

Department of Neurology and Neurosurgery Clinical and Research

Clinical/Research Fellowship in Epilepsy and EEG

Type of Fellowship: 2-year clinical and research fellowship in Epilepsy and EEG.

Name of Fellowship Supervisor: Raluca Pana, MD, FRCP (C), CSCN (EEG)

Number of positions: 1-2 per year

Fellowship Information

This fellowship training program aims to provide advanced knowledge in epilepsy and EEG, and to allow the fellow to develop basic skills in clinical research. At the end of this fellowship, it is expected that the fellow will be able to act as an independent epileptologist in an academic environment.

Eligible candidates will need to apply for funding. Sources of funding include provincial or federal grant agencies such as CIHR and FRQS, the Montreal Neurological Institute and Hospital fellowships (Preston Robb and Jeanne Timmins), the Savoy Foundation for Epilepsy fellowship, Epilepsy Canada fellowship and the Canadian League Against Epilepsy fellowship. RAMQ funding can be obtained if the candidate is a graduate of a Quebec neurology residency program and has secured a position in a local hospital or CIUSS (PEM).

The fellowship includes rotations in the epilepsy monitoring unit (EMU), outpatient epilepsy clinics and EEG laboratory at the Montreal Neurological Institute and Hospital (MNI), as well as one to two months' rotation in pediatric EEG at the Montreal Children's Hospital.

Upon completion of the Fellowship, the trainee will:

- A. Possess a detailed knowledge and understanding of :
 - 1) Basic sciences (brain physiology underlying epileptogenesis, the etiologies underlying focal and generalized epilepsies, mechanisms of action of anti-seizure medications)
 - 2) Classification of seizures, epilepsy types and syndromes as well as the conditions in differential diagnosis of epilepsy
 - 3) Electroencephalography in the normal brain as well as various pathological states
 - 4) The indications and interpretation of the various investigations of seizures and epilepsy, with an emphasis on the adult population (including planning and interpretation of invasive studies)

- B. Become an expert in the of evaluation, investigation, and treatment of all types of epilepsy as well as its co-morbidities, including defining optimal polytherapy and adjusting therapy in special populations, such as the elderly, pregnant women and individuals with neurodevelopmental disorders.

- C. Conduct one research project during the year, including statistical and critical appraisal of the medical literature, design of a research protocol, data recording and analysis, and publication in a peer-reviewed journal.

- D. Establish and maintain an effective doctor-patient relationship

- E. Act as a consultant to other epileptologists, neurologists, general practitioners, as well as other health care professionals
- F. Function as an educator to patients, medical students, residents, colleagues, and other health care professionals
- G. Be a leader and role model in the establishment of practice guidelines and protocols for the institution and the community.
- H. Be an effective communicator as evidenced by the fellow's ability to summarize and present cases in seizure conference during the academic year.

The focus of the program is to build expertise in the pre-surgical evaluation of medically refractory epilepsy and to master alternative therapies for patients who are not surgical candidates.

The fellow will obtain further expertise in the neurophysiology and neuroanatomy of EEG, with training in the acquisition and interpretation of EEG signals in normal and pathological conditions. The fellow will become adept in the identification of EEG abnormalities not only in the presence of epilepsy but also in other neurological conditions as well as in the critically ill including patients with status epilepticus. The fellow will also learn about indications, planning and interpretation of invasive EEG studies.

During the second year of training, the fellow will be involved in the preparation and development of a research project, under the guidance of one of the faculty members in the Epilepsy group. The goal is to become familiar with clinical research from research design/conceptualization, ethics considerations and protocol approval, data acquisition and analysis, scientific presentations in conferences and manuscript preparation. There is 60% protected time for research during this second year which can be divided into dedicated periods or distributed through the year.

Epilepsy research faculty members' profiles can be found through the links in the MNI webpage: <https://www.mcgill.ca/neuro/research/groups/epilepsy>

Teaching Faculty

The MNI provides a unique environment for trainees, with experts in clinical and basic neurosciences spanning a large spectrum of interests and working together for patient care and the advancement of epilepsy research. The MNI epilepsy group faculty has a broad range of experience in clinical epilepsy, basic neurophysiology, imaging and genetics. The fellow will be exposed to modalities such as high-density EEG, intracranial EEG, EEG/fMRI, magnetoencephalography (MEG), high-resolution MRI and functional imaging.

Academic Facilities

The epilepsy fellowship program shares academic activities with the neurology residency program. Epilepsy fellows, therefore, attend the weekly neurology grand rounds, neurology academic half-day as well as special conferences organized by the department of neurology and neurosurgery, particularly when these pertain to their training in the field of epilepsy. In addition, they actively participate in seizure conferences (both local and regional) and weekly meetings in the EEG lab discussing the patients admitted to the EMU. They are invited to attend national epilepsy journal clubs, Canadian Epilepsy Teaching Network seminars and various other

virtual teaching activities throughout the year. In addition to bedside and informal teaching around the cases, specific teaching sessions include EEG and epilepsy seminars (the official teaching activities in this fellowship) and journal clubs dedicated to relevant clinical literature. The EEG and epilepsy seminars are scheduled regularly and cover a broad range of topics as well as case discussions to promote the acquisition of important knowledge necessary to become an independent epileptologist and EEG reader. Literature for the EEG examination and ILAE guidelines and protocols are reviewed in a friendly setting. There is an active research program offering resources for fellowship trainees to develop and pursue a clinical research project related to epilepsy. Library access and materials relevant to fellowship training are available seven days a week. The Brain Imaging Center fosters state-of-the-art MRI scanners, PET scanners and a MEG system, where our research program acquisitions and analyses take place.

Fellow's Duties and Responsibilities

Clinical responsibilities: The fellow participates in the EMU's activities and is responsible for the management of patients admitted to the EMU and of patients with seizures seen in consultation in the neurology, neurosurgery and intensive care units. The fellow will also be involved in the interpretation and reading of continuous EEGs performed daily in the EMU, including intracranial EEG. On-call requirements will be discussed with the fellowship program director but are usually limited to answering calls regarding patients in the EMU. The fellow may be asked to come see a patient after hours for a late admission or if a patient is unstable. Fellows are expected to review the EEGs of the patients admitted to the EMU over the weekend and present the findings at the weekly Monday morning rounds. They are expected to summarize the findings of the EMU admission and present them at seizure conference rounds. The fellows will also help supervise senior neurology and/or neurosurgery residents rotating in the EMU and EEG laboratory. The fellows are expected to take on teaching roles in the Resident Training Program, which may include presenting at Academic Half-Day or Morning Teaching Sessions. The fellow will work closely with the EEG technicians, particularly with those in charge of the EMU. Together with the attending epileptologist, they will participate in the decision-making process regarding the need for ongoing monitoring of patients in the EMU and the ICU.

Research responsibilities: The fellow will be involved in a research project, to be specified together with the faculty to act as research supervisor. During the first year, this can start in parallel to the clinical duties. The fellow will participate in various research meetings, conferences or courses. She/he will write a project to be developed for the second year of training, which should be submitted to funding agencies in order to obtain scholarship support. At the end of the research year, she/he is expected to dully perform data collection/analysis, to critically analyze and interpret results from the project and to write a scientific paper to be submitted for publication. In view of these aims, the program director will assist in ensuring that the research component of the fellowship takes place timely and feasibly.

Evaluation

The fellows will be given feedback regularly, based on information collected from the various

faculty members who supervise them during the year. Evaluations will be delivered face to face in every 3 months.

All fellows are considered learners at McGill and must therefore adhere to the student code of conduct.

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