

## **ESCOME Pre-Course Outline (v1.09)**

### 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 Spondylosis
  - Introduction to Spondylolisthesis
- Pediatric Scoliosis
  - Juvenile
  - AIS
  - Congenital and Syndromic Deformity
  - Neuromuscular Conditions
  - Introduction to Pediatric Scoliosis
- Adult Scoliosis
  - Introduction to Adult Scoliosis
  - Selection of Fusion Levels
- Adult Kyphosis and Flat Back Deformities
  - Introduction to Adult Kyphosis
  - PSO in Adult Flatback Sagittal Imbalance
- Pediatric Kyphosis (Scheuermann's Disease)
  - Introduction to Pediatric Kyphosis
- Thoracic Herniated Disc
- Spine Tumors
  - Overview of Primary Spinal Tumors
  - Overview of Metastatic Spinal Tumors
  - Spinal Tumors: Primary and Metastatic Disease
- Fundamentals of Spine Trauma
- Fractures of the Cervical Spine
  - Introduction to Common Fractures in the Cervical Spine

- Fractures of the Thoracolumbar Spine and Sacrum
    - Introduction to Common Fractures in the Thoracolumbar Spine and Sacrum
  - Infection
    - Introduction to Infections in the Spine Including Post-Operative Infections
  - Osteoporosis and Metabolic Bone Disease
  - Inflammatory Spondyloarthropathy
  - Principals of Bone Grafting and Fusion
  - Specific Surgical Techniques
2. Office Evaluation and Preoperative Planning
- Overview of Clinical Evaluation and Physical Examination
  - 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  
Bean Bags
  - 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
- Nasotracheal Intubation
- Tracheostomy
- Fiberoptic Intubation
- Double Lumen Endotracheal 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
- Intraoperative 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

#### 8. Essentials of Post Op Complication

- Infection
- Nonunion
- Implant Failure
- Deep Venous Thrombosis
- Radiculopathy