

## **McGill Pediatric Neuromuscular Fellowship**

The Montreal Children's Hospital, McGill University Health Centre

**Program directors :** Dr.Hugh McMillan and Dr Maryam Oskoui

**Number of available positions :** 2

**Type of Fellowship :** Clinical research fellowship

**Fellowship length :** 1 year

**Eligibility :** The candidates must have satisfactorily completed Pediatric neurology or psychiatry residency training as well as passed either the Royal College of Physicians and Surgeons of Canada examination or equivalent examination from another country.

**Funding:** Candidates must secure funding in order to apply for this Fellowship. Additional funding opportunities may be available through <https://www.cnsfederation.org> or <https://www.mcgill.ca/peds/education-training/pgme/funding>.

### **Hospitals involved in training:**

- Montreal Children's Hospital (Main site)
- Montreal General Hospital
- Montreal Neurological Hospital
- Royal Victoria Hospital, Glen site

### **Background:**

The Pediatric Neuromuscular Fellowship Program at The Montreal Children's Hospital within the McGill University Health Centre is a clinical research training program that offers qualified physicians exposure to clinical research, neuromuscular medicine and neurophysiological testing including: nerve conduction studies (NCS), electromyography (EMG) and other electrophysiology testing modalities.

The Neuromuscular Fellowship provides the trainee with exposure to patients with diseases of the nerve, neuromuscular junction and muscle and will be under the supervision of Dr. Hugh McMillan and Dr.Maryam Oskoui with the participation of other leading clinicians such as Drs. Poulin, O'Ferrall, Brais, Chalk, Massie and Gendron. Dr. Colin Chalk is the director of the Neuropathy and Myasthenia clinics at the Montreal General Hospital. Dr. Bernard Brais is a Neurogeneticist with expertise in the clinical and genetic aspects of neuromuscular diseases. Dr. Erin O'Ferrall, in conjunction with two neuropathologists, Drs. Jason Karamchandani and Joshua Sonnen, will provide exposure to muscle and nerve pathology as part of the fellowship. Dr. Massie is an expert in Motor Neuron Diseases and Diseases of the Peripheral Nerves. Dr. Gendron is the director of the EMG laboratory at the MNH.

In addition to the fellowship supervisors, the Montreal Children's Hospital, Montreal Neurological Hospital, the Montreal General Hospital and McGill University host a number of excellent clinical and basic science researchers who may collaborate with the fellow.

This fellowship aims to enable physicians, primarily those with training in Pediatric Neurology, to achieve: 1) an enhanced level expertise in the diagnosis, management and treatment of pediatric neuromuscular disorders; 2) competency and certification in neurophysiology and; 3) the skills necessary to pursue research as an independent investigator, co-investigator or collaborator in the area of clinical translational research.

### **Fellow Duties and Responsibilities**

The fellow will attend Neuromuscular, Neurogenetics, and EMG Clinics each week. There are no on-call or in-patient duties. The fellow is expected to attend Grand Rounds, Pediatric Neurology rounds, Neurophysiology rounds and Neuromuscular Journal club meetings. She/he/they will participate in the biweekly neuromuscular rounds where muscle and nerve biopsies will be reviewed with the neuropathologist and the geneticist.

Fellows be expected to complete a clinical research project and gain experience and confidence in conducting clinical trials. Fellows will be expected to take basic on-line training to understand the principles of “Good Clinical Practice” and ethical obligations when carrying out research projects. Under the mentorship and support of a Research Supervisor, Fellows will be expected to undertake or assist with one scholarly project leading to a poster, abstract or an oral platform presentation at a national or international conference.

### **Curriculum**

Fellows will gain clinical experience in caring for children with a wide variety of common and rare neuromuscular disorders in both outpatient and inpatient settings within an interdisciplinary team. Neurophysiology testing in infants and children takes place 3 half days per week at the Montreal Children’s Hospital. Further Neurophysiology training with adult patients is available in collaboration with colleagues at the Montreal General Hospital and the Montreal Neurological Hospital.

In clinic or EMG, the fellow will evaluate 2-4 patients per half day of clinic. The patient population will vary depending on the clinic. In the Neuromuscular Clinic approximately 50% of the patients have muscle or neuromuscular junction disorders and 50% of the patients have primary nerve or motor neuron disorders. In the Neurogenetics clinic the fellow will learn to use genetic testing and other genetic technologies for the diagnosis, genetic counseling and gene discovery of neuromuscular diseases. The fellow will also be expected to attend or give presentations at the academic rounds (described above) including the regular neuromuscular journal club. It will be expected that the trainee will be involved in at least one small research project during their fellowship with a maximum of three dedicated months. Fellows may also encouraged to present their work at a Division Rounds or Departmental Grand Rounds

The trainee will have the opportunity to attend the Canadian Child Health Clinician Scientist Program (CCHCSP) and Pediatric Health Research Epidemiology Statistics Curricula (PHRESCA) seminars and events.

## **General and Specific Objectives:**

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

#### **General Requirements**

- Demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
- Access and apply relevant information to clinical practice.
- Demonstrate effective consultation services with respect to patient care, education and legal opinions.

#### **Specific Requirements**

Provide scientifically based, comprehensive and effective diagnosis and management for patients with diseases affecting the muscle, nerve and neuromuscular junction.

#### **Clinical**

For a patient with a neuromuscular disorder, the fellow will be able to:

- Obtain a complete neurological history and a collateral history from other sources where necessary.
- Perform an appropriate detailed neuromuscular physical examination.
- Determine whether a patient's symptoms and signs are the result of a disorder related to diseases affecting the muscle, nerve and neuromuscular junction.
- Utilize clinical examination and neurophysiological testing to formulate an appropriate localization, differential and provisional diagnosis of the neuromuscular disorder if appropriate.
- Outline an appropriate plan of laboratory investigation.
- Interpret the results of EMG, muscle and/or nerve biopsy and genetic testing.
- Outline an appropriate therapeutic plan.
- Exhibit appropriate clinical judgment in outlining a differential diagnosis and an investigative and therapeutic plan, taking into account matters such as the patient's age, general health, risk and cost of investigative procedures, risk and cost of therapeutic interventions, and epidemiology of the disease.

#### **Technical Skills**

- To learn/review detailed, practical anatomy of the muscle, nerve and neuromuscular junction
- Other technical skills related to fellowship
  - EMG
  - muscle biopsy
  - histological interpretation of muscle biopsies
  - interpretation of genetic tests

## **Knowledge**

- Acquire and understand the neuroanatomic principles and pathological substrates of diseases affecting the muscle, nerve and neuromuscular junction.
- Understand the physiological changes that occur in the first few years of life and its impact upon neurophysiological testing
- Become familiar with the neurophysiological principles, the basic mechanisms related to diseases affecting the muscle, nerve and neuromuscular junction.
- Learn the major categories or classifications related to diseases affecting the muscle, nerve and neuromuscular junction.
- Learn clinical neuropharmacology related to diseases affecting the muscle, nerve and neuromuscular junction.
- Acquire expertise in the decision making related to diseases affecting the muscle, nerve and neuromuscular junction.
- Acquire mastery in the genetic diagnosis of neuromuscular disorders.

## **2. Communicator**

### **General Requirements**

- Establish therapeutic relationships with patients/families.
- Obtain and synthesize relevant history from patients/families/communities.
- Listen effectively.
- Demonstrate the ability to communicate difficult news to parents that can include severe and/or life-limiting neurological disease
- Discuss appropriate information with patients/families and the health care team.

### **Specific Requirements**

Communicate effectively with patients, their families and medical colleagues (particularly referring physicians), and other health care professionals in both the inpatient and outpatient settings. The fellow will:

- Communicate effectively and regularly with patients and their families.
- Be considerate and compassionate in communicating with patients and families, willingly provide accurate information appropriate to the clinical situation, with a reasonable attempt at prognosis.
- Learn to write concise reports of the clinical findings with conclusions and recommendations comprehensible to the non-specialist.
- Communicate effectively and appropriately with the nurses and paramedical personnel.
- When ordering investigative procedures, ensure there has been adequate communication about the patient with the person who will actually be doing and/or reporting the diagnostic study.

### **3. Collaborator**

#### **General Requirements**

- Consult effectively with other physicians and health care professionals.
- Contribute effectively to other interdisciplinary team activities.

#### **Specific Requirements**

Be an effective teacher of other physicians (including medical students and house officers), other health care personnel, and patients. The fellow will:

- Provide instruction to medical students and more junior physicians at a level appropriate to their clinical education and professional competence.
- Willingly share knowledge with others with whom they are associated, thus ensuring the most effective delivery of health care to patients.

### **4. Manager**

#### **General Requirements**

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

#### **Specific Requirements**

Be proficient in professional skills related to the diagnosis and treatment of neuromuscular diseases.

Demonstrate the following professional skills in time management:

- Recognize that effective use of time depends upon punctuality.
- Recognize that effective use of time requires planning.
- Develop speed as well as accuracy in clinical skills.
- Reserve time for reading and keeping current with the neurological literature.
- Establish routines for carrying out regular activities and adhere to them.

Maintain complete and accurate medical records:

- Record and maintain a complete and accurate medical record for every patient seen; this record should be completed in a timely manner and include the patient's history and the findings on physical examination, a differential diagnosis, a provisional diagnosis, Effectively coordinate the work of the health care team.
- Indicate, by the treatment plan, that for the optimal treatment of many patients with neurological disorder, a team approach is necessary -- members of the team may include

nurses, rehabilitation personnel (physiotherapists, occupational therapists, speech therapists, etc.),

- Psychologists, social workers, etc.
- Identify where an important role(s) can be played by disease focused lay groups with regard to helping the patient and/or family and to facilitate its happening.

## **5. Health Advocate**

### **General Requirements**

- Identify the important determinants of health affecting patients.
- Contribute effectively to improved health of patients and communities.
- Recognize and respond to those issues where advocacy is appropriate.

### **Specific Requirements**

- Learn about community resources and related patient support groups; provide assistance to access programs (e.g. home care, occupational and physiotherapy, drug plans, application for nursing homes etc) and participate in their activities.
- Educate, be able to generate and access information (e.g. printed material, video tapes web sites) and be available as a resource person to counsel patients effectively on neurological disorders.
- Counsel patients on the importance of taking responsibility for their own well-being and recognize the important determinants predisposing to worsening of neurological status
- Understand the role of national and international bodies (e.g. AAN, AANEM, Canadian Neurological Sciences Foundation) in the promotion of neurological health, and the prevention, detection, and treatment of peripheral nervous system disorders.

## **6. Scholar**

### **General Requirements**

- Develop, implement and monitor a personal continuing education strategy.
- Critically appraise sources of medical information.
- Facilitate learning of patients, house staff/students and other health professionals.
- Contribute to development of new knowledge.

### **Specific Requirements**

Be able to critically assess the neurological literature as it relates to patient diagnosis, investigation and treatment:

- Develop criteria for evaluating neurological literature.
- Critically assess the neurological literature using these criteria.
- Be familiar with the design of experimental and observational studies, especially randomized controlled trials.

- Be able to calculate absolute risk reductions, relative risk reductions and numbers needed to treat or harm.

Be able to participate in clinical or basic science studies as a member of a research team:

- Be able to describe principles of good research.
- Use the above principles, and be able to judge whether a research project is properly designed.
- Be prepared to present research findings to peers at local, national or international conferences.

## **7. Professional**

### **General Requirements**

- Deliver highest quality care with integrity, honesty and compassion.
- Exhibit appropriate personal and interpersonal professional behaviours with patients/families, peer residents, fellows and other health care professionals.
- Practice medicine ethically consistent with obligations of a physician.

### **Specific Requirements**

- Demonstrate personal and professional attitudes consistent with a consulting physician role:
  - Periodically review his/her own personal and professional performance against national standards set for the specialty.
  - Be willing to include the patient in discussions concerning appropriate diagnostic and management procedures.
  - Show appropriate respect for the opinions of fellow consultants and referring physicians in the management of patient problems and be willing to provide means whereby differences of opinion can be discussed and resolved.
- Be willing and able to appraise accurately his/her own professional performances and show that he/she recognizes his/her own limitations with regard to skill and knowledge by appropriately consulting other physicians and paramedical personnel when caring for the patient.
- Be willing and able to keep his/her practice current through reading and other modes of continuing medical education and develop a habit of maintaining current his/her clinical skill and knowledge base through continuing medical education.

## **Evaluation**

The Fellow will be evaluated by clinical performance, participation in teaching rounds and success in the research project undertaken. Evaluations will be carried out monthly, with formal feedback provided at regular intervals.

Evaluations will be completed quarterly by the Fellowship Program Director with input obtained from all Attending Physicians, Residents, Health Professionals, Technologists and Medical

Students with whom they have worked with. The feedback will encompass all of the CanMEDS roles including: Medical Expert, Scholar, Professional, Communicator, Collaborator, Leader and Health Advocate. Feedback will be shared verbally with the Fellow and documented in their academic dossier.

Training in the Pediatric Neuromuscular Fellowship cannot be recognized in itself for credentialing purposes as a training leading to certification by the Royal College of Physicians and Surgeons of Canada (RCPSC). The Fellow will be strongly encouraged to take an annual examination in neurophysiology / electromyography (EMG) held by the Canadian Society of Clinical Neurophysiologists (CSCN) every June, which coincides with the Canadian Neurological Sciences Federation Annual Meeting. Passing this examination is required by many Canadian academic centres in order to perform and report EMG studies

- The fellow will be formally evaluated regularly (at minimum once every period) using the Competency-By-Design format below :

Entrustability rating scale anchors

1. "I had to do" - requires complete guidance
  2. "I had to talk them through" - able to perform but requires repeated direction
  3. "I needed to prompt" - some independence but intermittent prompting required
  4. "I needed to be there just in case" - independent for most things but requires assistance for nuances
  5. "I did not need to be there" - complete independence
- The fellow will also get a periodic ITER/CanMEDS format-evaluation.