Department of Neurology and Neurosurgery Clinical and Clinical Research Fellowship Application Form

Type of Fellowship: 2year Neurocritical Care
Name of the Fellowship Supervisor: Jeanne Teitelbaum MD FRCP
Fellowship Information:

- Number of fellowship positions requested: 2
- Name of hospitals involved in training
    - Montreal Neurological Institute

Description of Fellowship:

Introduction

Many critically ill patients suffer primary or secondary neurologic dysfunction. Through residency training, critical care and emergency neurology fellowships and continuing medical education, the neurological community will need to master a body of knowledge concerning the
special care of the critically ill patients with neurological disorders and incorporate this information into clinical practice, education and research. To this end, the members of the Critical Care and Emergency Neurology Section of the American Academy of Neurology have developed a core curriculum for critical care and emergency neurology. This curriculum is intended to serve principally as a tool for programs developing fellowships in Neuro Critical Care and Emergency Neurology. It also can serve as a guideline for the integration of the critical care and emergency neurology knowledge base and related skills in to the education of medical students, residents, fellows, and other medical and allied health care providers desiring education in this area.

Definition

Critical care and emergency neurology is a special area of neurology that focuses on the neurological disorders that affect critically ill patients. These can be primary neurologic disorders, or secondary to other systemic diseases that can affect the central nervous system, the peripheral nervous system or both. It includes understanding the effects of critical illness on the nervous system and the special vulnerabilities of the nervous system of patients in
intensive care units and other emergency settings. It requires knowledge of the disorders that frequently occur in these settingsas well as the methods of diagnosis, assessment, treatment, management and prevention of further injury. Critical care and emergency neurology also involves bridges into many medical and allied health specialties, including critical care medicine, emergency medicine, neurosurgery, nursing and social work. Development of the specialty of critical care and emergency neurology recognizes the special health needs of the population of critically ill patients with neurologic dysfunction, the characteristics of the nervous system in critically ill patients and the need for interdisciplinary collaboration in this field.

Goals and Objectives

The *primary goal* of the core curriculum in critical care and emergency neurology is to provide a training program that will prepare neurologists, anesthetists, neuosurgeons and medical intensivists to competently care for critically ill patients with neurologic disorders. This training must be based on supervised clinical work with increasing responsibility for inpatients. It should include not only the specific diseases of the nervous system of different age groups but also the neurological complications of medical and surgical conditions. Critical care and emergency neurology is particularly a procedure-oriented specialty and basic training in procedures used in neurocritical care must be included.
In the 2 year program, there is an additional, equally important goal, and it is here that the two programs differ most. In this program the resident is expected to spend 50% of his or her time in research. There will be instruction in basic and/or clinical neuroscience research and the applicant is expected to complete at least on project leading to presentation and, hopefully, publication.

The overall *objective* for specialty training in critical care and emergency neurology is to provide the skills and knowledge necessary to:
1. Provide high quality clinical care and assessments of critically ill patients with neurological disorders, including diagnostic evaluation, treatment, management, counseling and social intervention;
2. Work effectively with multidisciplinary teams oriented to the care of these patients; and
3. Develop the capacity to pursue an academic/research career focusing on neurological dysfunction in critically ill patients.
4. Develop the capacity to teach others in the methods and concepts used in the care of critically ill patients with neurological disorders.
5. Continue elaborating and completing research projects in Neurocritical Care.

Topics in Critical Care and Emergency Neurology
The topics listed below provide an outline of a core curriculum, in Critical Care and Emergency Neurology, for fellowship training. Many of the topics included can be used for educational programs in Critical Care and Emergency Neurology for medical students, neurology residents,
Academic neurologists and neurologists in practice. All educational components of a fellowship program should relate to the program goals listed above.

Brain Death
Coma
Encephalopathies and Delirium
Herniation Syndromes
Hydrocephalus
Intracranial hemorrhages:
Epidural
Subdural
Subarachnoid
Parenchymal (supratentorial, cerebellar, brainstem)

Intraventricular
Cerebral Venous Thrombosis
Acute Anterior Cerebral Artery Occlusion
Acute Carotid Artery Occlusion
Acute Middle Cerebral Artery Occlusion
Acute Basilar Artery Occlusion
Brainstem Infarction
Cerebellar Infarction
Hemispheric Infarction

Acute Spinal Cord Syndromes
Cerebral Blood Flow and Hypoperfusion
Cerebral Metabolism and Oxygen Demand
Cerebral Edema
Syncope
Brain Abscess
Encephalitis: Bacterial and Viral
Meningitis: Bacterial and Viral
Traumatic Brain Injury
Traumatic Spinal Cord Injury
Status Epilepticus
Guillain-Barre' Syndrome
Myasthenia Gravis
Equipment and Technologies: Knowledge of the basic physiology and underlying technical principles.
Cardiovascular and Pulmonary Monitoring Devices
Intracranial Pressure Monitors: Fiberoptic, Intraventricular, and Epidural
Noninvasive Intracranial and Extracranial Vascular Study, Including Transcranial Doppler
Blood pressure management in the context of severe neurologic disease
General Principles of Management of critically ill Neurologic Patients
General Perspectives of Care in critically ill Neurologic Patients
General principles in the assessment of sedation, agitation, delirium and pain using objective criteria.
Management of Agitation delirium and Pain
Management of Airway and Mechanical Ventilation
Management of Nutrition
Management of Intravascular Volume Status and Blood Pressure
Management of Anticoagulation and Thrombolytic Therapy
Management of Intracranial Pressure
Management of Neurologic Complications in Critically Ill Patients
Management of Post-operative Neurosurgical Patients
Management of Systemic Complications in Critically Ill Neurologic Patients
Management of Pulmonary Complications
Management of Cardiac Complications
Management of Acid-Base Disorders and Hypertonic and Hypotonic States

Management of Gastrointestinal Complications
Management of Nosocomial Infections
Intensive Care Unit Organization and Management
Psychosocial Issues in the Intensive Care Unit
End of Life Decision Making
Transplant and Organ Donation Management

Description of activities and responsibilities:

- **Research activity and publications related to fellowship**
  Please refer to the supervisor's CV, appended to this submission
  There are many projects that will begin in 2009. The supervisor (J Teitelbaum) in conjunction with Dr Jean-Paul Soucy of the Neuro-imaging center, have obtained a $100,000.00 grant that will allow the funding of a quantitative SPECT scan. Several research protocols using the SPECT have been elaborated, notably for research in sub-arachnoid and intracerebral hemorrhage. As well, we hope to do some work on prognosis in coma post cardiac arrest using PET and functional MRI.
  Collaborative work is organized with Dr Yoanna Skrobik looking at objective methods of delirium, pain and sedation assessment in the Neurocritical Care population. Literature reviews are presently underway and grant applications will be submitted by September 2010.
  Projects are being elaborated in the domain of severe meningitis.

  The two year program places particular emphasis on this aspect of the fellowship. The Fellow can participate in a previously elaborated or ongoing project. Alternatively, they can design their own research project. If this project is acceptable after analysis by the staff, tools and guidance will be provided to ensure its completion.

Mission statement for fellowship

The mission is to promote:

- ***Quality Patient Care*** by identifying and implementing best medical practices for acute neurological disorders that are consistent with current scientific knowledge, and that promote compassionate care and respect for patient-centered values.
- ***Professional Collaboration*** by providing a forum for communication, collaboration, and exchange of ideas between physicians and allied health-care professionals within different specialties who care for critically-ill neurological patients.
- ***Research*** by fostering clinical, experimental and outcomes research focused on developing innovative and cost-effective medical and surgical interventions for acute neurological disorders.
- ***Training and Education*** by developing standards for advanced fellowship training, program accreditation, and physician certification in the subspecialty of neurological intensive care.
- ***Advocacy*** by making the case to patients, the public, policy makers and other healthcare professionals that complex, life-threatening neurological diseases are best cared for by a multidisciplinary team with special expertise in neurocritical care.

- Source of funding for fellowship:
    - Yasser Abulhasan (July 2010 to July 2012): funding from the government of Kuwait

Names of the Teaching Faculty

- Jeanne Teitelbaum MD FRCP
    - Director of the program
    - Direct supervision in the NICU
    - Co-director of a research project
    - Summary of clinical practice: full-time accredited Neurologist Neuro-intensivist with 18 years of neurocritical care practice as well as previous intensive care, internal medicine and family medicine practice.

- Mark Angle MD FRCP
    - Roles: chief of Neuroanesthesia as well as chief of the Neuro ICU
    - Direct teaching and supervision in the NICU
    - Direct teaching and supervision in the operating room
    - Co-directorship of research projects
    - Summary of clinical practice: full-time accredited inensivist in medical, surgical and neurological critical care as well as an accredited neuro-anesthetist. Full time clinical practice
    - Major Strengths: superb clinician in neuro-anaesthesia and critical care

- Marcello Lannes MD FRCP
    - Roles: Full time in Neuroanesthesia as well as Neuro ICU
    - Direct teaching and supervision in the NICU
    - Direct teaching and supervision in the operating room
    - Co-directorship of research projects
    - Summary of clinical practice: full-time accredited inensivist in medical, surgical and neurological critical care as well as an accredited neuro-anesthetist. Full time clinical practice
    - Major Strengths: Masters in education as well as superb clinical skills in neuro-anaesthesia and critical care

Academic Facilities

- The fellow will be using the facilities of the Neurological Intensive Care for his clinical and academic pursuits. The unit has a conference room and access to internet as well as Up-to-date on it's 3 computers. The fellow will be able to share an office and have his own desk on the 3rd floor.
- Library access is available at both the MNI and the Royal Victoria Hospital. Materials relevant to fellowship training are kept in the conference room and the office of the assistant head nurse in the NICU.
- Multimedia learning materials available on CD and internet. These allow learning in Neuroanatomy, neurophysiology, stroke, multiple sclerosis and neurocritical care. There is also access to *Up To Date.*

Fellow Duties and Responsibilities

- Call responsibilities to cover service: the fellow is on call one in 4 week days as well as one week-end per month. He is on first call from home and replaces the NICU attending. He or she does not replace the neurology or neurosurgery resident whose job it is to assess and admit the patient. The resident goes over admissions with the fellow. The attending is on as second call to supervise the fellow.
- The fellow is expected to supervise residents rotating through the ICU with the help and instruction of the attending.
- The fellow with a background in Critical Care will rotate only at the Montreal Neurological Institute and hospital. The fellow with a background in Neurology will rotate at the Royal Victoria, in the medical/surgical intensive care. Rotations are not fixed in advance and will vary according to the needs of the candidate.
- What are the outpatient clinic responsibilities: there are no outpatient clinic responsibilaties.
- What are the teaching responsibilities towards residents: the fellow is expected to present one subject a week at 2PM teaching rounds.
- Outline participation in academic activities involving the residents: the resident will participate in service rounds. The fellow will either present or assist the 2PM teaching rounds.
- Describe any support staff available to the fellow: the fellow will have access to the stroke nurse clinician and the secretary.
- Proposed meetings to be attended by the fellow: the fellow will be expected to attend the American Neurocritical Care conference, this year in Miami, as well as the Toronto Critical Care conference.
- What is the research productivity/publications expected by the Fellow: one project, hopefully with a subsequent publication.

Curriculum

- *In order to create an environment conductive to academic activity, the intensivist may involve residents whose time is dedicated to the unit, in the active care of patients. This will be complimentary to the responsibilities of the referring services who will maintain their primary role.*

  The resident in training will actively involve himself / herself in the monitoring of all admitted patients. The resident should be present in the ICU from 8AM to 5PM. Chart notes on a daily basis are required.

  Bedside rounds occur each morning and the resident is expected to attend, along with the nurse responsible for the patient and the NICU attending.

  The resident will actively participate in teaching rounds within and outside the ICU context.

  Call in the NICU is taken from home. Frequency is never more than 1 in four, with one weekend per month, and can vary according to individual requirements.

- Intended case load for the Fellow: there are a total of 14 beds in the NICU. The Fellow is responsible for the care of these patients under the supervision of the attending. He will also coordinate the activities of the residents rotating through the NICU.

- Intended percentages of the varieties of cases: there is a large variety of cases, 60% surgical pathology, 40% neurological pathology as the primary problem. All the pathologies listed in the section called topics are more than likely to be encountered.

- What regular reading materials are to be provided (if any):

    - There is a small library in the NICU that contains the latest textbooks in Neurocritical Care. These are available to the resident on a consultative basis. There are also textbooks on coma, Neurology, and the Neurological exam. Unlike the US, most of our fellows are likely to be internal medicine and critical care residents rather than Neurology residents. In these cases, teaching of basic Neurology becomes one of the goals of the fellowship and the textbooks reflect this.

- Outline the weekly / monthly conference schedule

    - Afternoon course from 2 to 3 PM 3 days per week, 3 out of 4 weeks
    - Neurology service rounds: once per week
    - Grand Rounds in Neurology: once per week
    - Grand rounds in Neurosurgery: once per week
    - Stroke rounds: once per month

- What role will the Fellow play in attending, organizing, and presenting rounds/conferences
    - The fellow will present one afternoon course per week

Evaluation:

The fellow will be evaluated every month using CANMEDS criteria. They will also be able to write a practice exam based on the American Neurocritical Care sub-specialty exam.