACE-I/ARBs
- Beta-Blockers
- Calcium Channel Blockers
- Diuretics
- Inhaled (e.g., Nitric Oxide, Prostaglandin)
- Inotropes
- Intravenous (e.g., Nitrates, Phosphodiesterase Inhibitors)
- Vasodilators
- Vasopressors

XII.E.4. Other Perioperative Medications

TAGS:

- GLP-1 Agonists
- SGLT-2 Inhibitors

XII.F. Devices

XII.F.1. Cardiopulmonary Bypass (CPB)

TAGS:

- Cardiothoracic Effects
- Cardioplegia
- Circulatory Arrest
- Coagulation/Anticoagulation Before, During, and After CPB
- CPB on Pharmacokinetics and Pharmacodynamics
- Endocrine Effects
- Hematological Effects
- Metabolic Effects
- Myocardial Preservation
- Neurological Effects
- Renal Effects
- Respiratory Effects
- Thermoregulatory Effects

XII.F.2 Circulatory Assist Devices

TAGS:

- Anesthetic Management
- Anticoagulation Considerations
- Complications
- Contraindications
- Extracorporeal Membrane Oxygenation (ECMO)
- Indications
- Initiation
- Intra-Aortic Balloon Counterpulsation
- Left and Right Ventricular Assist Devices
- Percutaneous Devices
- Perioperative Evaluation (e.g., TEE Exam Findings to Guide Management)
- VA vs. VV ECMO
- Weaning

XII.F.3. Pacemakers

TAGS:

- Biventricular Pacing
- Implantable Cardioverter Defibrillators (ICD)
- Indications and Insertion
- Leadless Pacemakers
- Modes of Operation
- Perioperative Management of ICD and S-ICD
- Subcutaneous Implantable Cardioverter Defibrillators (S-ICD)

XII.G. Surgical Procedures

XII.G.1 Cardiac

TAGS:

- ASDs/VSDs
- Coronary Revascularization
- Heart Transplant
- Hypertrophic Obstructive Cardiomyopathy
- Mechanical Circulatory Support
- Minimally Invasive Valve Supply
- Neoplastic
- Pericardial
- Rhythm Disturbances
- Valve Repair and Replacement

XII.G.2 Thoracic Aortic

TAGS:

- Ascending/Arch Aortic Surgery with Circulatory Arrest
- CPB Employing Low Flow and/or Retrograde Cerebral Perfusion
- Descending Aortic Surgery
- Pharmacologic
- Spinal Cord Protection, including CSF Drainage and Management

XII.G.3. Lung Transplant

XII.G.4. Noncardiac Surgery in the Patient with Cardiac Disease – Congenital, Valvular, Coronary

TAGS:

- Mitral and Tricuspid Transcatheter Edge-to-Edge Repair
- Transcatheter Aortic Valve Replacement
- Percutaneous Left Atrial Appendage Closure

XII.H. Postoperative and Perioperative

XII.H.1. Perioperative Ventilator Management

TAGS:

- Critical Care Unit Ventilators and Techniques
- Intraoperative Anesthetics
- Postoperative Sedation Considerations
- Weaning and Discontinuation of Mechanical Ventilation

XII.H.2. Perioperative Pain Management

TAGS:

- Postoperative Pain Management

Regional Anesthesia for Cardiac Surgical Patients

XII.H.3. Postanesthetic Critical Care of Adult Cardiothoracic Surgical Patients

TAGS:

Diagnosis and Management of Postoperative Complications

Delayed Emergence/Neurologic

Hemorrhagic

Interpretation and Management of Mechanical Support of Circulation

LV, RV, or Biventricular Failure

Tamponade

Vasoplegic

XII.H.4. Point-of-Care Ultrasound (POCUS)

TAGS:

FAST Exam

Gastric

Identifying Shock (Distribution, Cardiogenic, Hypovolemic, Obstructive)

Lung

Monitoring

XII.I. Other Topics

XII.I.1. Research Methodology/Statistical Analysis

TAGS:

Fundamentals of Research Design and Conduct

Interpretation of Data

XII.I.2. Practice Management

TAGS:

Accuracy, Clarity, Specificity of Medical Records

Anesthesia Care Team and Scope of Practice

Artificial Intelligence and Machine Learning

Clinical Informatics

Coding Integrity, Audits, and Insurance Denials

Compliance with Documentation Requirements

Economics of Anesthesia Practice

Costs of Medical/Anesthesia Care

Documentation, Coding, and Billing

Efficient OR Staffing and Scheduling

Electronic Medical Record Systems: Costs and Benefits

Health Care Disparities Between Populations

Population Health: Perioperative Surgical Home and Enhanced Recovery

Population-Based Health Determinants, Resources to Improve Access

Subspecialization Issues: Pediatrics, Cardiac, Regional, Obstetric Coverage

Payment for Anesthesia Services

XII.I.3. Quality Improvement and Patient Safety

TAGS:

Anesthesia Registries

Barriers to QI

Change Management Methods

Crisis Management and Teamwork
Crisis Manuals and Other Cognitive Aids
Data Collection
Definitions
Design, Analysis, and Implementation of QI Projects
Failure Mode and Effects Analysis
Federal Quality Payment Program
Group and Facility Scorecards
Handoff Communication
Human Factors and Mindfulness
Individual Benchmarking
Information Technology to Reduce Medication Errors
Lean Six Sigma
Medical Error, Adverse Events, Sentinel Events, Misuse of Medications and Technology
Medication Errors: Assessment and Prevention
Medication Reconciliation
Patient Satisfaction Measurement
Peer Review and Morbidity and Mortality Conferences
Performance Assessment
Preoperative and Procedural Checklists
Public Reporting
QI and the 5S Process
QI Metrics
Quality Improvement (QI) Basics
Root Cause Analysis
Simulation Training
Systems Thinking and Technology Design
Teamwork Training
Value Stream Mapping
Value-Based Care Incentives, Pay-For-Performance

XII.I.4. Diversity, Equity, and Inclusion (DEI) in Health Care

TAGS:

Ageism
Approaches to Improvement; Interventions at Individual, Interpersonal, Community, Organizational and Policy Levels; Cultural and Gender Competency, Upstander vs. Bystander, Allyship vs. Performative Action, Tokenism vs Representation, Assortativity vs. Homophily
Barriers
Bias
Colorism/Shadeism
DEI in Academia
DEI in the Workplace
Discrimination Against Disability
Discrimination Against Ethnicity

- Discrimination Against Familial Status
- Discrimination Against Gender
- Discrimination Against Gender Identity
- Discrimination Against Immigration/Citizenship Status
- Discrimination Against Language
- Discrimination Against National Origin
- Discrimination Against Religion
- Implicit Bias
- Importance of Language in Reports Discussing Racial Inequities
- Leadership
- Microaggressions
- Representation of Diversity and Race-Related Topics in Research
- Scholarship
- Sexism
- Stereotype Threat
- Surgical Outcomes
- Systematic Racism

XII.I.5. Healthcare Disparities

TAGS:

- ICU Disparities and Outcomes
- Maternal Healthcare Disparities; Maternal Mortality and Morbidity, Pain Management
- Social Determinants of Health Considerations in Assessment and Management of Patients – Race, Language, Education Status, Religion, Housing, Nutrition, Geographic Location, Rural vs. Urban, Access to and Quality of Care, Health Coverage

XII.I.6. Ethics and Medico-Legal Issues

TAGS:

- Adaptations for Clinical Disability
- Advance Directives, Do Not Resuscitate (DNR) Orders, Medical Orders for Life-Sustaining Treatment
- Clinician Wellness and Self-Care
- Conflicts of Interest and Financial Disclosure
- Diagnosis and Treatment of Burnout
- Disclosure of Errors or Adverse Events
- Elements of Medical Malpractice: Duty, Breadth of Duty, Causation, Damages
- Ethical Standards in Research Design: Scientific Validity, Fair Subject Selection, Favorable Risk-Benefit Profile
- Evidence-Based Practice
- Health Care Proxy Laws and Limitations
- Informed Consent in Research
- Legal Actions and Consequences, National Practitioner Data Bank, Closed Claims Findings, Professional Liability Insurance
- Legal and Regulatory Issues
- Patient Autonomy and Decision Making

Patient Privacy Issues: Principles of Confidentiality, Access to Records, Protected Health Information

Patients Refusing Transfusion or Other Treatments

Personal Role in Reporting Unsafe Conditions and Fitness for Work

Primary Certification, Recertification, Maintenance of Certification and Related Issues (Professional Standing, Lifelong Learning, Cognitive Knowledge, Clinical Practice Assessment, Systems-Based Practice)

Principles of Informed Consent and Shared Decision Making

Principles of Justice, Autonomy, Beneficence, Nonmalfeasance

Professional Behavior: Honesty, Integrity, Compassion, Respect, Altruism, Conflicts of Interest, Response to Marketing

Professionalism: Definitions and Teaching

Recognizing and Responding to Unprofessional Behavior

Recognizing Limitations In Expertise and Need to Seek Guidance

Research Ethics

Review and Implementation of Trials, The Institutional Review Board

Sleep Deprivation

Substance Use Disorder

The Health Insurance Portability and Accountability Act (HIPAA)

Understanding Laws Related to Controlled Substances, Including Opioids and Cannabinoids