

## Rotation Specific Objectives for Neurosurgery: CanMEDS

### **1. Medical Expert/Clinical Decision-Maker**

Demonstrate diagnostic and therapeutic skills for ethical and effective patient care; Access and apply relevant information and therapeutic options to clinical practice; demonstrate effective consultation services with respect to patient care, education and legal options; recognize personal limits of expertise. Knowledge requirements:

#### Knowledge: Basic Science & Anatomy

- A) Basic neuroanatomy, neurophysiology, and neuropathology sufficient to understand clinical presentation, and management of neurosurgical conditions
- B) Pharmacology including principles of metabolism, action and toxicity of drugs commonly used in neurosurgery

#### Knowledge: Clinical

- A) Medical history: concise, accurate and appropriate
- B) Physical examination: relevant, sufficiently elaborate, and appropriate
- C) An understanding of the general field of neurology, with particular emphasis on those neurological entities, which have important differential diagnostic consideration with respect to neurosurgery
- D) Diagnostic tests: order appropriate tests in a cost-effective, ethical and useful manner
- E) Medical imaging tests: interpretation of basic x-ray, EMG / NCS, CT, MRI and radionuclide studies
- F) Clinical diagnosis and decision-making: formulate diagnosis and therapeutic strategy for neurosurgical problems
- G) Documentation / presentation: well-documented and organized assessments and recommendations
- H) Preoperative planning: understand the concept; order appropriate preoperative investigations to assist in planning and execution of preoperative plan
- I) Postoperative care: provide appropriate care to include effective pain management (with multidisciplinary assistance, if necessary), both in the hospital and office environments; recognize promptly and manage postoperative complications in an effective manner
- J) Emergency management — recognition: able to identify and respond appropriately to urgent medical and surgical problems
- K) Evidence-based practice: aware of the role of evidence in clinical decision-making. Able to access, retrieve and apply relevant information



## Knowledge: Technical

### **Surgical Foundations (PGY 1-2) Requirements:**

- A) Trauma: acute management of brain and spine injured patients (ER, patient selection for OR, ICU care, postoperative care)
- B) Use of monitoring devices and tubes used in neurosurgery (ICP monitor, external ventricular drain, lumbar drain, halo vest, cervical traction)
- C) Immobilization of the spine and closed treatment of cervical spine injuries (application of halo vest, cervical traction)
- D) Use of surgical equipment: understand its use, recognize its limits and apply its use safely, simultaneously taking measures to protect both oneself and other associates from blood and airborne debris
- E) Use of imaging equipment: understand its use, recognize the role of, and appreciate safety measures required to protect patients, self and other personnel from ionizing radiation

### **PGY 3-4 Requirements:**

- A) 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 techniques in skull base surgery
  - Learn to perform simple craniotomy for different tumor locations
- B) Cerebrovascular
  - 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), and carotid endarterectomy
- C) Trauma
  - Learn the clinical and surgical management of the trauma patient in a busy 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
- D) Spine & Peripheral nerve
  - 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



## Knowledge: Technical

### E) Functional

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

### F) 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 in children

## **PGY 5-6 Requirements:**

### A) Neuro-oncology

- Perform craniotomy for meningioma
- Perform craniotomy for various glial tumor
- Demonstrate familiarity with the various skull base approaches, exposure and removal of tumors (e.g. vestibular schwannoma)
- Perform the transphenoidal approach to pituitary tumors
- Perform awake craniotomy with cortical localization

### B) Cerebrovascular

- Perform carotid endarterectomy
- Perform exposure and clipping for common intracranial aneurysms
- Perform craniotomy and excision of simple AVMs

### C) Trauma

- Demonstrate skillful ICU management of neurosurgical issues
- Independent operative management of traumatic brain injuries
- Demonstrate proficiency in the surgical decompression and stabilization of cervical, thoracic and lumbar spine injuries (both anterior and posterior approaches)



## D) Spine & Peripheral Nerve

- Perform exposure and removal of lumbar and cervical disc independently
- Perform decompression and fusion with or without instrumentation independently.
- Demonstrate proficiency in the diagnosis and management of spinal infections or tumors (including operative approaches)
- Acquire capacity to expose and remove various spinal cord tumors
- Demonstrate proficiency in the microsurgical repair of peripheral nerve injuries
- Exposure to medical and surgical management of complex peripheral nerve surgery such as brachial plexus lesions

## E) 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

## F) Pediatrics

- Exposure and participation in closure of myelomeningocele, treatment of lipomyelomeningocele and tethered cord syndrome
- Exposure and participation in surgical treatment of craniosynostosis.
- Demonstrate proficiency in the diagnosis and treatment of various forms of hydrocephalus and becoming comfortable with surgical treatment of shunt malfunction
- Exposure and participation with use of neuroendoscope, third ventriculostomy

## 2. Communicator

### Requirements:

- A) Recognize that being a good communicator is an essential function of a physician, and understand that effective patient-physician communication can foster patient satisfaction and compliance as well as influence the manifestations and outcome of a patient's illness and surgical intervention
- B) Establish relationships with the patient that are characterized by understanding, trust, respect, empathy and confidentiality
- C) Recognize the emotional stress for patients and families faced with neurosurgical conditions, a stress accentuated in the treatment of children
- D) Gather information not only about the disease but also about the patient's beliefs, concerns and expectations while considering the influence of factors such as the age, gender, ethnic, cultural, spiritual and socio-economic background
- E) Deliver information to the patient and family in a humane manner and in such a way that it is understandable; encourage discussion and promote patient's participation in decision-making
- F) As a prelude to surgical intervention use above skills to obtain informed consent; appreciate alternative means of achieving consent if the patient is incompetent to provide consent
- G) Understand and demonstrate the importance of cooperation and communication among health professionals involved in the care of individual
- H) Maintain clear, accurate and appropriate written records

- I) Complete concise hospital discharge summaries promptly
- J) Write well-organized letters, providing clear direction to the referring physician and other physician and allied personnel

### **3. Collaborator**

#### **Requirements:**

- A) Describe the role, expertise and limitations of all members of an interdisciplinary team required to optimally achieve a goal related to patient care, a research problem, an educational task, or an administrative ability
- B) Develop a care plan for a mutual-interest patient, that includes investigation, treatment and continuing care in both hospital and community settings
- C) Participate in an interdisciplinary team, demonstrating the ability to accept, consider and respect the opinions of other team members, while contributing specialty-specific expertise

### **4. Manager**

#### **Requirements:**

- A) Utilize resources effectively to balance patient care, learning needs, and outside activities
- B) Allocate finite health care resources wisely
- C) Work effectively and efficiently in a health care organization
- D) Utilize information technology to optimize patient care, life-long learning and other activities

### **5. Health Advocate**

#### **Requirements:**

- A) Demonstrate knowledge of determinants of health by identifying the important determinants of health (i.e., poverty, unemployment, early childhood education, social support systems)
- B) Demonstrate knowledge of these concepts as applied:
  - In the management of individual patients, by identifying the patient's status with respect to one or more of the determinants of health; adapting the assessment and management accordingly; and assessing the patient's ability to access various services in the health and social system
  - In relation to the general population by describing the key issues currently under debate regarding changes in the Canadian health care system indicating how these changes might affect societal health outcomes particularly when relevant to neurosurgery

### **6. Scholar**

#### **Requirements:**

- A) Develop, implement and monitor a personal continuing education strategy
- B) Critically appraise sources of medical information
- C) Facilitate learning of patients, house staff/students and other health professionals

## **7. Professional**

### **Requirements:**

- A) Deliver highest quality care with integrity, honesty and compassion
- B) Exhibit appropriate personal and interpersonal professional behaviors
- C) Practice medicine ethically consistent with obligations of a physician
- D) Use appropriate strategies to maintain and advance professional competence
- E) Continually evaluate his/her abilities, knowledge and skills and know his/her limitations of professional competence