1. Basics of Spinal Disorders
   • Introduction to Spinal Surgery ▶
   • Spinal Anatomy ▶
     ◦ Introduction to Vertebral Anatomical Concepts ▶
     ◦ Anatomy and Function of Joints and Ligaments ▶
     ◦ Anatomy and Function of Muscles and Nerves ▶
     ◦ Micro and Macro Vascular Anatomy of the Spine ▶
   • Overview of Spinal Biomechanics, Stability and Balance
   • Fundamentals of Degenerative Pathology ▶
     ◦ Cervical Disk Disease ▶
     ◦ Introduction to Disc Herniation and Degenerative Disease in the Cervical Spine ▶
   • Cervical Myelopathy
   • Low Back Pain Differential Diagnosis ▶
     ◦ Introduction to Disc Herniation and Degenerative Disease in the Lumbar Spine ▶
   • Herniated Lumbar Disc with Radiculopathy
     ◦ Introduction to Disc Herniation and Degenerative Disease in the Lumbar Spine ▶
   • Lumbar Degenerative Disc Disease, Degenerative Facet Disease
   • Spinal Stenosis
   • Spondylolisthesis and Spondyloysis
     ◦ Introduction to Spondylolisthesis ▶
   • Pediatric Scoliosis
     ◦ Juvenile
     ◦ AIS
     ◦ Congenital
     ◦ Neuromuscular Conditions ▶
     ◦ Introduction to Pediatric Scoliosis ▶
   • Adult Scoliosis
     ◦ Introduction to Adult Scoliosis ▶
   • Adult Kyphosis and Flat Back Deformities
     ◦ Introduction to Adult Kyphosis ▶
   • Pediatric Kyphosis (Scheuermann’s Disease)
     ◦ Introduction to Pediatric Kyphosis ▶
   • Thoracic Herniated Disc
   • Primary Spine Tumors
     ◦ Overview of Primary and Metastatic Spinal Tumors ▶
   • Metastatic Spine Tumors
     ◦ Overview of Primary and Metastatic Spinal Tumors ▶
   • Fundamentals of Spine Trauma ▶
   • Fractures of the Cervical Spine
     ◦ Introduction to Common Fractures in the Cervical Spine ▶
   • Fractures of the Thoracolumbar Spine and Sacrum
2. Office Evaluation and Preoperative Planning
   • Overview of Clinical Evaluation and Physical Examination
   • Complete History of Spinal Illness
   • Past Medical History and Review of Systems
   • Social and Family History
   • Spine, Neurovascular and Musculoskeletal Examination
   • Decision Making: Considering Risk, Benefit and Treatment Options
      ◦ Discussion of Treatment Options with Patient
      ◦ Adequate Imaging Studies
      ◦ Introduction of Pre-Op Medical Risk Stratification and Patient Counseling
      ◦ Will Planned Surgery Accomplish the Goals of Both the Surgeon and Patient?
      ◦ Will Surgery Be Best Option for Patient?
      ◦ Are There Too Many Risk Factors?
      ◦ Is the Complexity of the Surgery Reasonable Based on Your Experience, Your Capabilities and the Capabilities of Your Hospital?
      ◦ Discuss Risks and Benefits with Your Patient!

3. Radiologic Imaging
   • Review Spinal Anatomy Section
   • Plain X-Ray (Dynamic films, etc.)
   • Fluoroscopy
   • CT Scan
   • CT Myelogram
   • MRI with and without Contrast
   • Discography
   • Bone Scan with Spect Imaging
   • PET Scan
   • Bone Density Studies
   • Indium and Gallium Scans
   • 3D Guidance and Navigation

4. Non Surgical Management
   • Doing Nothing
   • Exercise Programs
   • Physical Therapy
   • Weight Control, Nutrition
   • Traditional Chinese Medicine
   • Spinal Manipulation
   • Anti-inflammatory Medications
   • Pain Medications
• Other Drug Therapy
• Acupuncture
• Blocks
  ◦ Epidural
  ◦ Facet
  ◦ Selective Nerve Root
  ◦ Other

5. Surgical Care

Note: The details of surgical technique are taught on-site at Emory University School of Medicine and through mentoring.

• Basic Sterile Techniques
  ◦ Overview of OR Set-Up and Sterile Techniques
  ◦ Draping Techniques for Anterior Cervical, Thoracic and Lumbar
  ◦ Draping Techniques for Posterior Cervical, Thoracic and Lumbar
  ◦ Intraoperative Imaging, Plain X-Ray and Fluoroscopy
  ◦ Wound Irrigation
  ◦ Principles of Debridement and Treatment of Wound Infections

• Operating Room Introduction
  ◦ Overview of Surgical Tables and Frames
    ◦ Standard
    ◦ Quantum, Radiolucent
    ◦ Jackson Frame
    ◦ 90:90 Position
    ◦ Wilson Frame
    ◦ Gardner Wells Tongs
    ◦ Mayfield Tongs and Head Support

• Patient Positioning Techniques
  ◦ Chest, Sternal Pads
  ◦ Iliac Pads
  ◦ Abdominal Decompression
  ◦ Neck and Head Position
  ◦ Hip and Leg Position
  ◦ Arm, Shoulder Position
  ◦ Ulnar, Peroneal Nerve Protection
  ◦ Foley Catheter Placement
  ◦ Thromboembolic Device Stockings, TEDS
  ◦ Sequential Compression Device Stockings, SCDS
  ◦ Line and Tube Placement for Skin Protection
  ◦ Fracture Reduction
  ◦ Scoliosis

• Fundamentals of Anesthesia for Spine Surgery (Kreisler)
  ◦ Basic Drug Considerations for Spine Surgery
  ◦ Endotracheal Intubation
  ◦ Nasotrachial Intubation
  ◦ Tracheostomy
- Fiberoptic Intubation
- Double Lumen Endotrachial Tubes
- Arterial Lines, Oxygen Saturation Monitor
- Central Lines, Single, Double and Triple Lumen for Hyperalimentation
- Foley Catheter with Core Temperature Probe Monitor
- Hypotensive Anesthesia
- Monitoring Considerations
- Stagnara Wake Up Test
- Malignant Hyperthermia
- Cardiac Dysrhythmias
- Low Oxygen Saturation

- Intraoperative Considerations for Surgeon and Anesthesia
  - Hypotension
  - Hypothermia
  - Pneumothorax, Opposite Chest
  - Vascular Injury
  - Visceral Injury
  - Pleural and Lung Injury
  - Dural Tears
  - Root Injury
  - Cord Ischemia or Injury

- Implant Failure
- Recurrent Laryngeal Nerve
- Sacral Roots in ALIF, Retrograde Ejaculation

- Overview of Intraoperative Hemostasis and Coagulopathy (Hillyer)
  - Adequate Preparation of Blood Products
  - CBC, PT, PTT, Platelets, Fibrinogen, and other labs
  - Cell Saver
  - Autologous Blood Donation
  - Blood Bank Packed RBCs
  - Fresh Frozen Plasma
  - Platelets
  - Cryoprecipitate
  - Temperature
  - Wound Tamponade
  - Adequate Preoperative Preparation of Blood Products

- Fundamentals of Spinal Cord Monitoring (Bokros)
  - Somatosensory Evoked Potentials SSEP’s
  - Motor Evoked Potentials MEP’s
  - Electromyographic Potentials EMG’s

6. Postoperative Hospital Care
- Antibiotic Prophylaxis
- Pulmonary Care
- Physical Therapy
- Deep Venous Thrombosis Prophylaxis
• Pain Control (PCA’s Long and Short Acting Opioids)
• Drains and Wound Care
• Bowel Management
• Collars, Corsets, Braces, and Orthoses

7. Postoperative Out Patient Care
• Post Operative History
• Post Operative Examination
• Adequate Imaging of Surgery
• Reasonable Progression of Activities
• Post Operative Pain Medications
• Avoid NSAIDS in Fusions
• What to do when there is a complication or unfavorable outcome?
  • Advanced Imaging
  • Root Blocks
  • Lumbar Sympathetic Blocks
  • Goal Specific Physical Therapy
  • Pain Management
  • Revision Surgery
  • Spinal Cord Stimulators