

## Neuromuscular Elective Rotation Goals and Objectives

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### ACTIVITIES: Schedule

- Goals: Learn Clinical, Neurophysiological and Laboratory aspects of NM disease
- Length of rotation: 4-8 weeks (ideally). Note, we strongly encourage residents to spend a minimum of four contiguous weeks on the rotation. Without this continuity, it is difficult to obtain maximal benefit from the experience.
- Conferences
  - Monday 7:30-8:30 am
    - Electrodiagnostic Medicine Lecture Series; Choi McM 2
  - Tuesday 7:30-8:30 am
    - Neuromuscular/EMG Clinical Case and Quality Improvement conference; McM 2 (Choi)
  - Wednesday 7:30-8:30 am on the Wednesday of the 2<sup>nd</sup> full week of the month
    - NM Grand Rounds Choi McM 2
  - Wednesday 2:30-4pm
    - NM Pathology Conference; IWJ 406 (scope room)
  - Wednesday (thru 12/31)
    - 4 pm-5pm Neuromuscular Medicine lecture; McM 4 (O'Leary)
  - Wednesday (after 1/1)
    - 1:30 pm-2:30pm Neuromuscular Medicine Lecture; McM 2 (Choi)
  - Friday 12:15-1:15 pm Journal Club; McM 4 (O'Leary)
  - Saturday 10:00 am-12pm Muscle & Nerve Pathology Signout; IWJ 406
- Clinical activities – **each rotator should contact Drs. Bucelli, Pestronk or Al-Lozi in advance of the rotation to personalize structure based on resident's goals for the rotation.** The possibility activities to build a schedule from include:
  - Monday – beyond attending morning conference (all rotators), options include:
    - Neuromuscular inpatients and infusion center patients; BJH and SLCH
    - Neuromuscular clinic with Dr. Bucelli, Monday am at CAM6C
    - EMG lab at CAM 6H
  - Tuesday - beyond attending morning conference (all rotators), options include:
    - Neuromuscular inpatients and infusion center patients; BJH and SLCH
    - EMG lab at CAM 6H
    - 2<sup>nd</sup> Tuesday afternoon each month: Pediatric NM clinic; SLCH Suite 2D (Zaidman)
    - ALS clinical trials opportunities with Drs. Bucelli and Miller
  - Wednesday
    - Neuromuscular inpatients and infusion center patients; BJH and SLCH
    - MDA clinic in the am, LL McMillan, Pediatric and Adult (Zaidman, (Pestronk on the 2<sup>nd</sup> Wednesday of the month)), 7:30 am – Noon
    - CAM 6C clinic in the am, Sommerville
    - Afternoon: Conferences & Biopsy Reading as per above
    - EMG lab at CAM 6H
  - Thursday
    - All day neuromuscular Clinic; CAM 6C
    - Neuromuscular inpatients (before and after clinic); BJH and SLCH
    - EMG lab at CAM 6H

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- Friday
  - Journal Club at 12:15 pm
  - Neuromuscular inpatients and infusion center patients; BJH and SLCH
  - EMG lab at CAM 6H
  - Friday afternoon on 3<sup>rd</sup> Friday of the month – Cardiology/NM clinic in CAM (must be set up in advance)
- Saturday (Optional BUT STRONGLY ENCOURAGED): Neuromuscular biopsy reading (10:15-1)
- **NOTE: Activity times can be modified to accommodate individual resident's clinic schedules or academic interests**

## REQUIREMENTS

- Keep a log of all cases you examine
- Keep a portfolio of your presentations during the rotation
- Discuss consult cases with Neuromuscular Fellow before presentation

## ELECTRODIAGNOSTIC TOPICS: Covered in neuromuscular rotation & EMG electives

- Anatomy of the peripheral nervous system
- Physiology of the nerve and compound motor action potential
- Learn the basics of NCS
  - Sensory NCS
    - Normal adult values and NCS techniques of sural, median and ulnar
  - Motor NCS
    - Normal adult values and NCS methods of median, ulnar, peroneal and tibial
  - Late Responses
    - F wave
    - H wave
  - Repetitive Nerve Stimulation
    - Slow rate (2 Hz)
    - Fast rate (30 Hz)
- Learn the basics of EMG
  - Needle safety and universal precautions
  - Fibrillation potentials
  - Positive Sharp Wave potential
  - Fasciculations
  - Normal vs. abnormal motor unit potential morphology
  - Normal vs. abnormal recruitment patterns
  - Needle placement and technique
- NCSs and EMG patterns in different diseases
  - Myopathies
  - Neuromuscular junction disorders
  - Peripheral neuropathies
  - Entrapment Neuropathies
  - Plexopathies
  - Radiculopathies
  - Anterior horn cell diseases

## Goals & Objectives: Neuromuscular Elective Rotation for Neurology and Pediatric Neurology Residents (PGY2, PGY3 and PGY4 residents)

The goals of the Neuromuscular Elective rotation are for residents to learn the clinical, neurophysiological and laboratory aspects of neuromuscular disease. Residents should become familiar with the basics of diagnosis, management and treatment of neuromuscular disorders. Residents will see patients with neuromuscular disorders in

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outpatient Neuromuscular Clinics and the inpatient service.

Residents should master the basic aspects of these objectives and senior (PGY4) residents that spend additional time or return for additional rotations should develop a more nuanced and complete understanding and engage in more independent patient care and evaluation.

### **Patient Care**

**Goal:** The resident rotating on the Neuromuscular Elective must develop skills needed for diagnosis and management of patients with neuromuscular disorders. The resident will round with the neuromuscular attending and fellows on hospitalized patients, see new inpatient neuromuscular consultations, and participate in the outpatient neuromuscular clinic and evaluate patients in the electrodiagnostic lab. The resident is expected to:

#### **Objectives:**

- Learn to obtain a focused history pertaining to neuromuscular diseases and to obtain a clear description of the patient's symptoms.
- Learn to identify and treat diseases common in this patient population.
- Round with the neuromuscular attendings and fellows on hospitalized patients and see new inpatient neuromuscular consultations.
- See patients in the neuromuscular clinic and staff cases with neuromuscular faculty.
- In conjunction with the neuromuscular attending, develop and institute a treatment plan for patients seen in the clinic and as inpatient consultations.
- Complete written notes in a timely and comprehensive manner.

### **Medical Knowledge**

**Goal:** The resident on the Neuromuscular Elective will develop a knowledge base for the diagnosis and treatment of neuromuscular disorder. Residents are expected to:

#### **Objectives:**

- Develop better knowledge of the epidemiology of neuromuscular diseases.
- Learn neuromuscular clinical concepts:
  - The typical clinical, EMG, nerve conduction and biopsy features of:
    - Myopathy
    - NMJ disorders
    - Neuropathy: Axonal; Demyelinating; Neuronopathy
  - The methods and uses of testing, including:
    - Examination: General; Cranial nerves; Motor; Sensory; Reflexes; Quantitative motor & sensory testing
    - Electrodiagnostic testing
    - Muscle and nerve biopsy
    - Antibody testing:
      - Myositis-specific
      - MG (e.g., AChR & MuSK)
      - Neuropathy (e.g., GM1; MAG; Sulfatide; TS-HDS; Hu)
  - Rehabilitation: Concepts & methods
  - Neuromuscular genetics and hereditary disorders- familiarize yourself with the genetic, clinical, physiologic and pathological features of:

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- Duchenne and Becker muscular dystrophy
- Limb-Girdle MDs
- Myotonic dystrophy (DM1 and DM2)
- Facioscapulohumeral (FSH) dystrophy
- Charcot-Marie-Tooth (CMT) type 1A & HNPP
- Spinal muscular atrophy
- Bulbo-spinal muscular atrophy (BSMA; Kennedy's disease)
- Amyotrophic lateral sclerosis
- Immune & inflammatory disorders: learn the clinical, immune, physiologic, pathological and treatment features of:
  - Immune & Inflammatory Myopathies
  - Myasthenia gravis & Myasthenic syndromes (LEMS)
  - Immune neuropathies
    - Demyelinating: e.g., CIDP; MMN; POEMS; MAG
    - Antibody related: e.g., GM1; MAG; Hu; TS-HDS
    - Acute: e.g., GBS; Motor; Autonomic; Miller-Fisher
- Other disorders
  - There are many!!!
  - Diabetic neuropathy: Types
  - Facial paralysis (Bells palsy)
  - Entrapment neuropathies (e.g., Carpal tunnel)
  - Neuralgic amyotrophy
  - Lumbar and brachial plexopathies
- Learn principles of treatment of neuromuscular disorders, the clinical pharmacology and the pharmacokinetics of the drugs used to treat these disorders and learn how to use these medications in this patient population, including:
  - Corticosteroids
  - Rituximab
  - Cyclosporine A
  - Methotrexate
  - Azathioprine
  - CellCept
  - Cyclophosphamide
  - IVIg
  - Plasma exchange

### **Practice-based Learning and Improvement**

**Goal:** The resident rotating on the Neuromuscular Elective must develop the ability to refine their care of neurological patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:

#### **Objectives:**

- To prioritize clinical responsibilities, provide timely service, and seek appropriate consultation and support.
- Develop the ability to use information technology to improve the practitioner's fund of knowledge and technical skills to provide better care to patients.

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- Develop the ability to use information technology to improve the practitioner's fund of knowledge and technical skills to provide better care to patients.
- Regularly attend group meetings including Case Studies conference, Neuromuscular/EMG conference, Pathology Conference, Clinical Neurophysiology lecture, Journal Club and Muscle & Nerve biopsy reading.
- Attend other neurology conferences as time allows.
- For interested residents, we welcome you to pursue an independent research project and prepare a presentation.

## Interpersonal and Communication Skills

**Goal:** The resident rotating on the Neuromuscular Elective must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:

### Objectives:

- Communicate effectively with other health care professionals regarding the management of Neuromuscular patients, including communication with the patient's primary care physician and other caregivers, and with other treating physicians in the ED and inpatient services as needed.
- Communicate with patients and their families in easily understood and culture-sensitive language.
- Work effectively as both a member of a professional group and as a group leader.
- Demonstrate the ability to serve as a consultant to colleagues and health care professionals.
- Maintain comprehensive, timely and legible medical records.

## Professionalism

**Goal:** The resident rotating on the Neuromuscular Elective must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

### Objectives:

- Learn effective communications skills with professionals from other areas of medical practice including internal medicine, general surgery, and surgical subspecialties.
- Understand good and bad communication behavior and leadership characteristics.
- Demonstrate appropriate nonverbal behavior.
- Have a commitment to carrying out professional responsibilities.
- Adhere to ethical principles.
- Develop sensitivity to a diverse patient population, with respect for colleagues and other health professionals.
- Function well as a team member.

## Systems-based Practice

**Goal:** The resident rotating on the Neuromuscular Elective must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

### Objectives:

- Describe the responsibility of the individual physician to the patient, the practice

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and the overall health care system.

- Describe the concepts of cost containment and cost-effectiveness and learn the relative cost to the patient and society of studies and treatments requested.
- Describe methods for ensuring that the practitioner and the practice group use scarce resources in a sound, thoughtful and cost-effective manner.
- Develop necessary skills required for the independent practice of neurological care.
- Understand the role of the electronic database and other electronic medical records as they pertain to inpatient neurological care.
- Understand how to utilize available resources in the hospital and clinic and via electronic media to improve patient care and outcomes.

**Evaluation:** The resident is evaluated by the full-time faculty attendings working with the resident, with additional input from the Neuromuscular fellows, staff and patients.