



Curriculum for Division of Neurosurgery Grand Rounds

2 Lectures each week (144 Topics)

1) Special Topics in Neurosurgery

- Approach to coma / Brain death
- Neuro-ophthalmology
- Neurourology
- PET/SPECT/FMRI
- Radiosurgery: basic principles and applications in the brain and spine
- Special anesthetic considerations in neurosurgery including venous air embolism
- Complication avoidance in neurosurgery
- Intraoperative electrophysiological monitoring (EMG, EEG, SSEP, MEP, BSAER): indications and physiologic basis
- Ethics in Neurosurgery
- Medico-legal issues in neurosurgery

2) Tumors (Pediatric and Adult)

Introduction

- Overview of histopathologic classification
- Molecular biology of brain tumors/ Hereditary tumor syndromes
- Pseudotumor cerebri and other non-neoplastic disorders mimicking brain tumors

Intrinsic tumors

- Low grade gliomas
- Malignant gliomas
- Pineal region tumors including germ cell tumors
- Medulloblastoma
- Ependymoma
- CNS lymphoma (primary and secondary)
- Optic pathway gliomas
- Metastatic brain tumors and neoplastic meningitis

Extrinsic and skull base tumors

- Meningioma and hemangiopericytoma
- Acoustic neuroma
- Pituitary tumors
- Craniopharyngioma
- Epidermoid, dermoid and inclusion cysts
- Chordoma and chondrosarcoma
- Glomus jugulare tumors + Tumors of the orbit



- Esthesioneuroblastoma and neoplasms of the paranasal sinuses
- Skull base approaches: Orbitozygomatic, Petroclival region, clivus, Craniovertebral junction

3) Vascular (Pediatric and Adult)

- Carotid artery stenosis
- Vertebral and carotid dissection / Cerebral venous thrombosis
- Intracranial occlusion disease and Moyamoya + Mycotic aneurysm
- Spontaneous ICH (non-aneurysmal / non-AVM)
- Unruptured intracranial aneurysms
- Perioperative management of SAH / Vasospasm
- Anterior circulation aneurysms
- Posterior circulation aneurysms
- True AVMs of the brain
- Dural AVMs
- Cavernous malformations
- Carotid-cavernous fistulae
- Spinal AVMs
- Endovascular Therapy

4) Functional (Pediatric and Adult)

- Epilepsy I: classification, diagnosis, indications for surgery
- Epilepsy II: temporal lobe
- Epilepsy III: extratemporal surgery / outcomes of surgery
- Movement disorder surgery: Neurophysiological basis, patient selection and outcome
- Spasticity: Pathophysiology, indications for surgery and surgical techniques
- Physiologic anatomy of pain
- Approach to the patient with chronic pain including non-operative management
- Surgery for chronic pain
- Trigeminal neuralgia

5) Pediatrics

- Overview of disorders of brain/spine embryogenesis
- Encephaloceles
- Myelomeningocele and myelocystocele and lipomyelomeningocele
- Tethered spinal cord and occult spinal dysraphism
- Dandy-Walker syndrome and arachnoid cysts
- Craniosynostosis + Craniofacial syndromes
- Chiari malformations
- Physiology of CSF shunts
- Hydrocephalus in children and avoidance of complications
- Neuroendoscopy + vein of Galen Malformation



6) Peripheral Nerve

- Brachial plexus anatomy + injuries
- Upper extremity peripheral nerve anatomy I (axillary n, musculocutaneous n, radial n)
- Upper extremity peripheral nerve anatomy II (ulnar n, median n)
- Carpal tunnel syndrome and ulnar neuropathy at the elbow
- Other entrapment syndromes of upper extremity peripheral nerves
- Lumbosacral plexus + Lower extremity peripheral nerves: anatomy and entrapment syndromes
- Electrodiagnostic evaluation of peripheral nerves
- Management of acute peripheral nerve injuries
- Management of peripheral nerve tumors
- Peripheral neuropathies

7) Spine

- Gross spinal anatomy + Biomechanics
- Physiology of bone healing and technical aspects of bone grafting/harvesting
- Approach to the patient with lower back pain
- Failed back syndrome + Chronic pain management
- Congenital and acquired (non-traumatic) abnormalities of the craniovertebral junction + Benign extradural lesions of the dorsal spine
- Rheumatoid Arthritis
- Cervical disc disease
- Cervical spondylotic myelopathy
- Spondyloarthropathies including ankylosing spondylitis
- Ossification of the posterior longitudinal ligament and other enthesopathies
- Lumbar disc disease
- Lumbar stenosis
- Spondylolysis and spondylolisthesis
- Degenerative scoliosis

Spine Tumors

- Spinal cord tumors in adults and children
- Intradural extramedullary tumors and tumors of the filum terminale
- Primary tumors of the vertebral axis
- Metastatic spinal tumors
- Differential diagnosis and approach to tumors of the sacrum/coccyx



8) Trauma

Spine Trauma

- Spinal cord injury in adults and children: approach to the patient and diagnosis
- Occipitocervical dislocation and atlas injuries / Rotatory atlanto-axial subluxation
- Odontoid fractures + Hangman's fractures
- Subaxial cervical and cervicothoracic injuries
- Thoracolumbar fractures

Head Trauma

- Pathophysiology of brain injury
- Initial resuscitation and evaluation of brain injured patients / Critical care management + AANS guidelines
- Penetrating injury to the brain
- Traumatic CSF fistulae
- Traumatic cranial nerve injuries
- Concussion
- Closed head injury

9) Infection

- Brain abscess
- Infectious complications of neurosurgical procedures
- Infections of spine
- Tuberculosis: brain and spinal manifestations
- CNS complications of HIV

10) Pathology

- Basic Histology
- Tumors
- Non-Tumor (Infection, Demyelination, Inflammation)
- Vascular
- Neurodegenerative

11) Neuroradiology

- Principles of CT
- Principles of MRI
- Cerebral Angiography 1
- Cerebral Angiography 2
- PET/ SPECT/ FMRI