

Rotation Specific Goals & Objectives for Neurosurgical Rotations

Junior Residents (PGY 3-4)

General

- Implementation and supervision to implement CanMEDS roles and competencies as published by the Royal College (see CanMEDS Goals and Objectives)
- Acquire precise knowledge of the anatomy of the central and peripheral nervous system including spine and skull, and a working knowledge of the other basic neuroscientific disciplines including physiology, pathology, embryology, endocrinology and neuropsychology
- A thorough understanding of the general field of neurology, with particular emphasis on those neurological entities, which have important differential diagnostic consideration with respect to neurosurgery. This will be reinforced during three-month neurology rotation
- Learn proper examination, documentation, presentation and decision making to provide concise and precise assessment of patients and plan for patient treatment
- Gain exposure to ambulatory care neurosurgery under the supervision of attending staff two half day per week
- Learn to manage critically ill patients in the Emergency Department, neurosurgery unit and ICU
- Be able to communicate effectively in consultation
- Manage post-operative patients and complications
- Become familiar with appropriate investigations and their role (including CT, myelogram, MRI, angiogram, nerve electrophysiological studies, nuclear medicine tests), and become able to interpret results of these studies
- Learn the experience of case or topic presentations at Neurosurgery, Cerebrovascular, Neuroscience or Spine rounds.
- Learn to function as a team member with the supervision of senior residents
- Learn to participate in teaching activities to other peer residents, medical students, nurses or other allied health professionals. Also develop and implement personal continuing education strategies
- Learn to appraise the literature critically and apply this knowledge appropriately into individual patient management
- Be involved in at least one clinical or basic science research project at any point during residency with the aim to present in major meetings or in publications
- Be able to effectively collaborate with other physicians and health care professional in providing patient care and also contribute to other interdisciplinary team activities in a graded fashion
- Learn to manage the time and resources effectively in order to balance patient care and outside activities and personal life
- Practice neurosurgery in an ethically responsible manner that respects the medical, legal and professional obligations of belonging to a self-regulating body



Neuro-oncology

- Obtain operative experience as first assistance and graded responsibility for surgery on all spectrums of brain tumors
- Involvement in surgical management of variety of brain tumors
- Exposure to special technique in skull base surgery
- Learn to perform simple craniotomy for different tumor locations

Cerebrovascular Surgery

- Obtain operative experience as first assistance and graded responsibility for surgery on the full spectrum of cerebrovascular disease
- Exposure to medical and surgical treatment of aneurysm (and subarachnoid hemorrhage), AVM and carotid endarterectomy
- Understand the general principles of endovascular neurosurgery and its applications

Trauma

- Learn the clinical and surgical management of the trauma patient in a trauma center
- Learn to perform simple trauma craniotomy for intracranial hematoma and skull fracture
- Able to perform burr hole for drainage or insertion of ICP monitor

Spine & Peripheral Nerve

- Learn to apply the Halo orthosis and continue the surgical and non-surgical management of spine fractures
- Expose the dorsal cervical, thoracic, and lumbar spine
- Expose the anterior cervical spine
- Carpal tunnel exposure/release under direct supervision
- Ulnar nerve exposure/decompression at elbow under direct supervision

Functional

- Awareness of technique and understanding of relevant surgical anatomy and recognize the principles of management in:
 - o Pain management including dorsal column stimulation and morphine pump
 - o Management of spasticity
 - o Awake craniotomy and functional cortical localization
 - o Epilepsy surgery
 - o Stereotactic surgery including frameless and rigid frame modalities for localization/biopsy/movement disorder surgery



Pediatrics

- Ability to examine infants and children
- Becoming familiar with neurosurgical diseases commonly affect children including hydrocephalus, spinal dysraphic disorders, craniosynostosis, tumors more unique to children
- Learn in detail to diagnose and manage hydrocephalus and its surgical treatments and complications. Being able to insert a ventriculoperitoneal shunt in a child

Senior Residents (PGY 5-6)

General

- Learn lead and educate the more junior residents and students
- Assume primary responsibility for decision-making and care of patients under his/her care
- Achieve experience in organization and presentation in Neuroscience Rounds, Neurosurgery Rounds and occasionally Spine Rounds
- Prepare Mortality and Morbidity Rounds monthly and prospectively collect the data
- Obtaining increasing responsibility in neurosurgical procedures (primary or first assistance based on complexity of cases and competency of resident)
- For all procedures the resident should progressively become more independent during the final two years of their residency

Neuro-oncology

- Learn the craniotomy for meningioma
- Learn the craniotomy for various glial tumors
- Learn the various skull base approaches, exposure and removal of tumors (e.g. vestibular schwannoma, meningioma)
- Participate in trans-sphenoidal approach to pituitary tumors
- Learn the indication and approach for awake craniotomy

Cerebrovascular Surgery

- Achieve competency in exposure and performing carotid endarterectomy
- Exposure to various intracranial aneurysms and being able to clip the common anterior circulation aneurysms
- Craniotomy and excision for simple AVMs
- Learn the basic components of cerebral angiography and understand all indications for treatment using endovascular neurosurgery techniques



Trauma

- Extensive experience in ICU and operative management of all traumatic brain injuries independently
- Extensive experience in ICU and operative management of all traumatic spinal injuries including various anterior and posterior spinal instrumentation or application of external orthosis

Spine & Peripheral Nerve

- Exposure and removal of lumbar and cervical disc independently (both posterior and anterior approach)
- Able to perform Cervical laminectomy and fusion with or without instrumentation independently
- Learn to diagnose and manage spinal infections or tumors (including operative approaches)
- Acquire capacity to expose and remove various spinal cord tumors
- Microsurgical repair of peripheral nerve
- Exposure to medical and surgical management of complex peripheral nerve surgery such as brachial plexus lesions

Functional

- More exposure and direct participation in surgical management of pain, epilepsy, spasticity and stereotactic localization for movement disorders
- Able to perform framed or frameless stereotactic localization or biopsy independently

Pediatrics

- Exposure and participation in closure of myelomeningocele, treatment of lipomyelomeningocele and tethered cord syndrome
- Exposure and participation in surgical treatment of craniosynostosis
- Skills to diagnose and treat various forms of hydrocephalus and becoming comfortable with surgical treatment of shunt malfunction
- Becoming familiar with use of neuroendoscope, third ventriculostomy