



Adult Neurology Residency Training Program McGill University Rotation Outline and Goals and Objectives

Electromyography/Neuromuscular Rotation

Outline of rotation

All residents participate in a 3 period EMG/neuromuscular disease rotation. The rotation may take place during PGY3 or PGY4. This rotation, which takes place at the Montreal Neurological Hospital, the Montreal General Hospital or occasionally the SMBD-Jewish General Hospital, combines practical training in clinical electrophysiology with exposure to a large volume of common out-patient disorders of the peripheral nervous system. Residents will participate in the performance and interpretation of nerve conductions and electromyography. As well, residents will attend weekly Neuromuscular and Neuropathy clinics where they will have exposure to a wide range of nerve and muscle diseases.

Overall goals of rotation

1. To provide the fundamental training in neuromuscular diseases necessary for the competent practice of neurology regardless of the specific subspecialty interest of the neurologist. More specifically, all neurology trainees should accomplish the following during this rotation:
2. To become competent at examining patients with generalized and focal peripheral neuropathies, primary muscle diseases, disorders of the neuromuscular junction, anterior horn cell disorders.
3. To become familiar with the criteria for diagnosing patients in these specific disease categories.
4. To learn how to investigate patients with neuromuscular diseases to establish or confirm the diagnosis and where appropriate to attempt to determine the specific cause.
5. To gain experience in the treatment of neuromuscular diseases, the role of physiotherapy, genetic counseling.
6. EMG techniques: To learn
 - a. The important principles underlying nerve conduction studies and

needle EMG examination.

- b. To understand the role and the limitations of these techniques in the diagnosis of neuromuscular diseases.
- c. To become familiar with the approaches for evaluating patients with the neuromuscular disorders listed above.
- d. To be able to understand reports from an EMG Laboratory.
- e. To understand the basic principles of the technical equipment used in the EMG Laboratory.

7. Nerve-muscle histopathology: To learn

- a. The indications for and limitations of nerve and muscle biopsies

EMG/Neuromuscular Rotation 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 Objectives

Provide scientifically based, comprehensive and effective diagnosis and management for patients with neurological disorders.

Clinical

For a patient with a neuromuscular or allied disorder, the resident will be able to:

- Obtain a complete neurological history from adults and children obtaining a collateral history where necessary
- Perform an appropriate physical examination.
- Determine whether a patient's symptoms and signs are the result of a disorder referable to the peripheral nervous system
- Formulate an appropriate localization, differential and provisional diagnosis of the neuromuscular disorder if appropriate.
- Outline an appropriate plan of laboratory investigation.
- 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 peripheral nervous system.
- To improve and refine the clinical examination of the peripheral nervous system. In particular, to confidently and accurately evaluate representative muscles innervated by all major nerve roots and somatic motor nerves, and to distinguish between true weakness and give-way weakness.
- To gain experience with the diagnosis of the common PNS disorders: carpal tunnel syndrome, polyneuropathy, cervical and lumbar radiculopathy, lumbar and cervical spinal stenosis, ulnar neuropathy, peroneal neuropathy, meralgia paraesthetica. .
- To learn how to interpret nerve conduction studies.
- To gain experience performing the common motor and sensory nerve conduction studies.
- To learn how to perform and interpret the findings from concentric needle examination. Basic technical skills include the ability to accurately locate commonly examined muscles and methods to minimize patient discomfort. Residents should be able to recognize and understand the significance of the following EMG phenomena (a basic but not comprehensive list):
 - Insertional activity (normal, increased, decreased)
 - End plate. noise and end plate spikes
 - Fibrillation potentials and positive sharp waves
 - Complex repetitive discharges (CRD's)
 - Myotonic discharges
 - Motor unit potential duration and amplitude
 - Motor unit potential recruitment (normal, decreased, increased or rapid)
 - Motor unit potential polyphasia
 - Large ("neurogenic") motor unit potentials

Knowledge

- Acquire and understand the neuroanatomic principles and pathological substrates of disorders of the peripheral nervous system.

- Become familiar with the neurophysiological principles, the basic mechanisms of neural transmission and principals of clinical electrophysiological studies.
- Learn the major categories of diseases, congenital, genetic and acquired of the anterior horn cell, nerve roots, mixed peripheral nerves, neuromuscular junction and muscles.
- Learn clinical neuropharmacology related to the treatment of: i. neuropathic pain, ii. Myasthenia gravis, iii. Immune-mediated disorders of the peripheral nervous system.
- Acquire expertise in the decision making related to nerve and muscle biopsies.

2. Communicator

General Requirements

- Establish therapeutic relationships with patients/families.
- Obtain and synthesize relevant history from patients/families/communities.
- Listen effectively.
- 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 resident 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 electrophysiological findings with conclusions and possibly 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 resident 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 peripheral nervous system/neuromuscular disorders.

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 will include the patient's history and the findings on physical examination (including the neurological 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. ALS Society) 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 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.