Neuro Anesthesiology Fellowship
Goals & Objectives

The Neuro Anesthesiology Fellowship is a 1-year training program at McMaster University. The three primary objectives of the fellowship are to develop competence in:

(1) The provision of anesthetic care for complex neurosurgical procedures
(2) Pre and post-surgical care of neuro surgical patients
(3) Management of patients in the Neuro DI suite

CanMEDS Objectives:

Medical Expert

Provision of anesthetic care for complex neurosurgical procedures

- Understand the various neuro surgical procedures, their indications, potential complications and anesthetic considerations
- Understand the differences between neuro surgical procedures in the operating room vs the neuro interventional suite
- Understand the patient safety considerations with out of OR procedures
- Obtain a deeper understanding of venous air embolism risk with prone and posterior fossa surgeries and learn how to apply various monitors (including the precordial doppler for venous air embolism detection)
- Develop a subspecialty knowledge in awake craniotomies including the anesthetic considerations, potential risks and complications of the various anesthetic techniques
- Learn how to properly do a scalp block for post op analgesia as well as regional anesthesia for awake craniotomies
- Understand the various neuromonitoring techniques including motor evoked potentials
- (MEPs), somatosensory evoked potentials (SSEPs), brainstem evoked potentials (BEPs) and visual evoked potentials (VEPs) and their interactions with the anesthetic technique
- Understand BIS and Entropy monitoring and their subspecialty uses in Neuro anesthesia
- Understand the basic principles of total intravenous anesthesia (TIVA) and how in applies to both neuro monitoring and brain protection
- Understand signs and symptoms as well as imaging findings of increased ICP and techniques to lower ICP acutely and chronically
- Understand basic imaging finding on neuro CT and MRI to understand the potential complications of the surgery and promote techniques to reduce risk
- Develop a technique for emergence specific to the neuro patient that reduces coughing, bucking and movement

Neuro Step down Unit

- Understand the entire operative experience for the patient
- Come to a better appreciation of post operative complications and how the anesthetic management of a patient may contribute

Pediatric Neuro Anesthesia

- Understand the specific anesthetic considerations of the pediatric patient coming for a neurosurgical procedure
- Learn the dosing of neuro anesthetic drugs specific to the pediatric patient
- Understand the different techniques for induction and their role in ICP management

Communicator

- discuss anesthetic plans and concerns to patients and their families in a manner that promotes understanding of their care and participation in decision making
- discuss concerns regarding the perioperative care of the patients with the surgical and nursing teams at the beginning of each care as well as during the case as the need arises
- maintain clear, accurate and appropriate records of procedures and anesthetic care
- present verbal handover of the patients care to the recovery room, ICU or step down teams in a way that allows everyone to understand the patients operative course

Collaborator

- work effectively with our surgical, neuro interventionalists and nursing colleagues throughout the entire perioperative period lead education sessions with peers, residents and colleagues

Leader

- lead education sessions with peers and colleagues

Health Advocate

- identify determinants of health in patients requiring complex neurosurgical procedures and ensure appropriate preoperative assessments have been done to ensure the best possible care of the patient
- Ensuring appropriate preoperative testing and imaging have been done prior to the procedure

Scholar

- access, use and review the neuro anesthesia literature to answer learning questions
- complete at least one clinical research project over the course of the year. Research
- projects include quality improvement initiatives, systematic reviews, RCTS, cohort/ case
- control studies, chart reviews, writing of a book chapter/review article
- present to colleagues at quality improvement rounds once during the academic year

Professional

- demonstrate a commitment to delivering the highest quality care to neurosurgical patients
- interact with healthcare team members professionally to promote a culture of safety and teamwork
- demonstrate recognition of personal limitations of professional competence relating to the anesthetic care of the neurosurgical patient and demonstrate a willingness to call upon others with special expertise

Description of Training

The Neuro anesthesiology fellowship is a competency-based program following core training in anesthesiology. Training will be conducted at McMaster affiliated hospitals including Hamilton General Hospital, Juravinski Hospital and McMaster University. The fellow will participate in all aspects of neuro anesthesiology including pre and post-surgical care by working in the neuro step down unit, pediatric anesthesiology and neuro interventions in the neuro diagnostic imaging suite.

The special competency will be achieved by the following:

1. Participation in Neurosurgical cases 2-3 times a week
2. Participation in the anesthetic care of patients undergoing neuro interventional procedures in the diagnostic imaging suite 1 time every second week (every Thursday). This will include exposure to all but not limited to: AVM embolization, Aneurysm coiling, mechanical thrombectomy, carotid stenting
3. The fellow will complete one month of dedicated pediatric neuro anesthesia. During this month the fellow will participate in a wide variety of neurosurgical cases at McMaster children's hospital.
4. The fellow will develop expertise in the area of anesthesia for awake craniotomies and will participate in at least 2 awake craniotomies per month
5. Participate neuro trauma cases both during the day and through their on-call experience
6. The fellow will develop a competency in the provision of anesthetic care for Major spine surgery including but not limited to complex intradural and extradural spinal tumor resections, spinal decompressions and fusions)
7. The fellow will complete one to two months in the Neuro step down unit. During this time the fellow will gain experience in the perioperative care of the neurosurgical patient. The fellow will have the opportunity to work with both neuro anesthesiologists and neuro intensivists during this time.
8. Performance of at least one clinical research project over the course of the year in a neuro anesthesia topic. Research projects include quality improvement initiatives, systematic reviews, RCTS, cohort/ case control studies, chart reviews, writing of a book chapter/review article.
9. The fellow will participate in formal resident teaching 2x over the academic year and will be involved with informal teaching in the operating room on a regular basis.
10. The fellow will present a neuro anesthesia topic to their colleagues for quality improvement rounds 1x during the academic year.

Weekly assignment schedule split (unevenly) into the below. This is subject to change at the discretion of the Fellowship Director.

- Subspeciality days [2 – 3 days] in specialty anesthesia. Fellows are assigned one-to-one with specialty anesthesia staff.
- Service days [2 days] in the operating room performing adult anesthesia lists. Fellows are assigned to an OR list and operate independently while being covered by anesthesia staff operating in another adjacent OR
- Non-clinical days (NCDs) or academic days [1 day]: This is granted according to the fellow's academic engagement (research, teaching, journal clubs etc.)

On-call duty – on average:

- 2 weekdays and 1 weekend per month
- Fellows are assigned on-call at the Juravinski hospital from 5:00 pm- 8:00 am
- Fellows are assigned with anesthesia staff working in the OR
- The next day is post-call