**FELLOWSHIP in CEREBROVASCULAR SURGERY**

**Type of Fellowship:** Clinical fellowship in cerebrovascular neurosurgery

**Supervisors & Teaching Faculty:** Dr David Sinclair, Dr Denis Sirhan and Dr Benjamin Lo

**Fellowship information:**
Number of fellowship positions available: 1 per year
Name of hospitals involved in training: Montreal Neurological Hospital and Institute

**Duration of fellowship:** 1 year

**Description of fellowship:**
This neurovascular fellowship is set up to provide the necessary microsurgical training to achieve subspecialty expertise in the diagnosis, treatment, and management of patients presenting to the Montreal Neurological Institute with different vascular-themed intracranial, intraspinal, and skull base neurosurgical disorders. The fellowship’s clinical care component will be coupled with participation in and development of clinical research studies in patients with various neurovascular and skull base diseases.

The cerebrovascular neurosurgical fellow will spend a minimum of 75 to 80 % of his/her time on clinically-related patient matters (surgical rounds, clinics and operations). The fellow will be encouraged to interact with, and to initiate collaborative research involving the McConnell Brain Imaging Centre (BIC), the Departments of Neuroradiology, Neuroanesthesia, Neuropathology, Otolaryngology and the Neuro-Intensive Care Unit (NICU). The fellow will also be actively involved in competency-based neurosurgery resident training along with medical student teaching (journal club and academic rounds) and will be expected to further develop and lead the teaching of the Division of Neurosurgery microsurgical training facility to help augment neurosurgery resident microscopic operative skills acquisition.

**Research activities and publications related to fellowship:**

Please see the supervisors’ CVs appended.
Mission statement for fellowship:

The fellowship will provide, for those individuals aiming to pursue an academic / clinical career in intracranial, intraspinal, and skull base neurovascular surgery, the needed clinical and surgical expertise in treating the spectrum of these challenging cerebrovascular and skull base disorders.

Source of funding for fellowship: Numerous internal and external Canadian funding sources are available to the applicant including the Canadian Heart and Stroke Foundation, FRSQ and the CIHR. International candidates may derive funds from external institutions and governments. Quebec residents may apply for PGY 6 funding through the RAMQ.

Faculty roles:

The fellow will be expected to interact on a regular basis with all the faculty in the Department of Neurosurgery and in particular with the teaching faculty of the cerebrovascular and skull base surgical service. This will offer the fellow the broadest exposure to the different areas of staff expertise, both in the clinical care of neurosurgical patients and in clinical research.

Summary of clinical practice:

The cerebrovascular and skull base neurosurgical program is based primarily at the Montreal Neurological Hospital and in collaboration with the Department of Neuroradiology annually treats between 200 and 300 stroke patients and 50-100 patients with surgical skull base pathologies. Three or 4 operative days per week are devoted to cerebrovascular and skull base surgery. The cerebrovascular service is the busiest emergency surgical service at the MNI. The cerebrovascular service follows, studies and treats a large outpatient clinical cohort encompassing the spectrum of cerebrovascular neurosurgical disorders. The cerebrovascular neurosurgical fellow will be exposed to the full gamut of cerebrovascular pathologies including those surgical disorders requiring skull base microsurgical approaches.
The cerebrovascular neurosurgical service is a dynamic clinical service which works closely with the stroke and neurology cerebrovascular programs. As such we discuss on a daily basis clinical treatment plans with our nurse clinician and the stroke team. The fellow’s participation in this continued dialogue will be encouraged.

**Academic facilities:**

The Montreal Neurological Hospital cerebrovascular and skull base neurosurgical service, the neurosurgical intensive care unit, the clinical research unit (CRU), the McConnell Brain Imaging Centre, and MNI affiliated basic research laboratories studying cerebrovascular disease offers to the fellow a full complement of academic and research support.

**Information and materials relevant to fellowship training:**

The Montreal Neurological Institute has extensive library resources with both in-house textbooks and journals, supported by on-line digital access available through the McGill University Library network.

**Fellow’s duties and responsibilities:**

The fellow will round on the patients in an advisory and teaching capacity on the cerebrovascular and skull base service daily with the residents. Debate on the course of clinical care amongst the service team members will mandate staff consultation towards finding a resolution.

The fellow will be involved on a day to day basis with teaching residents through both informal bedside and clinical rounds supplemented by further instruction in the operating room or through formal teaching during the academic half day program.

The fellow will also be responsible for participating in weekly clinics under the supervision of the responsible staff and to develop a research project which should result in a number of papers by the year’s end.

There are a number of weekly and monthly interdisciplinary rounds with other interested vascular services in which the fellow will be expected to attend and contribute.
The fellow is expected to take general neurosurgery “call” to a maximum of 9 calls per month as per the “Collective Agreement guidelines established with provincial resident unions. Although the majority of time will be spent at the Montreal Neurological Hospital, the fellow will be encouraged to attend, where possible, interesting cerebrovascular cases that arise at the Montreal Children’s Hospital and the Montreal General Hospital. Rounds attendance when applicable and presentations at these institutions will also be encouraged. Along with formal teaching seminars during academic half day activities the fellow will also be responsible for presenting morbidity and mortality rounds of behalf of the cerebrovascular and skull base service as required.

**Curriculum:**

The fellow will be expected to spend the majority of his / her time in both clinical endeavors and the OR setting. This should still leave enough time however for academic pursuits. Different assigned readings, from staff (reflecting their areas of expertise), and organizing monthly journal clubs along with academic half day seminars will constitute just some of the learning exercises expected of the fellow. Attendance at cerebrovascular meetings offered in both the departments of Neurosurgery and Neuroradiology along with paper presentation at national and international conferences will be expected.

**Evaluation:**

The fellow will receive an evaluation every 3 months by the fellowship director, after receiving input from the attending staff, and who will then submit this evaluation to the residency program director and the residency committee for review. The fellow will have the opportunity to offer formal feedback to the fellowship director and staff every 3 months. Any fellowship concerns will be promptly addressed by the residency program director.
This fellowship program is recognized by the Department of Postgraduate Medical Education of McGill University but is not recognized by the Royal College of Physicians and Surgeons of Canada. Cerebrovascular surgery is a recognized subspecialty within the teaching of neurosurgery at the national level and subspecialty recognition will eventually be sought from the Royal College but this is not the case at this time.

This fellowship training will add critical experience and exposure to managing complex cerebrovascular neurosurgical diseases along with obtaining important academic experience in clinical trial research participation and teaching.
Specific objectives for Fellow in CEREBROVASCULAR

KNOWLEDGE
The neurovascular fellow must demonstrate the following knowledge as a basis for his/her clinical competence. The fellow must be familiar with and able to act at the level of a consultant neurosurgeon in the management of in-patient and out-patient cerebrovascular disease

CLINICAL SKILLS
1. Obtaining a detailed history and performing a detailed neurological and vascular examination
2. Consultant level management and care of NICU, in-patient and out-patient vascular and skull-base-related vascular disease
3. Organize teaching rounds for other residents
4. Organize journal clubs on vascular pathologies

TECHNICAL SKILLS
At the completion of training, the neurovascular fellow must have demonstrated a thorough understanding of the surgical anatomy, and the technical ability to satisfactorily and safely perform neurosurgery in patients of all ages
1. Neck dissection for carotid exposure/carotid endarterectomy
2. Craniotomy for aneurysm and AVM to expose pathology
3. Positioning for complex skull-base vascular problems
4. Shunting procedures
5. Dissection of arachnoid cisterns, defining the aneurysm neck and clipping of aneurysm
6. Microsurgical exposure of suprasellar and cerebellopontine angle cisterns
7. Surgical approaches to AVMs (arteriovenous malformations)
8. Microvascular decompression
9. Performing microsurgical anastamotic techniques
**COMMUNICATOR**

General Requirements
1. Establish therapeutic relationships with patients/families
2. Obtain and synthesize relevant history from patients/families/communities
3. Listen effectively
4. Discuss appropriate information with patients/families and the health care team

Specific Requirements
The neurosurgical fellow will:
1. Document appropriate histories, physical examinations, and progress notes.
2. Establish communication with the patient and family that supports a trusting and open relationship.
3. Provide information to the patient and family that supports the patient's participation in decision-making.
4. Respond appropriately to patients, families, and colleagues, who express anger, hostility, or a complaint.
5. Share information with other healthcare providers that supports teamwork and effective care planning and provision in an expeditious manner.
6. Be sensitive to the needs of patients and their families as they are affected by gender, cultural and ethnic perspectives.
7. Be able to communicate in a clear, concise and collegial manner with referring physicians.
8. Be able to present data to a group of peers or allied health personnel in a clear and understandable way.
9. Learn the avenues of communication with institutional managers and administrators to be able to clearly express the needs of his/her service.

**COLLABORATOR**

General Requirements
1. Consult effectively with other physicians and health care professionals.
2. Contribute effectively to other interdisciplinary team activities.

Specific Requirements
1. Communicate with other physicians and health care professionals to contribute effectively to interdisciplinary team activities to improve patient care in the management of cerebrovascular disorders that benefit from such approaches.
2. Be able to collaborate with allied health care personnel in developing public education tools.
3. Be able to work with healthcare governance at all levels.
4. Contribute administrative skills to the physician team, including direction.
5. Be able to delegate responsibilities where and when appropriate.
6. Listen to concerns expressed by others providing care and assist in resolving these concerns if appropriate.

MANAGER
General Requirements
1. Utilize resources effectively to balance patient care, learning needs, and outside activities.
2. Allocate finite health care resources wisely.
3. Work effectively and efficiently in a health care organization.
4. Utilize information technology (e.g. searching medical databases) to optimize patient care, life-long learning and other activities.

Specific Requirements
The neurosurgical fellow must:
1. Apply appropriately time management for clinical activity, learning needs and family and recreational activities.
2. Function efficiently and effectively within a health care organization so as to optimize the application of existing resources.
3. Interact with the larger community to preserve and secure adequate resources for the provision of excellent care.

HEALTH ADVOCATE
General Requirements
1. Identify the important determinants of health affecting patients with cerebrovascular pathologies
2. Contribute effectively to improved health of patients and communities.
3. Recognize and respond to those issues where advocacy is appropriate.

Specific Requirements
Considering the disabling nature of many vascular conditions affecting the brain and spine, neurosurgical fellow must learn to:
1. Identify the important determinants of health that affect their patients.
2. Contribute effectively to injury prevention, health maintenance and health enhancement programs in the community.
3. Be effective advocates of practices that enhance health and well-being.

SCHOLAR
General Requirements
1. Develop, implement and monitor a personal continuing education strategy.
FELLOWSHIP OBJECTIVES
McGill Specialty Training Requirements in Neurovascular Surgery

2. Critically appraise sources of medical information on cerebrovascular pathologies and diseases.
3. Facilitate learning of patients, house staff/students and other health professionals.
4. Contribute to development of new knowledge cerebrovascular disorders.

Specific Requirements
The neurosurgical fellow must:
1. Adequately appraise sources of medical information and develop, implement and monitor a personal education strategy so as to become life-long learners.
2. Apply the scientific method, including the principles of epidemiology, to critically analyze the literature for continuing medical education and investigation.
3. Facilitate the learning of patients, medical colleagues, both junior and senior, and other health care professionals.
4. Strive to contribute to the discovery and development of new knowledge.

PROFESSIONAL
General Requirements
1. Deliver highest quality care with integrity, honesty and compassion.
2. Exhibit appropriate personal and interpersonal professional behaviours.
3. Practice medicine ethically consistent with obligations of a physician.

Specific Requirements
The neurosurgical fellow must:
1. Have a thorough appreciation of the necessity for methods of quality assurance in the delivery of health care.
2. Deliver the highest quality care with integrity, honesty and compassion, and understand the importance of bio-ethical issues in the delivery of health care.
3. Have the deportment of a professional including the demonstration of a sincere, caring attitude in dealing with patients.
4. Fulfill medical, legal, and professional obligations of the specialist.
5. Meets deadlines, be punctual, monitor patients, and provide appropriate and adequate follow-up.
6. Understand the principles of ethics and apply these in clinical situations.
7. Demonstrate self-assessment and seek and accept advice when necessary.