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  G. How to Document Muscle Biopsies
  H. GMEC Fatigue Guidelines
Welcome to the University of Kansas Neuromuscular Medicine fellowship program. We look forward to this academic year with an excellent fellow. Our continued focus on clinical research, inpatient and outpatient clinical evaluations, diagnostic, procedural and technical skills essential to the performance of Neuromuscular Medicine is reflected in both our didactic and clinical experiences.

This is a one-year ACGME-accredited fellowship at the University of Kansas Medical Center. We offer a variety of experiences in many different settings. The experience includes opportunities to observe, evaluate, and manage inpatients and outpatients of all ages with a wide variety of disorders of the nervous system and muscles, as well as to learn the effectiveness of diagnostic and therapeutic procedures. Experiences at the Landon Center on Aging, the University of Kansas Hospital, Kansas City Veterans Administration Medical Center and the Clinical Translational Research Unit (CTSU) provide opportunities to work with medical professionals as well as assist patients with medical problems. Neurologists successfully completing the program, once certified in Neurology, will be eligible for certification by the American Board of Psychiatry and Neurology in Neuromuscular Medicine.

We believe our program will prepare fellows for careers in private practice and academic settings. We look forward to working with you this year!

Mazen M. Dimachkie, MD
Program Director
FELLOWSHIP ROTATIONS

The emphasis of the fellowship training is on the evaluation and care of the patients suffering from neuromuscular disorders in adulthood and childhood, with direct patient care responsibilities. Fellows actively participate in the weekly Muscle Biopsy/Journal Club and Neuromuscular/EMG and EBM lecture series. Fellows’ educational didactic offerings are further detailed under Educational Programs.

The fellowship consists of five rotations:

A. NEUROMUSCULAR EVALUATION ROTATION (NMM Clinic)
B. ELECTROMYOGRAPHY ROTATION (EMG Lab)
C. MUSCLE, NERVE AND SKIN PATHOLOGY ROTATION
D. REHABILITATION MEDICINE ROTATION
E. NEUROMUSCULAR RESEARCH ELECTIVE ROTATION

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<thead>
<tr>
<th>Type of Experience</th>
<th>Structure</th>
<th>Amount of Time (months)</th>
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<tr>
<td>NMM Rotation 1 (NMM Consult)</td>
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<tr>
<td>Research</td>
<td>2 half-days/week</td>
<td>5</td>
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<tr>
<td>ALSA Clinic / PT / OT / RT</td>
<td>1 half-day/week</td>
<td>5</td>
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<tr>
<td>Neuromuscular Clinic</td>
<td>2 half-days/week</td>
<td>5</td>
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<tr>
<td>Muscle, Skin &amp; Nerve Biopsy</td>
<td>1-3 half-days/week</td>
<td>5</td>
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<tr>
<td>Outpatient EMG</td>
<td>2 half-days/week</td>
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<tr>
<td>NMM Hospital Consultations</td>
<td>2 half-days/week</td>
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| NMM Rotation 2 (Inpt EMG/IOM)                   |                 |                         |
| Research                                        | 2 half-days/week| 1                       |
| Neuromuscular Clinic                            | 2 half-days/week| 1                       |
| Muscle, Skin & Nerve Biopsy                     | 2-4 half-days/week| 1                  |
| Inpatient EMG/IOM                               | 2 half-days/week| 1                       |
| Outpatient EMG                                  | 2 half-days/week| 1                       |

<p>| NMM Rotation 3 (MDA Clinics – Adult and Peds)   |                 |                         |
| Research                                        | 2-4 half-days/week| 4                       |
| ALSA Clinic / PT / OT / RT                      | 1 half-day/week | 4                       |
| Adult MDA Clinic                                | 1 half-day/week | 4                       |
| Pediatric MDA Clinic                            | 0.5 half-day/week| 4                    |
| Neuromuscular Clinic                            | 2 half-days/week| 4                       |
| Muscle, Skin &amp; Nerve Biopsy                     | 1.5-3.5 half-days/week| 4                  |</p>
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<tr>
<th>VA Rotation</th>
<th>Days/Wk</th>
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<tr>
<td>Research</td>
<td>2 half-days/week</td>
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<tr>
<td>VA Neuromuscular Clinic</td>
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<td>Outpatient EMG</td>
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<tr>
<td>Muscle, Nerve &amp; Skin Biopsy</td>
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PROGRAM GOALS, OBJECTIVES, AND COMPETENCIES BY ROTATION

The goal of training in Neuromuscular Medicine is to provide the resident with the opportunity to develop the expertise necessary to evaluate and manage patients with neuromuscular disorders using specialized procedures and techniques.

It is the intent of the Neuromuscular Medicine training program to develop neurologists and physical medicine and rehabilitation specialists into competent neuromuscular specialists. Neurologists/physiatrists successfully completing this program will be eligible for Neuromuscular Medicine subspecialty certification by the American Board of Psychiatry and Neurology. The object is to provide residents with the opportunity to develop the expertise necessary to evaluate and manage patients using the procedures and techniques of Neuromuscular Medicine and that all trainees will pass the certifying examination.

Neuromuscular Medicine includes the assessment of selective neurological disorders involving central, peripheral and autonomic nervous systems and muscles. Assessment, monitoring and treatment are involved in electrophysiological testing in combination with clinical evaluation.

The goals of the training program include extensive experience in neuromuscular clinical evaluation, rehabilitation, nerve and muscle pathology, motor and sensory conduction studies and diagnostic electromyography. Familiarity with single fiber electromyography, skin pathology and autonomic function is included.

Clinical competence in Neuromuscular Medicine requires:

a. a solid fund of basic clinical knowledge and the ability to maintain it at current levels for a lifetime of continuous education
b. the ability to perform an adequate history and physical examination
c. the ability to appropriately order and interpret diagnostic tests
d. adequate technical skills to carry out selected diagnostic procedures
e. clinical judgment to critically apply the above data to individual patients
f. attitudes conducive to the practice of neurology, including appropriate interpersonal interactions with patients, professional colleagues and supervisory faculty, as well as paramedical personnel
g. personal integrity
h. regular, timely attendance at educational activities in the Department of Neurology
i. timely dictation of test reports and appropriate letters and phone calls to referring physicians
j. recognition of professionals
k. controversial issues require direct and immediate participation of the responsible attending supervising physician

Basic neuroscience pertaining to Neuromuscular Medicine includes knowledge of neuroanatomy, neuropharmacology, neurophysiology, neurochemistry and neuropathology in normal and disease states.

The fellow will have the instruction and practical experience to permit him or her to develop diagnostic, procedural, technical and interventional skills essential to the performance of Neuromuscular Medicine.
The experience includes opportunities to observe, evaluate and manage inpatients and outpatients of all ages with a wide variety of disorders of the nervous system and muscles as well as to learn the effectiveness of the procedure. The opportunity includes experience in clinical diagnosis and accumulation/interpretation of laboratory data relevant to these disorders as part of the outpatient and inpatient diagnostic evaluations with good support from pathology, rehabilitation medicine and radiology.

Basic clinical knowledge should include the neuromuscular aspects of the nervous system:

a) motor neuron disease
b) myopathy/neuromuscular transmission disorders
c) peripheral neuropathy
d) cranial/spinal single and multiple neuropathies
e) polyneuropathy: infectious/inflammatory
f) inherited neuropathy
g) polyneuropathy: ischemia/physical agents/toxins
h) polyneuropathy/systemic disease

Basic and clinical Neuromuscular Medicine topics will be covered during the one-year training period through a combination of clinical experiences of both inpatient and outpatient, basic and clinical Neuromuscular Medicine conferences and EMG case conferences.

The Neuromuscular Medicine program consists of five rotations. Goals for the competency Clinical Science/Medical Knowledge are listed by rotation and are as follows:

A.  NEUROMUSCULAR EVALUATION ROTATION (NMM Clinic)
B.  ELECTROMYOGRAPHY ROTATION (EMG Lab)
C.  MUSCLE, NERVE AND SKIN PATHOLOGY ROTATION
D.  REHABILITATION MEDICINE ROTATION
E.  NEUROMUSCULAR RESEARCH ELECTIVE ROTATION
A. NEUROMUSCULAR EVALUATION ROTATION (NMM CLINIC):

The Neuromuscular Medicine rotation is a three-month longitudinal rotation located in the Landon Center on Aging, Veterans Administration Medical Center and the University of Kansas Hospital. Fellows are involved in the evaluation and management of patients with neuromuscular disease with close faculty supervision. During this rotation the fellow is exposed to a wide variety of diseases in the outpatient and inpatient settings.

DELINEATION OF RESIDENT RESPONSIBILITIES:

1. Evaluate, present and discuss neuromuscular inpatient consultations (new and follow up) with the attending physician and enter neuromuscular consultation reports on the day of service.
2. Evaluate, present and discuss neuromuscular outpatient evaluations (new and follow up) with the attending physician and enter reports on the day of service.
3. Organize Muscle and Nerve Biopsy conferences.
4. Present EMG/neuromuscular topics.
5. Participate in Journal Club.
7. Give one case presentation per year.
8. Give one Grand Rounds per year.
9. Participate in neuromuscular lectures to neurology residents.
10. Read *Neuromuscular Disorders* by Amato and Russell. Additional reading suggestions:

    Feldman, Grisold, Russell and Zifko: *Atlas of Neuromuscular Diseases*
    Amato and Russell: *Neuromuscular Disorders*
    Engel and Franzini-Armstrong: *Myology*
    Dyck and Thomas: *Peripheral Neuropathy*
    Mendell, Kissel and Cornblath: *Diagnosis and Management of Peripheral Nerve Disorders*
    Mitsumoto, Przedborksi and Gordon: *Amyotrophic Lateral Sclerosis*
    Engel: *Myasthenia Gravis and Myasthenic Disorders*
    Dimitiur and Amato: *Electrodiagnostic Medicine*
    Brown and Bolton: *Clinical Electromyography*
    Levin and Luders: *Comprehensive Clinical Neurophysiology*
    Preston and Shapiro: *Electromyography and Neuromuscular Disorders*
    Kimura: *Electrodiagnosis in Disease of Nerve and Muscle*
    Barohn and Dimachkie: *Neurologic Clinics: Peripheral Neuropathy*
    Barohn and Dimachkie: *Neurologic Clinics: Myopathies*
    Barohn and Dimachkie: *Neurologic Clinics: Motor Neuron Disease*
    Barohn and Dimachkie: *Neurologic Clinics: Neuromuscular Junction Disorders*

**Fellowship Reading List**

1. A Manual of Techniques in Motor and Sensory Clinical Neurophysiology from the Mayo Clinic
2. A Pattern Recognition Approach to the Patient with a Suspected Myopathy by Barohn
3. A Randomized Trial Comparing Intravenous Immune Globulin and Plasm Exchange in Guillain-Barre Syndrome by van der Meche
4. Amyotrophic Lateral Sclerosis: A Historical Perspective by Katz
5. Amyotrophic Lateral Sclerosis Regional Variants (Brachial Amyotrophic Diplegia, Leg Amyotrophic Diplegia and Isolated Bulbar Amyotrophic Lateral Sclerosis) by Jawdat
6. Anatomic Guide for the Electromyography by Delagi
7. Antimyotonic Effects of Tocainide Enantiomers on Skeletal Muscle Fibers of Congenitally Myotonic Goats by Camerino
8. Autoantibody Testing in the Evaluation of Peripheral Neuropathy by Kissel
9. Axonal Multifocal Motor Neuropathy without Conduction Block or Other Features of Demyelination by Katz
10. Basic Concepts of Electricity and Electronics in Clinical Electromyography by Barry
11. Basic Electronics for Clinical Neurophysiology by Misulis
13. Carpal Tunnel Syndrome by Vriesendorp and Dimachkie
14. Cervicobrachial Involvement in Diabetic Radiculoplexopathy by Katz
15. Challenges in the Identification of Cabalamin-Deficiency Polyneuropathy by Saperstein
16. Channelopathies of Skeletal Muscle Excitability by Cannon
17. Chapter 2, Evaluation of the Patient with Myopathy
18. Chronic Cryptogenic Sensory Polyneuropathy by Wolfe
19. Chronic Inflammatory Demyelinating Polyradiculopathy by Barohn
20. Chronic Inflammatory Demyelinating Polyneuropathy by Gorson
21. Clinical Spectrum of Chronic Acquired Demyelinating Polyneuropathy by Saperstein
22. Comparison of IVIg and PLEX in Patients with Myasthenia Gravis by Barth
23. Complementary and Alternative Therapies in ALS by Bedlack
24. Congenital Myopathies and Muscular Dystrophies by Gilbreath
25. Critical Illness Myopathy and Polyneuropathy by Dimachkie
26. Cryptogenic Sensory Polyneuropathy by Pasnoor
27. Diabetic Neuropathy by Barohn
28. Diabetic Neuropathy Part I: Overview and Symmetric Phenotypes by Pasnoor
29. Diabetic Neuropathy Part II: Proximal and Asymmetric Phenotypes by Pasnoor
30. Diagnosis and Management of Peripheral Nerve Disorders: Peripheral Neuropathy Associated with HIV Infection by Barohn and Kissel
31. Differential Amplifiers and Their Limitations by Seaba
32. Distal Acquired Demyelinating Symmetric Neuropathy by Katz
33. Distal Myopathies by Dimachkie
34. Duchenne and Becker Muscular Dystrophies by Flanigan
35. Electrodagnostic Approach to Defects of Neuromuscular Transmission by Keesey
36. Electromyography Guides toward Subgroups of Mutations in Muscle Channelopathies by Fournier
37. Electromyography: Neuromuscular Transmission Studies by Oh
38. Emery-Dreifuss Muscular Dystrophies by Zacharias
39. Entrapment Neuropathies by Arnold
40. Entrapment Neuropathies – Slides by Barohn
41. Evidence of an Abnormal Intramuscular Component of Fatigue in Multiple Sclerosis by Sharma
42. Facioscapulohumeral Dystrophy by Kissel
43. Facioscapulohumeral Muscular Dystrophy by Statland
44. Familial ALS by Boylan
45. Frontotemporal Dysfunction and Dementia in Amyotrophic Lateral Sclerosis by Woolley
46. Fundamentals of EMG – Fifth Annual Continuing Education Course, AANEM
47. Georgia Nerve Conduction Studies – A Manual for EMG Technicians by Crout
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<td>48.</td>
<td>Guillain-Barre Syndrome and Variants by Dimachkie</td>
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<td>49.</td>
<td>Idiopathic Inflammatory Myopathies by Dimachkie</td>
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<td>50.</td>
<td>Immunosuppressive Drug Therapy in Neuromuscular Disease by Saperstein</td>
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<td>51.</td>
<td>Inclusion Body Myositis by Dimachkie</td>
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<td>52.</td>
<td>Inherited Peripheral Neuropathies by Saporta</td>
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<td>53.</td>
<td>Intravenous Immune Globulin (10% Caprylate-Chromatography Purified) for the Treatment of Chronic Inflammatory Demyelinating Polyradiculoneuropathy (ICE Study): A Randomized Placebo-Controlled Trial by Hughes</td>
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<td>54.</td>
<td>Isolated Neck Extensor Myopathy: A Common Cause of Dropped Head Syndrome by Katz</td>
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<td>55.</td>
<td>IV Immunoglobulin in Patients with Myasthenia Gravis: A Randomized Controlled Trial by Zinman</td>
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<td>56.</td>
<td>Neuropathy Associated with Nutritional and Vitamin Deficiencies – Polyneuropathy Caused by Nutritional and Vitamin Deficiency by Saperstein</td>
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<td>57.</td>
<td>Laboratory Evaluation of Peripheral Neuropathy by Levine</td>
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<td>58.</td>
<td>Lambert-Eaton Myasthenic Syndrome by Newsom-Davis</td>
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<td>Management of Myasthenia Gravis by Saperstein</td>
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<td>61.</td>
<td>Meetings Abstracts – 28th Annual Carrell-Krusen Symposium</td>
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<td>Metabolic and Mitochondrial Myopathies by Sharp</td>
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<td>Multifocal Acquired Demyelinating Sensory and Motor Neuropathy – The Lewis-Summer Syndrome by Saperstein</td>
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<td>Multifocal Motor Neuropathy, Multifocal Acquired Demyelinating Sensory and Motor Neuropathy and Other Chronic Acquired Demyelinating Polyneuropathy Variants by Dimachkie</td>
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<td>65.</td>
<td>Muscle Biopsy – A Modern Approach by Dubowitz and Brooks – Part I and II</td>
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<td>Muscle Channelopathies by Statland</td>
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<td>Myasthenia Gravis by Saperstein</td>
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<td>Myasthenia Gravis from Clinical News MGFA</td>
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<td>69.</td>
<td>Myopathies by Dimachkie</td>
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<td>Myotonic Dystrophy by Thornton</td>
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<td>NCS Techniques</td>
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<td>72.</td>
<td>Nerve Conduction Studies in Infants and Children by Milled</td>
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<td>73.</td>
<td>Neuropathies Associated with Connective Tissue Disease by Olney</td>
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<td>74.</td>
<td>Neuropathies Associate with Malignancy by Amato</td>
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<tr>
<td>75.</td>
<td>Neuropathology of Amyotrophic Lateral Sclerosis and Its Variants by Saberi</td>
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<td>76.</td>
<td>New Potent Mexiteline and Tocainide Anallogues Evaluated in vivo and in vitro as Antimyotonic Agents on the Myotonic ADR Mouse by De Luca</td>
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<td>77.</td>
<td>Nucleoside Analogue Neuropathies by Dimachkie</td>
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<td>Nutritional Neuropathies by Hammond</td>
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<td>79.</td>
<td>Paramyotonia Congenita – Abnormal Short Exercise Test and Improvement after Mexiteline Therapy by Jackson</td>
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<td>80.</td>
<td>Paraproteinemic Neuropathy by Wicklund</td>
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<td>81.</td>
<td>Patterns of Weakness, Classification of Motor Neuron Disease and Clinical Diagnosis of Sporadic Amyotrophic Lateral Sclerosis by Statland</td>
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<td>83.</td>
<td>Peripheral Neuropathy Due to Leprosy by Nations</td>
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<td>84.</td>
<td>Plasmapheresis and Acute Guillian-Barre Syndrome</td>
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<td>85.</td>
<td>Polyneuropathy Associated with Anti-MAG IgM Antibodies by Dimachkie</td>
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<td>86.</td>
<td>Pompe Disease: Literature Review and Case Series by Dasouki</td>
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87. Post-Radiation Lower Motor Neuron Syndrome by Sluis
88. Potential Environment Factors in Amyotrophic Lateral Sclerosis by Oskarsson
90. Primary Lateral Sclerosis by Statland
91. Primary Lateral Sclerosis: Clinical and Laboratory Features in 25 Patients by Singer
92. Progressive Muscular Atrophy by Liewluch
93. Radial Neuropathy by Dimachkie
94. Randomized Trial of Plasma Exchange, Intravenous Immunoglobulin and Combined Treatments in Guillain-Barre Syndrome by Hughes
95. Research Criteria for Diagnosis of Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)
96. Safety and Efficacy of Recombinant Acid Alpha-Glucosidase (rhGAA) in Patients with Classical Infantile Pompe Disease – Results of a Phase II Clinical Trial by Klinge
97. Single-Fiber Electromyography by Sanders
98. Spinal and Bulbar Muscular Atrophy by Grunseich
99. Spinal Muscular Atrophy by Kolb
100. Spinal Muscular Atrophy by Iannaccone
101. Standards of Measurements in Myasthenia Gravis by Barohn
102. Supportive Care for Patients with Guillain-Barre Syndrome by Hughes
103. Symptom Management and End-of-Life Care in Amyotrophic Lateral Sclerosis by Jackson
104. The Burns-Garland Syndrome (Diabetic Amyotrophy) by Barohn
105. The Effect of Temperature in Neuromuscular Electrophysiology by Rutkove
106. The Electrodiagnosis of Carpal Tunnel Syndrome by Stevens
107. The Electrodiagnosis of Ulnar Neuropathy at the Elbow by Kincaid
108. The Electrodiagnostic Examination in Patients with Radiculopathies by Wilbourn
109. The Exercise Test in Periodic Paralysis by McManis
110. The Limb-Girdle Muscular Dystrophies by Wicklund
111. The Neuropathies of Vasculitis by Collins
112. The Treatment of Myotonia – A Controlled Clinical Trial by Leyburn
113. The Use of Ultrasound in Neuromuscular Diagnoses by Hommel
114. The Dilemma of the Clinical Trialist in Amyotrophic Lateral Sclerosis: The Hurdles to Finding a Cure
115. Tibial Nerve Injuries by Dimachkie
116. Toxic Myopathies by Pasnoor
117. Treatment of Painful Peripheral Neuropathy by Trivedi
118. Ulnar Neuropathy at the Elbow by Dimachkie
119. Update on the Evaluation and Therapy of Neuromuscular Junction Disorders by Katz

At the beginning of the academic year, fellows are provided with a flash-drive containing an extensive list of published references on a variety of neuromuscular diseases

Additional Resources for online exams/SAE, free for AANEM members:
AANEM Training Program Partnership (TPP)
https://www.aanem.org/Membership/Join-AANEM/Training-Program-Partnership
Your registration has been paid for by the department. Includes complementary AANEM membership with the Muscle & Nerve journal, knowledge assessment questions, cases, case studies, oral cases, etc.
I. Clinical Science/Medical Knowledge

Goal: Fellows must demonstrate knowledge about established and evolving neuroscience that would be critical to the practice of Neuromuscular Medicine in the inpatient and outpatient settings. This includes initiation of and participation in research projects. The locations include the Landon Center on Aging and the Kansas City VAMC.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. The theoretical basis for clinical interventions used in Neuromuscular Medicine
2. Major disorders, including:
   a) the epidemiology of the disorders
   b) the etiology of the disorder, including contributing medical, genetic and social factors
   c) the phenomenology of the disorder
   d) diagnostic criteria
   e) appropriate evaluation
   f) course and prognosis
   g) effective treatment strategies
3. Pathophysiology of major Neuromuscular Medicine disorders and familiarity with the scientific basis of neurologic diseases, including:
   a) neuroanatomy
   b) neuropathology
   c) neurochemistry
   d) neurophysiology
   e) neuropharmacology
   f) neuroimmunology/neurovirology
   g) neurogenetics/molecular neurology and neuroepidemiology
   h) neuroimaging
   i) neuro-ophthalmology
   j) neuro-otology
   k) cerebrospinal fluid
   l) neurological rehabilitation
   m) issues related to neuromuscular disorders
4. Gross and microscopic specimens taken from the normal nervous system and from patients with major neuromuscular disorders
Objectives/Skills – Fellows will demonstrate ability to:

1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
   i) neuromuscular examination

2. Create differential diagnoses:
   a) to determine if a patient’s symptoms are the result of a disease affecting the central and/or peripheral nervous system or are of another origin
   b) to make a formulation, laboratory investigation, and cost-effective management plan

3. To develop and maintain the technical skills to:
   a) perform edrophonium testing
   b) identify and describe abnormalities seen in common neuromuscular disorders on radiographic testing including plain film, myelography, angiography, CT, isotope and MRI
   c) evaluate the application and relevance of investigative procedures and interpretation in the diagnosis of neurologic disease, including the following:
      i. electroencephalogram
      ii. motor and sensory nerve conduction studies
      iii. electromyography
      iv. evoked potentials
      v. polysomnography
      vi. electronystagmogram
      vii. audiometry
      viii. perimetry
      ix. psychometry
      x. CSF analysis
      xi. vascular imaging (Duplex, transcranial Doppler)
      xii. radiographic studies as outlined above
      xiii. d) identify and describe gross and microscopic specimens taken from the normal nervous system and from patients with major neuromuscular disorders

4. To recognize and treat major neuromuscular disorders

Objective/Attitudes – Fellows must maintain and apply an investigatory and analytic thinking approach to clinical situations

Demonstrated by:
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning
**Evaluation:**
Fellow evaluation
Formal and informal observation

**Remediation:**
The program director will semi-annually review the fellow’s performance and will:

1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**II. Patient Care**

**Goal:** Fellows must be able to provide patient care that is compassionate, appropriate and effective for the treatment of neurological problems

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:

1. The lesion localization and differential diagnosis in neuromuscular disorders
2. Investigational plan
3. Interpretation of NCS, EMG and muscle, nerve and skin biopsies
4. Available treatment methods for the major neuromuscular medicine disorders and the evidence which supports their use
5. Preventive interventions used in neuromuscular medicine

**Objectives/Skills** – Fellows will demonstrate the ability to:

1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
2. Create differential diagnoses
3. Evaluate, assess and recommend cost-effective management of patients
4. Recognize and treat neuromuscular medicine disorders
5. Apply the use of electrical, tissue pathological and mechanical methods in the evaluation and treatment of a wide range of diseases

**Objectives/Attitudes** – Fellows will:

1. Be strong advocates for the patient’s best interests
2. Strive to provide quality care within available resources
3. Be sensitive to patient’s cultural differences
4. Be sensitive to confidentiality and consent issues
Demonstrated by:
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning; direct observation by faculty during clinics and on clinic rotations; case conferences; chart review with supervisors

Evaluation:
Supervision and rotation evaluations
Formal and informal observations

Remediation:
The program director will regularly review the fellow’s performance and will:

1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

III. Interpersonal and Communication Skills

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to develop and maintain appropriate interpersonal relationships and to communicate effectively with patients, families, colleagues and the public.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Interviewing techniques
2. Communication techniques

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties. This shall include:
   a) knowing when to solicit consultation and having sensitivity to assess the need for consultation
   b) discussing consultation findings with patients and their families
   c) evaluating the consultation findings
2. Serve as an effective consultant to other medical specialists and community agencies. This shall include:
   a) communicating effectively with the requesting party to refine the consultation question
   b) maintain the role of consultant
   c) communicate clear and specific recommendations
   d) respect the knowledge and expertise of the requesting party
3. Demonstrate the ability to communicate effectively with patients and their families by:
   a) gearing all communication to the educational/intellectual levels of patients and their families
   b) providing explanations of neuromuscular medicine disorders and treatment (both verbally and in written form) that are jargon-free and geared to the educational/intellectual level of patients and their families
   c) providing preventive education that is understandable and practical as well as applicable
d) respecting the patient’s cultural, ethnic and economic background
e) developing and enhancing rapport and a working alliance with patients and their families

4. Maintain medical records and written prescriptions that are legible and up-to-date. These records must capture essential information while simultaneously respecting patient privacy and be useful to health professionals outside neuromuscular medicine
   1. recognize the need for, and effectively use, interpreters when necessary
   2. give one Grand Rounds per year and/or present at a national or regional meeting
   3. provide feedback to students, residents and other professionals

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of respect for others, even those with differing points of view
2. Exhibit culturally sensitive, professional, ethically sound behavior in all patient and professional interactions
3. Maintain an attitude of interdisciplinary collaboration
4. Maintain a polite and courteous attitude at all times

Demonstrated by:
Chart documentation; direct observation; teaching others; professional relationships; formal presentations; independent learning; seeking feedback on communication and performance

Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

IV. Practice Based Learning and Improvement

Goal: Fellows will demonstrate knowledge, skills and attitudes necessary to initiate self-directed and independent learning. Fellows must keep abreast of current information and practices relevant to neuromuscular medicine.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Research methodology, including critical assessment of professional journal articles
2. Principles of evidence-based medicine
3. Awareness of available information technologies and the ability to assess them

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate up-to-date information from the scientific and practice literature to assist in the quality of care of patients. This shall include:
   a) use of medical libraries
b) use of information technology, including internet-based searches and literature databases (e.g., Medline)

c) use of drug information databases

d) active participation, as appropriate, in educational courses, conferences and other organized educational activities both at the local and national levels

e) conducting and presenting reviews of current research in such formats as journal clubs, Grand Rounds and/or original publications

f) participation in funded research projects

2. Assess the generalizability or applicability of research findings to patients in relation to their socio-demographic and clinical characteristics. The physician shall demonstrate the ability to critically evaluate the relevant medical literature

3. Evaluate the caseload and practice experience in a systematic manner. This may include:

a) case-based learning

b) the review of patient records and outcomes

c) obtaining appropriate supervision and consultation

d) maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors

Objectives/Attitudes – Fellows will:

1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning

2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:

1. Identify any specific deficits

2. Document all areas requiring remediation or additional concentration

3. Provide additional recommendations for remediation of specific deficiencies

V. Professionalism and Ethical Behavior

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to practice professionally responsible, ethical and compassionate care in neuromuscular medicine

Objectives/Knowledge – Fellows will demonstrate knowledge of:

1. The impact of gender, culture, religion, socioeconomic factors, and family structures and systems on issues pertaining to neuromuscular medicine

2. The different roles a neuromuscular specialist might fulfill in different settings
3. Legal issues relevant to neuromuscular medicine
4. Ethical issues in neuromuscular medicine. This includes knowledge of the American Academy of Neurology Code of Ethics
5. Ethical issues important in conducting research with humans and the role of the Committee for Protection of Human Subjects

**Objectives/Skills** – Fellows will be able to:

1. Respond to communications from patients and health professionals in a timely manner. If unavailable, the physician shall establish and communicate back-up arrangements
2. Use medical records for appropriate documentation of the course of illness and its treatment
3. Provide continuity of care including appropriate consultation, transfer or termination of patients (clinic rotation)
4. Demonstrate ethical behavior, integrity, honesty, professional conduct, compassion and confidentiality in the delivery of patient care, including obtaining informed consent/assent, and declaring conflict of interest
5. Demonstrate respect for patients and colleagues as individuals by showing sensitivity to their age, culture, disabilities, ethnicity, gender, socioeconomic background, religious beliefs, political affiliations, and sexual orientation
6. Demonstrate appreciation of end-of-life care and issues regarding provision for or withholding of care
7. Acknowledge responsibility for his or her decisions and demonstrate commitment to the review and remediation of his or her professional conduct
8. Promote the highest standards of medical healthcare to the public and participate in the review of the professional conduct of his or her colleagues

**Objectives/Attitudes** – Fellows will:

1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

**Demonstrated by:**
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

**Evaluation:**
Rotation evaluation
Regular review by the program director

**Remediation:**
The program director will regularly review the fellow’s performance and will:

1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies
VI. Systems Based Practice

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to effectively in multiple, diverse, complex systems of care to provide effective treatment, consultations and referrals for patients.

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. Basic concepts of systems theory
2. How patient care practices of fellows and residents and related actions impact component units of health care delivery
3. Systems-based approaches for controlling health care costs and allocating resources

**Objectives/Skills** – Fellows will be able to:
1. Advocate for patients within a variety of systems
2. Partner with insurance and managed care companies to meet patient needs
3. Strive to practice cost-effective health care and resource allocation that does not compromise the quality of care

**Objectives/Attitudes** – Fellows will:
1. Maintain an attitude of interdisciplinary collaboration, advocacy and cooperation
2. Maintain flexibility in adapting to the needs and expectations of different settings and systems
3. Maintain the patient’s best interests as the top priority

**Demonstrated by:**
Care of patients; interactions with other agencies involved in the care of patients; consultation with other professionals; participation in Quality Assurance, Utilization Review and Performance Improvement committees; self-directed independent learning; teaching others

**Evaluation:**
Rotation evaluation
Regular review by the program director

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies
B. ELECTROMYOGRAPHY ROTATION (EMG LAB):

The Electromyography rotation is a three-month longitudinal rotation located in the Landon Center on Aging and the Kansas City VAMC. Fellows are involved in the supervised performance and interpretation of inpatient and outpatient electromyography, nerve conduction studies, single fiber EMG, IOM and autonomic nervous system testing with close faculty supervision.

DELINEATION OF RESIDENT RESPONSIBILITIES:

1. Plan the type NCS/EMG studies and perform NCS and EMG in the lab with incremental proficiency and independence
2. Discuss with the attending physician the findings and interpretation of NCS/EMG considering clinical presentation
3. Type reports on the same day or following day for attending physician review and edits. Learn from the attending feedback / edits.
4. Organize Muscle and Nerve Biopsy Conferences
5. Present EMG/neuromuscular topics
6. Participate in Journal Club
7. Prepare for participation in the Carrell-Krusen Neuromuscular Disease Symposium
8. Participate in EMG lectures and nerve conduction studies to neurology residents
9. Read *Comprehensive Clinical Neurophysiology* by Levin and Luders and *Neuromuscular Disorders* by Amato and Russell
10. Reading suggestions:

   Engel and Franzini-Armstrong: *Myology*
   Dyck and Thomas: *Peripheral Neuropathy*
   Mendell, Kissel and Cornblath: *Diagnosis and Management of Nerve Disorders*
   Mitsumoto, Przdebski, and Gordon: *Amyotrophic Lateral Sclerosis*
   Engel: *Myasthenia Gravis and Myasthenic Disorders*
   Dumitiur and Amato: *Electrodiagnostic Medicine*
   Brown and Bolton: *Clinical Electromyography*
   Levin and Luders: *Comprehensive Clinical Neurophysiology*
   Preston and Shapiro: *Electromyography and Neuromuscular Disorders*
   Kimura: *Electrodiagnosis in Disease of Nerve and Muscle*

At the beginning of the academic year fellows are provided with a flash drive containing an extensive list of published references on a variety of neuromuscular diseases

I. Clinical Science/Medical Knowledge

**Goal:** Fellows must demonstrate knowledge about established and evolving neuroscience that would be critical to the practice of electromyography and nerve conduction studies as well as autonomic nervous system testing in the inpatient and outpatient settings.

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. The theoretical basis for clinical interventions used in electromyography and nerve
2. **Major disorders, including:**
   a) the epidemiology of the disorders
   b) the etiology of the disorder, including contributing medical, genetic and social factors
   c) the phenomenology of the disorder
   d) diagnostic criteria
   e) appropriate evaluation
   f) course and prognosis
   g) effective treatment strategies

3. **Pathophysiology of major Neuromuscular Medicine disorders and familiarity with the scientific basis of neurologic diseases, including:**
   a) neuroanatomy
   b) neuropathology
   c) neurochemistry
   d) neurophysiology
   e) neuropharmacology
   f) neuroimmunology/neurovirology
   g) neurogenetics/molecular neurology and neuroepidemiology
   h) neuroimaging
   i) neuro-ophthalmology
   j) neuro-otology
   k) cerebrospinal fluid
   l) neurological rehabilitation
   m) issues related to neuromuscular disorders

4. **Gross and microscopic specimens taken from the normal nervous system and from patients with major neuromuscular disorders**

**Objectives/Skills** – Fellows will demonstrate ability to:

1. Use common devices to perform good quality:
   a) nerve conduction studies
   b) electromyography

2. Perform:
   a) an abbreviated history and physical exam within 5 to 10 minutes in order to develop a plan for the nerve conduction studies
   b) nerve conduction studies in 10 to 30 minutes per limb, assisted by a technologist and progressing to independence as determined by the faculty evaluations
   c) needle exams of appropriate muscles in 10 to 30 minutes per limb with attending supervision and progressive independence based on the level of skill as evidenced from the faculty evaluations

3. To assess major disorders including disorders of anterior horn cell, root, plexus, nerve, neuromuscular junction and muscle

4. To use electrophysiological methods in the evaluation and treatment of a wide range of diseases

**Objective/Attitudes** – Fellows must maintain and apply an investigatory and analytic thinking approach to clinical situations
**Demonstrated by:**
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning

**Evaluation:**
Fellow evaluation
Formal and informal observation

**Remediation:**
The program director will semi-annually review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**II. Patient Care**

**Goal:** Fellows must be able to provide patient care that is compassionate, appropriate and effective for the treatment of neurological problems

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. The lesion localization and differential diagnosis in neuromuscular disorders
2. Investigational plan
3. Interpretation of NCS, EMG and muscle, nerve and skin biopsies
4. Available treatment methods for the major neuromuscular medicine disorders and the evidence which supports their use
5. Preventive interventions used in neuromuscular medicine

**Objectives/Skills** – Fellows will demonstrate the ability to:
1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
2. Create differential diagnoses
3. Evaluate, assess and recommend cost-effective management of patients
4. Recognize and treat neuromuscular medicine disorders
5. Apply the use of electrical, tissue pathological and mechanical methods in the evaluation and treatment of a wide range of diseases

**Objectives/Attitudes** – Fellows will:
1. Be strong advocates for the patient’s best interests
2. Strive to provide quality care within available resources
3. Be sensitive to patient’s cultural differences
4. Be sensitive to confidentiality and consent issues

**Demonstrated by:**
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning; direct observation by faculty during clinics and on clinic rotations; case conferences; chart review with supervisors

**Evaluation:**
Supervision and rotation evaluations
Formal and informal observations

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**III. Interpersonal and Communication Skills**

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to develop and maintain appropriate interpersonal relationships and to communicate effectively with patients, families, colleagues and the public.

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. Interviewing techniques
2. Communication techniques

**Objectives/Skills** – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties. This shall include:
   a) knowing when to solicit consultation and having sensitivity to assess the need for consultation
   b) discussing consultation findings with patients and their families
   c) evaluating the consultation findings

2. Serve as an effective consultant to other medical specialists and community agencies. This shall include:
   a) communicating effectively with the requesting party to refine the consultation question
   b) maintain the role of consultant
   c) communicate clear and specific recommendations
   d) respect the knowledge and expertise of the requesting party
3. Demonstrate the ability to communicate effectively with patients and their families by:
   a) gearing all communication to the educational/intellectual levels of patients and their families
b) providing explanations of neuromuscular medicine disorders and treatment (both verbally and in written form) that are jargon-free and geared to the educational/intellectual level of patients and their families
c) providing preventive education that is understandable and practical as well as applicable
d) respecting the patient’s cultural, ethnic and economic background
e) developing and enhancing rapport and a working alliance with patients and their families

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of respect for others, even those with differing points of view
2. Exhibit culturally sensitive, professional, ethically sound behavior in all patient and professional interactions
3. Maintain an attitude of interdisciplinary collaboration
4. Maintain a polite and courteous attitude at all times

Demonstrated by:
Chart documentation; direct observation; teaching others; professional relationships; formal presentations; independent learning; seeking feedback on communication and performance

Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

IV. Practice Based Learning and Improvement

Goal: Fellows will demonstrate knowledge, skills and attitudes necessary to initiate self-directed and independent learning. Fellows must keep abreast of current information and practices relevant to neuromuscular medicine.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Research methodology, including critical assessment of professional journal articles
2. Principles of evidence-based medicine
3. Awareness of available information technologies and the ability to assess them

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate up-to-date information from the scientific and practice literature to assist in the quality of care of patients. This shall include:
   a) use of medical libraries
   b) use of information technology, including internet-based searches and literature databases (e.g., Medline)
c) use of drug information databases
d) active participation, as appropriate, in educational courses, conferences and other organized educational activities both at the local and national levels
e) conducting and presenting reviews of current research in such formats as journal clubs, Grand Rounds and/or original publications
f) participation in funded research projects

2. Assess the generalizability or applicability of research findings to patients in relation to their socio-demographic and clinical characteristics. The physician shall demonstrate the ability to critically evaluate the relevant medical literature

3. Evaluate the caseload and practice experience in a systematic manner. This may include:
   a) case-based learning
   b) the review of patient records and outcomes
   c) obtaining appropriate supervision and consultation
   d) maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

V. Professional and Ethical Behavior

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to practice professionally responsible, ethical and compassionate care in neuromuscular medicine

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. The impact of gender, culture, religion, socioeconomic factors, and family structures and systems on issues pertaining to neuromuscular medicine
2. The different roles a neuromuscular specialist might fulfill in different settings
3. Legal issues relevant to neuromuscular medicine
4. Ethical issues in neuromuscular medicine. This includes knowledge of the American Academy of Neurology Code of Ethics
5. Ethical issues important in conducting research with humans and the role of the Committee for Protection of Human Subjects

**Objectives/Skills** – Fellows will be able to:
1. Respond to communications from patients and health professionals in a timely manner. If unavailable, the physician shall establish and communicate back-up arrangements
2. Use medical records for appropriate documentation of the course of illness and its treatment
3. Provide continuity of care including appropriate consultation, transfer or termination of patients (clinic rotation)
4. Demonstrate ethical behavior, integrity, honesty, professional conduct, compassion and confidentiality in the delivery of patient care, including obtaining informed consent/assent, and declaring conflict of interest
5. Demonstrate respect for patients and colleagues as individuals by showing sensitivity to their age, culture, disabilities, ethnicity, gender, socioeconomic background, religious beliefs, political affiliations, and sexual orientation
6. Demonstrate appreciation of end-of-life care and issues regarding provision for or withholding of care
7. Acknowledge responsibility for his or her decisions and demonstrate commitment to the review and remediation of his or her professional conduct
8. Promote the highest standards of medical healthcare to the public and participate in the review of the professional conduct of his or her colleagues

**Objectives/Attitudes** – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

**Demonstrated by:**
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

**Evaluation:**
Rotation evaluation
Regular review by the program director

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**VI. Systems Based Practice**

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to effectively in multiple, diverse, complex systems of care to provide effective treatment, consultations and referrals for patients.
Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Basic concepts of systems theory
2. How patient care practices of fellows and residents and related actions impact component units of health care delivery
3. Systems-based approaches for controlling health care costs and allocating resources

Objectives/Skills – Fellows will be able to:
1. Advocate for patients within a variety of systems
2. Partner with insurance and managed care companies to meet patient needs
3. Strive to practice cost-effective health care and resource allocation that does not compromise the quality of care

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of interdisciplinary collaboration, advocacy and cooperation
2. Maintain flexibility in adapting to the needs and expectations of different settings and systems
3. Maintain the patient’s best interests as the top priority

Demonstrated by:
Care of patients; interactions with other agencies involved in the care of patients; consultation with other professionals; participation in Quality Assurance, Utilization Review and Performance Improvement committees; self-directed independent learning; teaching others

Evaluation:
Rotation evaluation
Regular review by the program director

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies
C. MUSCLE, NERVE AND SKIN PATHOLOGY ROTATION:

The Muscle, Nerve and Skin Pathology rotation is a two-month longitudinal rotation located in the Landon Center on Aging and Support Services Building. Fellows are involved in the performance and interpretation of tissue biopsies with close faculty supervision. During this rotation, each fellow is expected to demonstrate knowledge critical to this rotation. This rotation is longitudinal on all Wednesday mornings and Friday mornings or afternoons.

DELINEATION OF RESIDENT RESPONSIBILITIES:

1. Perform muscle and nerve biopsies with faculty supervision
2. Pre-read and discuss with the supervising attending physician the biopsy findings and interpretation, and draft pathology reports within 2-10 days from the biopsy day of service considering the clinical presentation for faculty review
3. Present findings at the Biopsy conference to neuromuscular faculty for feedback and Discussion with 14 to 28 days of biopsy performance
4. Enter report into EMR within 2 to 4 weeks from date of biopsy service following attending physician and NM team review
5. Read the following:
   a) first three chapters in Amato and Russell, Neuromuscular Disorders
   b) first five chapters in Oh, Color Atlas of Nerve Biopsy Pathology
   c) all of Brumback and Leech, Color Atlas of Muscle Histochemistry
6. Present EMG/neuromuscular topics
7. Participate in Journal Club
8. Prepare for participation in the Carrell-Krusen Neuromuscular Symposium
9. Participate in lectures in EMG and nerve conduction studies to neurology residents
10. Additional suggested reading:

   Carpenter and Karpati: Pathology of Skeletal Muscle
At the beginning of the academic year, fellows are provided with a flash-drive containing an extensive list of published references on a variety of neuromuscular diseases

I. Clinical Science/Medical Knowledge

**Goal:** Fellows must demonstrate knowledge about established and evolving neuroscience that would be critical to the practice of muscle, nerve and skin biopsy

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:

1. The theoretical basis for processing and evaluating muscle, nerve and skin tissues based on comprehensive understanding of basic tissue reactions to a wide variety of neuromuscular disorders

2. Major disorders, including:
   a) the epidemiology of the disorders
   b) the etiology of the disorder, including contributing medical, genetic and social factors
   c) the phenomenology of the disorder
   d) diagnostic criteria
   e) appropriate evaluation
   f) course and prognosis
   g) effective treatment strategies

3. Pathophysiology of major Neuromuscular Medicine disorders and familiarity with the scientific basis of neurologic diseases, including:
   a) neuroanatomy
   b) neuropathology
   c) neurochemistry
   d) neurophysiology
   e) neuropharmacology
   f) neuroimmunology/neurovirology
   g) neurogenetics/molecular neurology and neuroepidemiology
   h) neuroimaging
   i) neuro-ophthalmology
   j) neuro-otology
   k) cerebrospinal fluid
l) neurological rehabilitation
m) issues related to neuromuscular disorders

4. Gross and microscopic specimens taken from the normal nervous system and from patients with major neuromuscular disorders

Objectives/Skills – Fellows will demonstrate ability to:
1. Use common devices to perform good quality:
   a) muscle, nerve and skin biopsies
   b) tissue preparation, preservation and processing
   c) tissue histopathologic, enzymatic and immunologic studies
2. Perform:
   a) an abbreviated history and physical exam
   b) an interpretation of the tissue pathologic alterations within 24 hours of the biopsy
   c) review the tissue within 48 hours of the biopsy with the neuromuscular specialist
3. To assess major disorders including disorders of anterior horn cell, root, plexus, nerve, neuromuscular junction and muscle
4. To use electrophysiologic methods in the evaluation and treatment of a wide range of diseases

Objective/Attitudes – Fellows must maintain and apply an investigatory and analytic thinking approach to clinical situations

Demonstrated by:
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning

Evaluation:
Fellow evaluation
Formal and informal observation

Remediation:
The program director will semi-annually review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

II. Patient Care

Goal: Fellows must be able to provide patient care that is compassionate, appropriate and effective for the treatment of neurological problems

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. The lesion localization and differential diagnosis in neuromuscular disorders
2. Investigational plan
3. Interpretation of NCS, EMG and muscle, nerve and skin biopsies
Available treatment methods for the major neuromuscular medicine disorders and the evidence which supports their use

Preventive interventions used in neuromuscular medicine

**Objectives/Skills** – Fellows will demonstrate the ability to:

1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status

2. Create differential diagnoses
3. Evaluate, assess and recommend cost-effective management of patients
4. Recognize and treat neuromuscular medicine disorders
5. Apply the use of electrical, tissue pathological and mechanical methods in the evaluation and treatment of a wide range of diseases

**Objectives/Attitudes** – Fellows will:

1. Be strong advocates for the patient’s best interests
2. Strive to provide quality care within available resources
3. Be sensitive to patient’s cultural differences
4. Be sensitive to confidentiality and consent issues

**Demonstrated by:**
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning; direct observation by faculty during clinics and on clinic rotations; case conferences; chart review with supervisors

**Evaluation:**
Supervision and rotation evaluations
Formal and informal observations

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**III. Interpersonal and Communication Skills**

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to develop and maintain appropriate interpersonal relationships and to communicate effectively with patients, families, colleagues and the public.
Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Interviewing techniques
2. Communication techniques

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties. This shall include:
   a) knowing when to solicit consultation and having sensitivity to assess the need for consultation
   b) discussing consultation findings with patients and their families
   c) evaluating the consultation findings
2. Serve as an effective consultant to other medical specialists and community agencies. This shall include:
   a) communicating effectively with the requesting party to refine the consultation question
   b) maintain the role of consultant
   c) communicate clear and specific recommendations
   d) respect the knowledge and expertise of the requesting party
3. Demonstrate the ability to communicate effectively with patients and their families by:
   a) gearing all communication to the educational/intellectual levels of patients and their families
   b) providing explanations of neuromuscular medicine disorders and treatment (both verbally and in written form) that are jargon-free and geared to the educational/intellectual level of patients and their families
   c) providing preventive education that is understandable and practical as well as applicable
   d) respecting the patient’s cultural, ethnic and economic background
   e) developing and enhancing rapport and a working alliance with patients and their families
4. Maintain medical records and written prescriptions that are legible and up-to-date. These records must capture essential information while simultaneously respecting patient privacy and be useful to health professionals outside neuromuscular medicine

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of respect for others, even those with differing points of view
2. Exhibit culturally sensitive, professional, ethically sound behavior in all patient and professional interactions
3. Maintain an attitude of interdisciplinary collaboration
4. Maintain a polite and courteous attitude at all times

Demonstrated by:
Chart documentation; direct observation; teaching others; professional relationships; formal presentations; independent learning; seeking feedback on communication and performance

Evaluation:
Direct observation
Rotation evaluation
Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

IV. Practice Based Learning and Improvement

Goal: Fellows will demonstrate knowledge, skills and attitudes necessary to initiate self-directed and independent learning. Fellows must keep abreast of current information and practices relevant to neuromuscular medicine.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Research methodology, including critical assessment of professional journal articles
2. Principles of evidence-based medicine
3. Awareness of available information technologies and the ability to assess them

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate up-to-date information from the scientific and practice literature to assist in the quality of care of patients. This shall include:
   a) use of medical libraries
   b) use of information technology, including internet-based searches and literature databases (e.g., Medline)
   c) use of drug information databases
   d) active participation, as appropriate, in educational courses, conferences and other organized educational activities both at the local and national levels
   e) conducting and presenting reviews of current research in such formats as journal clubs, Grand Rounds and/or original publications
   f) participation in funded research projects
2. Assess the generalizability or applicability of research findings to patients in relation to their socio-demographic and clinical characteristics. The physician shall demonstrate the ability to critically evaluate the relevant medical literature
3. Evaluate the caseload and practice experience in a systematic manner. This may include:
   a) case-based learning
   b) the review of patient records and outcomes
   c) obtaining appropriate supervision and consultation
   d) maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others
Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

V. Professionalism and Ethical Behavior

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to practice professionally responsible, ethical and compassionate care in neuromuscular medicine

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. The impact of gender, culture, religion, socioeconomic factors, and family structures and systems on issues pertaining to neuromuscular medicine
2. The different roles a neuromuscular specialist might fulfill in different settings
3. Legal issues relevant to neuromuscular medicine
4. Ethical issues in neuromuscular medicine. This includes knowledge of the American Academy of Neurology Code of Ethics
5. Ethical issues important in conducting research with humans and the role of the Committee for Protection of Human Subjects

Objectives/Skills – Fellows will be able to:
1. Respond to communications from patients and health professionals in a timely manner. If unavailable, the physician shall establish and communicate back-up arrangements
2. Use medical records for appropriate documentation of the course of illness and its treatment
3. Provide continuity of care including appropriate consultation, transfer or termination of patients (clinic rotation)
4. Demonstrate ethical behavior, integrity, honesty, professional conduct, compassion and confidentiality in the delivery of patient care, including obtaining informed consent/assent, and declaring conflict of interest
5. Demonstrate respect for patients and colleagues as individuals by showing sensitivity to their age, culture, disabilities, ethnicity, gender, socioeconomic background, religious beliefs, political affiliations, and sexual orientation
6. Demonstrate appreciation of end-of-life care and issues regarding provision for or withholding of care
7. Acknowledge responsibility for his or her decisions and demonstrate commitment to the review and remediation of his or her professional conduct
8. Promote the highest standards of medical healthcare to the public and participate in the review of the professional conduct of his or her colleagues

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

Evaluation:
Rotation evaluation
Regular review by the program director

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

VI. Systems Based Practice

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to effectively in multiple, diverse, complex systems of care to provide effective treatment, consultations and referrals for patients.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Basic concepts of systems theory
2. How patient care practices of fellows and residents and related actions impact component units of health care delivery
3. Systems-based approaches for controlling health care costs and allocating resources

Objectives/Skills – Fellows will be able to:
1. Advocate for patients within a variety of systems
2. Partner with insurance and managed care companies to meet patient needs
3. Strive to practice cost-effective health care and resource allocation that does not compromise the quality of care

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of interdisciplinary collaboration, advocacy and cooperation
2. Maintain flexibility in adapting to the needs and expectations of different settings and systems
3. Maintain the patient’s best interests as the top priority

Demonstrated by:
Care of patients; interactions with other agencies involved in the care of patients; consultation with other professionals; participation in Quality Assurance, Utilization Review and Performance Improvement committees; self-directed independent learning; teaching others
**Evaluation:**
Rotation evaluation
Regular review by the program director

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies
The Rehabilitation Medicine rotation is integrated in the two-month longitudinal exposure throughout neuromuscular rotations 1 and 3 at the Landon Center on Aging. Fellows work in conjunction with the physical therapists, occupational therapists, speech therapists, respiratory therapists, nutritionists, a seating clinic specialist, a respiratory health care representative, and a social worker from the multidisciplinary ALS Association and MDA clinics. This is on a weekly basis and with close faculty supervision.

**DELINEATION OF RESIDENT RESPONSIBILITIES:**

1. Discuss with the attending physician, interpret and dictate seating clinic physical therapist of ALSA and MDA clinics the consultations on the day of service
2. Edit dictated reports on the following day for attending physician review
3. Work in conjunction with the physical therapists, occupations therapists, speech therapists, nutritionist, a seating clinic specialist, an Apria Health Care representative, and a social worker from the multidisciplinary ALS Association and MDA clinics
4. Organize Muscle and Nerve Biopsy conferences
5. Present EMG/neuromuscular topics
6. Participate in Journal Club
7. Prepare for participation in the Carrell-Krusen Symposium in Neuromuscular Disease
8. Give one case presentation per year
9. Participate in neuromuscular lectures to neurology residents
10. Suggested reading:

    Feldman, Grisold, Russell and Zifko: *Atlas of Neuromuscular Diseases*
    Amato and Russell: *Neuromuscular Disorders*
    Engel and Franzini-Armstrong: *Myology*
    Dyck and Thomas: *Peripheral Neuropathy*
    Mendell, Kissel and Cornblath: *Diagnosis and Management of Peripheral Nerve Disorders*
    Mitumoto, Przedborski, Gordon: *Amyotrophic Lateral Sclerosis*
    Engel: *Myasthenia Gravis and Myasthenic Disorders*
    Dumitriu and Amato: *Electrodiagnostic Medicine*
    Brown and Bolton: *Clinical Electromyography*
    Levin and Luders: *Comprehensive Clinical Neurophysiology*
    Preston and Shapiro: *Electromyography and Neuromuscular Disorders*
    Kimura: *Electrodiagnosis in Disease of Nerve and Muscle*

At the beginning of the academic year, fellows are provided with a flash-drive containing an extensive list of published references on a variety of neuromuscular diseases

**I. Clinical Science/Medical Knowledge**

**Goal:** Fellows must demonstrate knowledge about established and evolving neuroscience that would be critical to the practice of rehabilitative medicine and chemodenervation (with Dr. Dubinsky while assigned to the VA on Thursday mornings)
Objectives/Knowledge – Fellows will demonstrate knowledge of:

1. The theoretical basis for clinical interventions used in neuromuscular medicine
2. Major disorders, including:
   a) the epidemiology of the disorders
   b) the etiology of the disorder, including contributing medical, genetic and social factors
   c) the phenomenology of the disorder
   d) diagnostic criteria
   e) appropriate evaluation
   f) course and prognosis
   g) effective treatment strategies
3. Pathophysiology of major Neuromuscular Medicine disorders and familiarity with the scientific basis of neurologic diseases, including:
   a) neuroanatomy
   b) neuropathology
   c) neurochemistry
   d) neurophysiology
   e) neuropharmacology
   f) neuroimmunology/neurovirology
   g) neurogenetics/molecular neurology and neuroepidemiology
   h) neuroimaging
   i) neuro-ophthalmology
   j) neuro-otology
   k) cerebrospinal fluid
   l) neurological rehabilitation
   m) issues related to neuromuscular disorders
4. Gross and microscopic specimens taken from the normal nervous system and from patients with major neuromuscular disorders

Objectives/Skills – Fellows will demonstrate ability to:

1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
   i) neuromuscular examination

2. Create differential diagnoses:
   a) to determine if a patient’s symptoms are the result of a disease affecting the central and/or peripheral nervous system or are of another origin
   b) to make a formulation, laboratory investigation, and cost-effective management plan
   c) rehabilitation plan

3. To recognize and treat major neuromuscular and musculoskeletal disorders
**Objective/Attitudes** – Fellows must maintain and apply an investigatory and analytic thinking approach to clinical situations

**Demonstrated by:**
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning

**Evaluation:**
Fellow evaluation
Formal and informal observation

**Remediation:**
The program director will semi-annually review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

II. **Patient Care**

**Goal:** Fellows must be able to provide patient care that is compassionate, appropriate and effective for the treatment of neurological problems

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. The lesion localization and differential diagnosis in neuromuscular disorders
2. Investigational plan
3. Interpretation of NCS, EMG and muscle, nerve and skin biopsies
4. Available treatment methods for the major neuromuscular medicine disorders and the evidence which supports their use
5. Preventive interventions used in neuromuscular medicine

**Objectives/Skills** – Fellows will demonstrate the ability to:
1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
2. Create differential diagnoses
3. Evaluate, assess and recommend cost-effective management of patients
4. Recognize and treat neuromuscular medicine disorders
5. Apply the use of electrical, tissue pathological and mechanical methods in the evaluation and treatment of a wide range of diseases
Objectives/Attitudes – Fellows will:
1. Be strong advocates for the patient’s best interests
2. Strive to provide quality care within available resources
3. Be sensitive to patient’s cultural differences
4. Be sensitive to confidentiality and consent issues

Demonstrated by:
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning; direct observation by faculty during clinics and on clinic rotations; case conferences; chart review with supervisors

Evaluation:
Supervision and rotation evaluations
Formal and informal observations

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

III. Interpersonal and Communication Skills

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to develop and maintain appropriate interpersonal relationships and to communicate effectively with patients, families, colleagues and the public.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Interviewing techniques
2. Communication techniques

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties. This shall include:
   a) knowing when to solicit consultation and having sensitivity to assess the need for consultation
   b) discussing consultation findings with patients and their families
   c) evaluating the consultation findings
2. Serve as an effective consultant to other medical specialists and community agencies. This shall include:
   a) communicating effectively with the requesting party to refine the consultation question
   b) maintain the role of consultant
   c) communicate clear and specific recommendations
   d) respect the knowledge and expertise of the requesting party
3. Demonstrate the ability to communicate effectively with patients and their families by:
   a) gearing all communication to the educational/intellectual levels of patients and their families
b) providing explanations of neuromuscular medicine disorders and treatment (both verbally and in written form) that are jargon-free and geared to the educational/intellectual level of patients and their families

c) providing preventive education that is understandable and practical as well as applicable

d) respecting the patient’s cultural, ethnic and economic background

e) developing and enhancing rapport and a working alliance with patients and their families

4. Maintain medical records and written prescriptions that are legible and up-to-date. These records must capture essential information while simultaneously respecting patient privacy and be useful to health professionals outside neuromuscular medicine

   a) recognize the need for, and effectively use, interpreters when necessary
   b) give one Grand Rounds per year and/or present at a national or regional meeting
   c) present up-to-date information to students and residents in an organized fashion
   d) provide feedback to students, residents and other professionals

Objectives/Attitudes – Fellows will:

1. Maintain an attitude of respect for others, even those with differing points of view
2. Exhibit culturally sensitive, professional, ethically sound behavior in all patient and professional interactions
3. Maintain an attitude of interdisciplinary collaboration
4. Maintain a polite and courteous attitude at all times

Demonstrated by:
Chart documentation; direct observation; teaching others; professional relationships; formal presentations; independent learning; seeking feedback on communication and performance

Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:

1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

IV. Practice Based Learning and Improvement

Goal: Fellows will demonstrate knowledge, skills and attitudes necessary to initiate self-directed and independent learning. Fellows must keep abreast of current information and practices relevant to neuromuscular medicine.

Objectives/Knowledge – Fellows will demonstrate knowledge of:

1. Research methodology, including critical assessment of professional journal articles
2. Principles of evidence-based medicine
3. Awareness of available information technologies and the ability to assess them

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate up-to-date information from the scientific and practice literature to assist in the quality of care of patients. This shall include:
   a) use of medical libraries
   b) use of information technology, including internet-based searches and literature databases (e.g., Medline)
   c) use of drug information databases
   d) active participation, as appropriate, in educational courses, conferences and other organized educational activities both at the local and national levels
   e) conducting and presenting reviews of current research in such formats as journal clubs, Grand Rounds and/or original publications
   f) participation in funded research projects
2. Assess the generalizability or applicability of research findings to patients in relation to their socio-demographic and clinical characteristics. The physician shall demonstrate the ability to critically evaluate the relevant medical literature
3. Evaluate the caseload and practice experience in a systematic manner. This may include:
   a) case-based learning
   b) the review of patient records and outcomes
   c) obtaining appropriate supervision and consultation
   d) maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

Evaluation:
Direct observation
Rotation evaluation

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies
V. Professionalism and Ethical Behavior

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to practice professionally responsible, ethical and compassionate care in neuromuscular medicine

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. The impact of gender, culture, religion, socioeconomic factors, and family structures and systems on issues pertaining to neuromuscular medicine
2. The different roles a neuromuscular specialist might fulfill in different settings
3. Legal issues relevant to neuromuscular medicine
4. Ethical issues in neuromuscular medicine. This includes knowledge of the American Academy of Neurology Code of Ethics
5. Ethical issues important in conducting research with humans and the role of the Committee for Protection of Human Subjects

Objectives/Skills – Fellows will be able to:
1. Respond to communications from patients and health professionals in a timely manner. If unavailable, the physician shall establish and communicate back-up arrangements
2. Use medical records for appropriate documentation of the course of illness and its treatment
3. Provide continuity of care including appropriate consultation, transfer or termination of patients (clinic rotation)
4. Demonstrate ethical behavior, integrity, honesty, professional conduct, compassion and confidentiality in the delivery of patient care, including obtaining informed consent/assent, and declaring conflict of interest
5. Demonstrate respect for patients and colleagues as individuals by showing sensitivity to their age, culture, disabilities, ethnicity, gender, socioeconomic background, religious beliefs, political affiliations, and sexual orientation
6. Demonstrate appreciation of end-of-life care and issues regarding provision for or withholding of care
7. Acknowledge responsibility for his or her decisions and demonstrate commitment to the review and remediation of his or her professional conduct
8. Promote the highest standards of medical healthcare to the public and participate in the review of the professional conduct of his or her colleagues

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

Evaluation:
Rotation evaluation
Regular review by the program director
Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

VI. Systems Based Practice

Goal: Fellows must demonstrate the knowledge, skills and attitudes necessary to effectively in multiple, diverse, complex systems of care to provide effective treatment, consultations and referrals for patients.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Basic concepts of systems theory
2. How patient care practices of fellows and residents and related actions impact component units of health care delivery
3. Systems-based approaches for controlling health care costs and allocating resources

Objectives/Skills – Fellows will be able to:
1. Advocate for patients within a variety of systems
2. Partner with insurance and managed care companies to meet patient needs
3. Strive to practice cost-effective health care and resource allocation that does not compromise the quality of care

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of interdisciplinary collaboration, advocacy and cooperation
2. Maintain flexibility in adapting to the needs and expectations of different settings and systems
3. Maintain the patient’s best interests as the top priority

Demonstrated by:
Care of patients; interactions with other agencies involved in the care of patients; consultation with other professionals; participation in Quality Assurance, Utilization Review and Performance Improvement committees; self-directed independent learning; teaching others

Evaluation:
Rotation evaluation
Regular review by the program director

Remediation:
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies
E. NEUROMUSCULAR RESEARCH ELECTIVE ROTATION:

The Neuromuscular Research Elective rotation is a two-month longitudinal rotation throughout the year located in the Landon Center on Aging and the Clinical Translational Science Unit (CTSU). Fellows are involved in the design, conduct and result interpretation of studies with close faculty supervision with direct longitudinal involvement throughout the year in all KU investigator-initiated studies and in other neuromuscular research studies. During this rotation each fellow works in conjunction with the neuromuscular research faculty to gain knowledge in neuromuscular research trials, endpoint measures and their applications, benefits and limitations.

Fellows are required to participate in the four-week Introduction to Biostatistics for Clinical and Translational Researchers course offered through FRONTIERS: The Heartland Institute for Clinical and Translational Research.

Additionally, fellows are expected to become familiar with the following on-line courses and information designed to assist investigators in understanding clinical research and developing proposals/grant submissions for potential funding:

- **CITI GCP, CITI for Biomedical Researchers and Introduction to the Principles and Practice of Clinical Research (IPPCR)** – a lecture in real time with the archive videos available. Course runs from October-March. Previous year is available at any time
- **Certification in:**
  a. Human Subjects Research – CITI Biomedical Researchers Basic Course
  b. Good Clinical Practice – FDA Focus
  d. Responsible Conduct of Research – Responsible conduct of research
  e. Clinical Research Coordinator (CRC)
- **University of Iowa Institute for Clinical and Translational Sciences – Clinical Research Professionals Basic Certificate Course** (through ICTS Virtual University – account creation/login required). Provides basic introduction to clinical research and also offers courses on bioethics, genetics and pharmacology
- **NIH Grants and Funding – About Grants** – site that provides the investigator with grant writing guidance, strategy and instruction
- **CTSpedia** – a collaborative vehicle for the CTSA’s Biostatistics/Epidemiology/Research/Design (BERD) Online Resources and Education Task Force to identify and share resources across the national consortium and community researchers world-wide. [BERD Educational Materials](CTSpedia) links to biostats course materials, searchable by keyword, format, audience, etc., submitted by many consortium institutions
- **NIH Ethical and Regulatory Aspects of Clinical Research** – full links to course including syllabus, readings, videocasts and podcasts of lectures. The 2017 course will register in the summer
- **CTSA Central Education and Training resources** – provides links to various resources at CTSA consortium institutions
DELINEATION OF RESIDENT RESPONSIBILITIES:

1. Discuss with the attending physician, interpret and type neuromuscular research reports on the day of service
2. Fellow is required to design and execute a project with faculty mentorship
3. Work in conjunction with the research coordinators, research assistants, investigators, clinical evaluators and staff of the GCRC
4. Organize and present at Muscle and Nerve Biopsy conferences
5. Present EMG/neuromuscular topics
6. Participate in Journal Club
7. Prepare for participation in the Carrell-Krusen Symposium in Neuromuscular Disease
8. Give case presentations to visiting professors and once per year present Grand Rounds about the VMR Fellowship experience. Present research projects at national meetings.
9. Participate in neuromuscular lectures to neurology residents and attend evidence-based medicine lectures given by Dr. Gronseth
10. Attend and successfully complete the CITI Training Certification.
11. Participate in ongoing research and create one or more mentored research plans.
12. Suggested reading:
   Calvin-Naylor NA et al - Education and Training of Clinical and Translational Study Investigators and Research Coordinators: A Competency Based Approach
   doi: 10.1017/cts.2016.2 Epub 2017 Jan 13

   Enhancing Clinical Research Professionals’ Training and Qualifications (ECRPTQ):
   Recommendations for Good Clinical Practice (GCP) Training for Investigators and Study Coordinators
   *J Clin Transl Sci* 2017
   doi: 10.1017/cts.2016.1

   Clinical Trials in Neurology: Design, Conduct, Analysis, 1st edition. Bernard Ravina (editor), Jeffrey Cummings (editor), Michale McDermott (editor), R. Michael Poole (editor)

   Feldman, Grisold, Russell and Zifko: *Atlas of Neuromuscular Diseases*
   Amato and Russell: *Neuromuscular Disorders*
   Engel and Franzini-Armstrong: *Myology*
   Dyck and Thomas: *Peripheral Neuropathy*
   Mendell, Kissel and Cornblath: *Diagnosis and Management of Peripheral Nerve Disorders*
   Mitsumoto, Przdebski, Gordon: *Amyotrophic Lateral Sclerosis*
   Engel: *Myasthenia Gravis and Myasthenic Disorders*
   Dumitru and Amato: *Electrodiagnostic Medicine*
   Brown and Bolton: *Clinical Electromyography*
   Levin and Luders: *Comprehensive Clinical Neurophysiology*
   Preston and Shapiro: *Electromyography and Neuromuscular Disorders*
   Kimura: *Electrodiagnosis in Disease of Nerve and Muscle*

   At the beginning of the academic year, fellows are provided with a flash-drive containing an extensive list of published references on a variety of neuromuscular diseases
I. Clinical Science/Medical Knowledge

Goal: Fellows must demonstrate knowledge about established and evolving neuroscience that would be critical to the practice of rehabilitative medicine and chemodenervation.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. The theoretical basis for clinical interventions used in neuromuscular medicine
2. Major disorders, including:
   a) the epidemiology of the disorders
   b) the etiology of the disorder, including contributing medical, genetic and social factors
   c) the phenomenology of the disorder
   d) diagnostic criteria
   e) appropriate evaluation
   f) course and prognosis
   g) effective treatment strategies
3. Pathophysiology of major Neuromuscular Medicine disorders and familiarity with the scientific basis of neurologic diseases, including:
   a) neuroanatomy
   b) neuropathology
   c) neurochemistry
   d) neurophysiology
   e) neuropharmacology
   f) neuroimmunology/neurovirology
   g) neurogenetics/molecular neurology and neuroepidemiology
   h) neuroimaging
   i) neuro-ophthalmology
   j) neuro-otology
   k) cerebrospinal fluid
   l) neurological rehabilitation
   m) issues related to neuromuscular disorders
4. Gross and microscopic specimens taken from the normal nervous system and from patients with major neuromuscular disorders

Objectives/Skills – Fellows will demonstrate ability to:
1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
   i) neuromuscular examination
2. Create differential diagnoses:
   a) to determine if a patient’s symptoms are the result of a disease affecting the
central and/or peripheral nervous system or are of another origin
   b) to make a formulation, laboratory investigation, and cost-effective
      management plan
   c) rehabilitation plan
3. To recognize and treat major neuromuscular and musculoskeletal disorders

**Objective/Attitudes** – Fellows must maintain and apply an investigatory and analytic thinking approach to clinical situations

**Demonstrated by:**
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning

**Evaluation:**
Fellow evaluation
Formal and informal observation

**Remediation:**
The program director will semi-annually review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

II. **Patient Care**

**Goal:** Fellows must be able to provide patient care that is compassionate, appropriate and effective for the treatment of neurological problems

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. The lesion localization and differential diagnosis in neuromuscular disorders
2. Investigational plan
3. Interpretation of NCS, EMG and muscle, nerve and skin biopsies
4. Available treatment methods for the major neuromuscular medicine disorders and the evidence which supports their use
5. Preventive interventions used in neuromuscular medicine

**Objectives/Skills** – Fellows will demonstrate the ability to:
1. Perform and document a comprehensive history and examination to include, as appropriate:
   a) chief complaint
   b) history of present illness
   c) developmental history
   d) past medical history
   e) review of systems
   f) family history
   g) social history
   h) mental status
2. Create differential diagnoses
3. Evaluate, assess and recommend cost-effective management of patients
4. Recognize and treat neuromuscular medicine disorders
5. Apply the use of electrical, tissue pathological and mechanical methods in the evaluation and treatment of a wide range of diseases

**Objectives/Attitudes** – Fellows will:
1. Be strong advocates for the patient’s best interests
2. Strive to provide quality care within available resources
3. Be sensitive to patient’s cultural differences
4. Be sensitive to confidentiality and consent issues

**Demonstrated by:**
Clinical care of patients; teaching residents and other professionals; formal presentations at conferences; self-initiated independent learning; direct observation by faculty during clinics and on clinic rotations; case conferences; chart review with supervisors

**Evaluation:**
Supervision and rotation evaluations
Formal and informal observations

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**III. Interpersonal and Communication Skills**

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to develop and maintain appropriate interpersonal relationships and to communicate effectively with patients, families, colleagues and the public.

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. Interviewing techniques
2. Communication techniques

**Objectives/Skills** – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties. This shall include:
   a) knowing when to solicit consultation and having sensitivity to assess the need for consultation
   b) discussing consultation findings with patients and their families
   c) evaluating the consultation findings
2. Serve as an effective consultant to other medical specialists and community agencies. This shall include:
   a) communicating effectively with the requesting party to refine the consultation question
b) maintain the role of consultant  
c) communicate clear and specific recommendations  
d) respect the knowledge and expertise of the requesting party  

3. Demonstrate the ability to communicate effectively with patients and their families by:  
a) gearing all communication to the educational/intellectual levels of patients and their families  
b) providing explanations of neuromuscular medicine disorders and treatment (both verbally and in written form) that are jargon-free and geared to the educational/intellectual level of patients and their families  
c) providing preventive education that is understandable and practical as well as applicable  
d) respecting the patient’s cultural, ethnic and economic background  
e) developing and enhancing rapport and a working alliance with patients and their families  

4. Maintain medical records and written prescriptions that are legible and up-to-date. These records must capture essential information while simultaneously respecting patient privacy and be useful to health professionals outside neuromuscular medicine  
a) recognize the need for, and effectively use, interpreters when necessary  
b) give one Grand Rounds per year and/or present at a national or regional meeting  
c) present up-to-date information to students and residents in an organized fashion  
d) provide feedback to students, residents and other professionals  

Objectives/Attitudes – Fellows will:  
1. Maintain an attitude of respect for others, even those with differing points of view  
2. Exhibit culturally sensitive, professional, ethically sound behavior in all patient and professional interactions  
3. Maintain an attitude of interdisciplinary collaboration  
4. Maintain a polite and courteous attitude at all times  

Demonstrated by:  
Chart documentation; direct observation; teaching others; professional relationships; formal presentations; independent learning; seeking feedback on communication and performance  

Evaluation:  
Direct observation  
Rotation evaluation  

Remediation:  
The program director will regularly review the fellow’s performance and will:  
1. Identify any specific deficits  
2. Document all areas requiring remediation or additional concentration  
3. Provide additional recommendations for remediation of specific deficiencies
IV. Practice Based Learning and Improvement

Goal: Fellows will demonstrate knowledge, skills and attitudes necessary to initiate self-directed and independent learning. Fellows must keep abreast of current information and practices relevant to neuromuscular medicine.

Objectives/Knowledge – Fellows will demonstrate knowledge of:
1. Research methodology, including critical assessment of professional journal articles
2. Principles of evidence-based medicine
3. Awareness of available information technologies and the ability to assess them

Objectives/Skills – Fellows will be able to:
1. Demonstrate the ability to obtain, interpret and evaluate up-to-date information from the scientific and practice literature to assist in the quality of care of patients. This shall include:
   a) use of medical libraries
   b) use of information technology, including internet-based searches and literature databases (e.g., Medline)
   c) use of drug information databases
   d) active participation, as appropriate, in educational courses, conferences and other organized educational activities both at the local and national levels
   e) conducting and presenting reviews of current research in such formats as journal clubs, Grand Rounds and/or original publications
   f) participation in funded research projects
2. Assess the generalizability or applicability of research findings to patients in relation to their socio-demographic and clinical characteristics. The physician shall demonstrate the ability to critically evaluate the relevant medical literature
3. Evaluate the caseload and practice experience in a systematic manner. This may include:
   a) case-based learning
   b) the review of patient records and outcomes
   c) obtaining appropriate supervision and consultation
   d) maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors

Objectives/Attitudes – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices

Demonstrated by:
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

Evaluation:
Direct observation
Rotation evaluation
**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**V. Professionalism and Ethical Behavior**

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to practice professionally responsible, ethical and compassionate care in neuromuscular medicine

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. The impact of gender, culture, religion, socioeconomic factors, and family structures and systems on issues pertaining to neuromuscular medicine
2. The different roles a neuromuscular specialist might fulfill in different settings
3. Legal issues relevant to neuromuscular medicine
4. Ethical issues in neuromuscular medicine. This includes knowledge of the American Academy of Neurology Code of Ethics
5. Ethical issues important in conducting research with humans and the role of the Committee for Protection of Human Subjects

**Objectives/Skills** – Fellows will be able to:
1. Respond to communications from patients and health professionals in a timely manner. If unavailable, the physician shall establish and communicate back-up arrangements
2. Use medical records for appropriate documentation of the course of illness and its treatment
3. Provide continuity of care including appropriate consultation, transfer or termination of patients (clinic rotation)
4. Demonstrate ethical behavior, integrity, honesty, professional conduct, compassion and confidentiality in the delivery of patient care, including obtaining informed consent/assent, and declaring conflict of interest
5. Demonstrate respect for patients and colleagues as individuals by showing sensitivity to their age, culture, disabilities, ethnicity, gender, socioeconomic background, religious beliefs, political affiliations, and sexual orientation
6. Demonstrate appreciation of end-of-life care and issues regarding provision for or withholding of care
7. Acknowledge responsibility for his or her decisions and demonstrate commitment to the review and remediation of his or her professional conduct
8. Promote the highest standards of medical healthcare to the public and participate in the review of the professional conduct of his or her colleagues

**Objectives/Attitudes** – Fellows will:
1. Maintain an attitude of inquiry and scholarship, recognizing the need for lifelong learning
2. Maintain openness and flexibility in treatment approaches with patients, assimilating new knowledge in patient care practices
**Demonstrated by:**
Self-directed inquiry guiding clinical care of patients; formal presentations which include literature review; teaching others

**Evaluation:**
Rotation evaluation
Regular review by the program director

**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**VI. Systems Based Practice**

**Goal:** Fellows must demonstrate the knowledge, skills and attitudes necessary to effectively in multiple, diverse, complex systems of care to provide effective treatment, consultations and referrals for patients.

**Objectives/Knowledge** – Fellows will demonstrate knowledge of:
1. Basic concepts of systems theory
2. How patient care practices of fellows and residents and related actions impact component units of health care delivery
3. Systems-based approaches for controlling health care costs and allocating resources

**Objectives/Skills** – Fellows will be able to:
1. Advocate for patients within a variety of systems
2. Partner with insurance and managed care companies to meet patient needs
3. Strive to practice cost-effective health care and resource allocation that does not compromise the quality of care

**Objectives/Attitudes** – Fellows will:
1. Maintain an attitude of interdisciplinary collaboration, advocacy and cooperation
2. Maintain flexibility in adapting to the needs and expectations of different settings and systems
3. Maintain the patient’s best interests as the top priority

**Demonstrated by:**
Care of patients; interactions with other agencies involved in the care of patients; consultation with other professionals; participation in Quality Assurance, Utilization Review and Performance Improvement committees; self-directed independent learning; teaching others

**Evaluation:**
Rotation evaluation
Regular review by the program director
**Remediation:**
The program director will regularly review the fellow’s performance and will:
1. Identify any specific deficits
2. Document all areas requiring remediation or additional concentration
3. Provide additional recommendations for remediation of specific deficiencies

**Fellow Duties/Expectations:**
The neuromuscular fellow is expected to submit and present abstract(s) pertaining to their research project at regional and national scientific meetings. During the last month of fellowship, on a designated date and time, each fellow is expected to give a 15-minute presentation about their year’s research. An award will be given for the best presentation/project and the name of the winner placed yearly on a plaque. The best research project will be selected based on the novelty of the concept, potential for publication in a peer-reviewed journal and the likelihood of obtaining intramural or extramural research funding to expand the research project. An attempt should be made to complete and submit the results of the study to a peer-reviewed journal.
SUPERVISION OF FELLOWS

A. Supervision of Residents
   • Each patient must have an identifiable, appropriately credentialed and privileged attending physician (or licensed independent practitioner as specified by each Review Committee) who is responsible and accountable for that patient’s care. VI.A.2.a).(1)
   • This information must be available to residents, faculty members, other members of the health care team, and patients. VI.A.2.a).(1)(a)
     ○ Inpatient: Patient information sheet included in the admission packet and listed on the “white board” in each patient room
     ○ Outpatient: Provided during introduction verbally by residents and/or faculty
   • Residents and faculty members must inform patients of their respective roles in each patient’s care when providing direct patient care. VI.A.2.a).(1)(b)
   • The program must demonstrate that the appropriate level of supervision in place for all residents is based on each resident’s level of training and ability, as well as patient complexity and acuity. Supervision may be exercised through a variety of methods, as appropriate to the situation. VI.A.2.b).(1)

B. Methods of Supervision.
   • Supervision may be exercised through a variety of methods.
   • For many aspects of patient care, the supervising physician may be a more advanced resident or fellow.
   • Other portions of care provided by the resident can be adequately supervised by the appropriate availability of the supervising faculty member, fellow or senior resident physician, and either on site or by means of telecommunication technology. Some activities require the physical presence of the supervising faculty member. In some circumstances, supervision may include post-hoc review of resident delivered care with feedback. VI.A.2.b)
   • The program must demonstrate that the appropriate level of supervision in place for all residents is based on each resident’s level of training and ability, as well as patient complexity and acuity.
   • Supervision may be exercised through a variety of methods, as appropriate to the situation. VI.A.2.b).(1)
   • The Review Committee may specify which activities require different levels of supervision. VI.A.2.b).(1)
   • The program must define when physical presence of a supervising physician is required. (Core) VI.A.2.b).(2)

C. Levels of Supervision Defined
   To promote appropriate resident supervision while providing for graded authority and responsibility, the program must use the following classification of supervision:
   **Direct Supervision:**
   • Direct A: The supervising physician is physically present with the resident during the key portions of the patient interaction or, VI.A.2.c).(1).(a) PGY-1 residents must initially be supervised directly only as described in VI.A.2.c).(1).(a) [The Review Committee may describe the conditions under which PGY-1 residents progress to be supervised indirectly]
- **Direct B**: The supervising physician and/or patient is not physically present with the resident and the supervising physician is concurrently monitoring the patient care through appropriate telecommunication technology. [The Review Committee must further specify if VI.A.2.c).(1).(b) is permitted] [The Review Committee will choose to require either VI.A.2.c).(1).(a), or both VI.A.2.c).(1).(a) and VI.A.2.c).(1).(b)] VI.A.2.c).(1).(b)

**Indirect Supervision:**

The supervising physician is not providing physical or concurrent visual or audio supervision but is immediately available to the resident for guidance and is available to provide appropriate direct supervision. VI.A.2.c).(2)

**Oversight:**

- The supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered. VI.A.2.c).(3)

The privilege of progressive authority and responsibility, conditional independence, and as supervisory role in patient care delegated to each resident must be assigned by the program director and faculty members. VI.A.2.d)

<table>
<thead>
<tr>
<th>Per Program Specific RRC Requirements</th>
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<tbody>
<tr>
<td>Each patient must have an identifiable and appropriately-credentialed and privileged attending physician (or RRC APPROVED LICENSED INDEPENDENT PRACTITIONER SUPERVISOR) who is responsible and accountable for the patient’s care, and this information must be available to the residents, faculty members, other members of the health care team and patients. (PR VI.A.2.a (1)</td>
</tr>
<tr>
<td>VI.A.2.a).(1) Each patient must have an identifiable and appropriately-credentialed and privileged attending physician (or licensed independent practitioner as specified by the applicable Review Committee) who is responsible for the patient’s care. (core)</td>
</tr>
<tr>
<td>VI.A.2.a).(1).(a) This information must be available to fellows, faculty members, other members of the health care team, and patients. (core)</td>
</tr>
<tr>
<td>VI.A.2.a).(1).(b) Fellows and faculty members must inform each patient of their respective roles in that patient’s care when providing direct patient care. (core)</td>
</tr>
<tr>
<td>All members of the health care team introduce themselves to the patients and describe their role and identify the attending physician and other important team members.</td>
</tr>
<tr>
<td>Residents and Faculty members must inform each patient of their respective roles in patient care, when providing direct patient care. VI.A.2.a). (1).(b)</td>
</tr>
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<td>All members of the health care team introduce themselves to the patients and describe their role and identify the attending physician and other important team members.</td>
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</tr>
</tbody>
</table>

58
VI.A.2.b) Supervision may be exercised through a variety of methods. For many aspects of patient care, the supervising physician may be a more advanced fellow. Other portions of care provided by the fellow can be adequately supervised by the appropriate availability of the supervising faculty member or fellow, either on site or by means of telecommunication technology. Some activities require the physical presence of the supervising faculty member. In some circumstance, supervision may include post-hoc review of fellow-delivered care with feedback.

VI.A.2.b).(1) The program must demonstrate that the appropriate level of supervision in place for all fellows is based on each fellow’s level of training and ability, as well as patient complexity and acuity. Supervision may be exercised through a variety of methods, as appropriate to the situation. (core)

VI.A.2.b).(2) The program must define when physical presence of a supervising physician is required. (core)

The privilege of progressive authority and responsibility, conditional independence, and a supervisory role in patient care delegated to each resident must be assigned by the Program Director and faculty members. (PR VI.A.2.d).(1,2,3)

VI.A.2.d).(1) The program director must evaluate each fellow’s abilities based on specific criteria, guided by the Milestones. (core)

VI.A.2.d).(2) Faculty members functioning as supervising physicians must delegate portions of care to fellows based on the needs of the patient and skills of each fellow (core)

VI.A.2.d).(3) Fellows should serve in a supervisory role to junior fellows and residents in recognition of their progress toward independence, based on the needs of each patient and the skills of the individual resident or fellow. (detail)

RARE CIRCUMSTANCES WHEN RESIDENTS may elect to stay or return to the clinical site: (PR VI.F.4.a.)

VI.F.4.a) In rare circumstances, after handing off all other responsibilities, a fellow, on their own initiative, may elect to remain or return to the clinical site in the following circumstances:

VI.F.4.a).(1) to continue to provide care to a single severely ill unstable patient; (detail)

VI.F.4.a).(2) humanistic attention to the needs of a patient or family; or, (detail)

VI.F.4.a).(3) to attend unique educational events. (detail)

DEFINED MAXIMUM NUMBER OF CONSECUTIVE WEEKS OF NIGHT FLOAT AND MAXIMUM NUMBER OF MONTHS PER YEAR OF IN-HOUSE NIGHT FLOAT (PR VI.F.6.)

VI.F.6 Night float must occur within the context of the 80-hour and one-day-off-in-seven requirements. (core)

VI.F.7. Fellows must be scheduled for in-house call no more frequently than every third night (when averaged over a four-week period). (core)

Program-specific guidelines for circumstances and events in which residents must communicate with appropriate supervising faculty (PR VI.A.2.e)

1. Admission to Hospital
2. Transfer of patient to a higher level of care
3. Clinical deterioration, especially if unexpected
4. End-of-life decisions
5. Change in code status
6. Red Events
7. Change in plan of care, unplanned emergent surgery or planned procedure that does not occur
8. Procedural complication
9. Unexpected patient death

VI.A.2.e).(1) Each fellow must know the limits of their scope of authority, and the circumstances under which the fellow is permitted to act with conditional independence. (outcome)
### PGY 1

<table>
<thead>
<tr>
<th>LEVEL of SUPERVISION</th>
<th>ACTIVITIES /PROCEDURES (as defined by RRC &amp; Program)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRECT A</td>
<td>N/A</td>
</tr>
<tr>
<td>DIRECT B</td>
<td>N/A</td>
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<tr>
<td>INDIRECT</td>
<td>N/A</td>
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</table>

### All OTHER RESIDENTS

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<thead>
<tr>
<th>LEVEL of SUPERVISION</th>
<th>ACTIVITIES /PROCEDURES (as defined by RRC &amp; Program)</th>
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</thead>
<tbody>
<tr>
<td>DIRECT A</td>
<td>Tissue biopsy, EMG/NCS, consultation, research visits</td>
</tr>
<tr>
<td>DIRECT B</td>
<td>N/A</td>
</tr>
<tr>
<td>INDIRECT</td>
<td>Tissue biopsy, EMG/NCS, consultation, research visits</td>
</tr>
<tr>
<td>OVERSIGHT</td>
<td>Consultation, research visits</td>
</tr>
</tbody>
</table>
PROGRAM ADMINISTRATION

The Program Director develops and oversees the implementation of a curriculum to educate fellows and other health care professionals in neuromuscular disease. To this end, the Program Director reviews applications, oversees the interview process, interviews and selects applicants for positions in the fellowship program, ensures fellow evaluations are completed at least every other month, and quarterly evaluates the fellows with feedback on the individual fellows, identifies fellows who are academically or emotionally troubled and require intervention, chairs the Fellowship Coordinating Committee, performs direct care of patients with neuromuscular disease, participates in teaching activities by preceptoring inpatient and outpatient neuromuscular medicine services and delivering lectures, and performs neuromuscular medicine research and ensures that fellows participate in departmental research.

The Program Director is accountable for the operations of the fellowship program; together with the neuromuscular medicine faculty, he/she is responsible for the general administration of the program as well as for establishing and maintaining a stable educational environment. This includes all activities related to recruitment, selection, instruction, supervision, counseling, evaluation and advancement of the fellow(s), as well as maintenance of all records relevant to program accreditation.

Qualifications of the Program Director include Board certification in neuromuscular medicine, licensure in the State of Kansas, an active medical staff appointment and demonstrated educational and administrative expertise.

Administration and maintenance of the educational environment in each of the ACGME competency areas includes, but is not limited to:

- oversight of the quality of all didactic and clinical education, including preparing and implementing a comprehensive, well-organized and effective curriculum that includes the presentation of core specialty knowledge supplemented by the addition of current information
- ensures neuromuscular medicine fellows are provided with direct experience in progressive responsibility for patient management
- ensures that a formal curriculum exists for bioethics, cost-effective care, and palliative care as well as psychological support and counseling for patients and families
- participation in the evaluation of program faculty
- monitoring and oversight of participating sites
- preparation and timely submission of all information required or requested by the ACGME
- documented semi-annual and final performance evaluations, with feedback, of each clinical neurophysiology fellow
- ensuring compliance with grievance and due process procedures
- monitors neuromuscular medicine policies and procedures to ensure they are consistent with institutional and program requirements for fellow work hours and the working environment, including moonlighting
- monitors the need for, and ensures, the provision of back-up support systems in case patient care responsibilities are unusually difficult or prolonged
- complies with sponsoring institution policies and procedures, including those for selection, evaluation and promotion of residents, disciplinary action and supervision of fellows
- complies with all ACGME policies and procedures
• monitors the well-being of the fellows, including stress and impairment, and ensures that appropriate confidential help is available

Additionally, the Program Director ensures that faculty and fellows meet on a yearly basis to review and complete the Program Outcomes Assessment and Action Plan Report which includes:

1. **Program Quality**
   - ACGME common and specialty RRC requirements
   - ACGME institutional requirements
   - ACGME accreditation letter and correspondence
   - most recent GMEC internal review report
   - previous annual Program Outcomes Assessment and Action Plan Reports
   - overall program educational goals
   - competency-based goals and objectives for each rotation assignment at each PGY-level
   - department Policy and Procedure manual
   - KUMC GME Policy and Procedure manual
   - program letters of agreement
   - department curriculum including conference and didactics schedule
   - annual program, rotation and curriculum evaluations by fellows
   - annual program, rotation and curriculum evaluations by faculty
   - work hour violation reports/work hour monitoring system
   - ACGME and GME Resident/Fellow Survey Summary Data Report and national percentile results

2. **Resident Performance**
   - end-of-rotation competency-based resident evaluations by faculty
   - 360° evaluations of fellows
   - individual fellow patient case and/or procedure logs
   - reports of quarterly Program Director evaluation meetings with fellows
   - final summative evaluations of graduating fellows
   - in-training examination results

3. **Faculty Development**
   - faculty evaluations by fellows
   - annual Program Director evaluative review of fellows
   - annual faculty and resident/fellow publication list
   - annual faculty and resident/fellow presentation list
   - annual faculty and resident/fellow peer-reviewed grant list
   - annual faculty and resident/fellow national committee and educational organization participation list

4. **Graduate Performance**
   - Board certification examination first time pass rate
EDUCATIONAL PROGRAMS

Basic neuromuscular medicine topics will be covered during the one-year training period through a combination of both inpatient and outpatient clinical experiences, basic neuromuscular conferences, and EMG/neuromuscular disease conferences including areas of clinical neurophysiology such as autonomic testing, quantitative sensory testing and single fiber EMG. Fellows are expected to participate in the Introduction of Biostatistics for Clinical and Translational Researchers and Introduction to Clinical Research courses offered through the University of Kansas School of Medicine.

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<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<tbody>
<tr>
<td>7:00-8:00 am</td>
<td></td>
<td>Neuromuscular Lecture Series*</td>
<td>EMG Case Discussion*</td>
<td>Neurology/Neurosurgery Case Presentations*</td>
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<tr>
<td>7:30-8:30 am</td>
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<td>Neuromuscular Research Checklist Meeting</td>
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<tr>
<td>8:00-9:00 am</td>
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<td>EBM Lecture Series*</td>
<td>Neurology/Neurosurgery Grand Rounds*</td>
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<td>12:00-1:00 pm</td>
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<td>Muscle, Skin &amp; Nerve Biopsy Conference or Journal Club*</td>
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* Attendance is required

** Neuromuscular Journal Club 2nd Wednesday of each month: Fellows and neuromuscular faculty present and critically review and article.

EBM (Evidence Based Medicine) Lecture Series: Fellows will analyze study design, statistical methods and conclusions using the principles of evidence-based medicine

Grand Rounds: fellows present once a year

Block Rotation Sample:

<table>
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<th>Jul</th>
<th>Aug</th>
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<tr>
<td>NMM Clinic</td>
<td>NMM Clinic</td>
<td>NMM Clinic</td>
<td>Research Elective</td>
<td>Researc Elective</td>
<td>EMG Lab</td>
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<td>EMG Lab</td>
<td>Rehab</td>
<td>Muscle, Nerve and Skin Pathology Lab</td>
<td>Muscle, Nerve and Skin Pathology Lab</td>
<td>Rehab</td>
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## CLINICAL NEUROPHYSIOLOGY ROTATION SCHEDULE

**July 2020 – June 2021**

<table>
<thead>
<tr>
<th></th>
<th>NMM 1</th>
<th>NMM 2</th>
<th>EEG/Epilepsy- KU/CMH</th>
<th>VA- Neurophysiology</th>
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<tbody>
<tr>
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<td>Mingbunjerdsuk</td>
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<td>Rahman</td>
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<td>AUGUST</td>
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<td>Mingbunjerdsuk (CMH)</td>
<td>Rahman (KU)</td>
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NMM 1 = includes inpatient consults  
NMM 2 = includes inpatient EMG  
EEG/Epilepsy = last month of two-month block is spent at CMH, MO & KS locations

## NEUROMUSCULAR MEDICINE ROTATION SCHEDULE

**July 2020 – June 2021**

<table>
<thead>
<tr>
<th></th>
<th>NMM 1</th>
<th>NMM 2</th>
<th>NMM 3</th>
<th>VA - Neuromuscular</th>
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<td>JULY 2020</td>
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<td>JUNE 2021</td>
<td>McGraw</td>
<td></td>
<td></td>
<td>Fullam</td>
</tr>
</tbody>
</table>

NMM 1 = include inpatient consults  
NMM 2 = includes inpatient EMG  
NMM 3 = includes research elective  
Muscle/Nerve/Skin Biopsy included on Neuromuscular 1, 2, 3 and VA (MO) rotations
### NEUROMUSCULAR MEDICINE FACULTY CONSULT SCHEDULE 2020-2021

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasnoor</td>
<td>July</td>
</tr>
<tr>
<td>Jawdat</td>
<td>August &amp; February</td>
</tr>
<tr>
<td>Jabari</td>
<td>September &amp; March</td>
</tr>
<tr>
<td>Statland</td>
<td>January</td>
</tr>
<tr>
<td>Farmakidis</td>
<td>November &amp; May</td>
</tr>
<tr>
<td>Dimachkie</td>
<td>December &amp; June</td>
</tr>
<tr>
<td>Chandrashekhar</td>
<td>October &amp; April</td>
</tr>
</tbody>
</table>

### DIDACTIC SCHEDULE

#### NEUROMUSCULAR LECTURE SERIES

**2020-2021**  
**Tuesday’s 7:00 – 8:00 AM; Landon Center Room 270**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/7/20</td>
<td>7:00</td>
<td>Muscle Anatomy for EMG/Designing an EMG Study</td>
<td>Farmakidis</td>
</tr>
<tr>
<td></td>
<td>7:30</td>
<td>Facial Nerve &amp; Blink Reflex</td>
<td>Jawdat</td>
</tr>
<tr>
<td>7/14/20</td>
<td>7:00</td>
<td>Nerve Conduction Studies</td>
<td>Jawdat</td>
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<tr>
<td></td>
<td>7:30</td>
<td>Myasthenia Gravis</td>
<td>Pasnoor</td>
</tr>
<tr>
<td>7/21/20</td>
<td>7:00</td>
<td>Introduction to Muscle Biopsies</td>
<td>Dimachkie</td>
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<tr>
<td></td>
<td>7:30</td>
<td>Introduction to Muscle Biopsies</td>
<td>Dimachkie</td>
</tr>
<tr>
<td>7/28/20</td>
<td>7:00</td>
<td>IOM Education Session</td>
<td>IOM</td>
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<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
</tr>
<tr>
<td>8/4/20</td>
<td>7:00</td>
<td>Auditory Evoked Potentials</td>
<td>Pasnoor</td>
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<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
</tr>
<tr>
<td>8/11/20</td>
<td>7:00</td>
<td>Weakness in ICU</td>
<td>Dimachkie</td>
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<tr>
<td></td>
<td>7:30</td>
<td>Weakness in ICU</td>
<td>Dimachkie</td>
</tr>
<tr>
<td>8/18/20</td>
<td>7:00</td>
<td>Synaptic Transmissions</td>
<td>Dimachkie</td>
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<tr>
<td></td>
<td>7:30</td>
<td>Somatosensory Evoked Potentials</td>
<td>Pasnoor</td>
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<tr>
<td>8/25/20</td>
<td>7:00</td>
<td>IOM Education Session</td>
<td>IOM</td>
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<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
</tr>
<tr>
<td>9/1/20</td>
<td>7:00</td>
<td>Anamalous Innervation: Common Errors in Nerve and Temperature Effect</td>
<td>FELLOW/Jawdat</td>
</tr>
<tr>
<td></td>
<td>7:30</td>
<td>Visual Evoked Potentials</td>
<td>Pasnoor</td>
</tr>
<tr>
<td>9/8/20</td>
<td>7:00</td>
<td>Excitable Cells: The Ionic Basis of Membrane Potentials</td>
<td>Dimachkie</td>
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<tr>
<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>9/15/20</td>
<td>7:00</td>
<td>Introduction to Nerve Biopsies</td>
<td>Dimachkie</td>
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<tr>
<td></td>
<td>7:30</td>
<td>Introduction to Nerve Biopsies</td>
<td>Dimachkie</td>
</tr>
<tr>
<td>9/22/20</td>
<td>7:00</td>
<td>IBM/Inflammatory Myopathies</td>
<td>Dimachkie</td>
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<td></td>
<td>7:30</td>
<td>IBM/Inflammatory Myopathies</td>
<td>Dimachkie</td>
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<tr>
<td>9/29/20</td>
<td>7:00</td>
<td>IOM Education Session</td>
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<td>CK/AAN Planning Meeting</td>
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<tr>
<td>Date</td>
<td>Time</td>
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<td>Presenter</td>
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<tr>
<td>10/6/20</td>
<td>7:00</td>
<td>Plexopathies</td>
<td>Jabari</td>
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<td>7:30</td>
<td>Plexopathies</td>
<td>Jabari</td>
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<tr>
<td>10/13/20</td>
<td>7:00</td>
<td>ALS</td>
<td>Jawdat</td>
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<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>10/20/20</td>
<td>7:00</td>
<td>Needle EMG Part I: Principles &amp; Spontaneous Activity</td>
<td>Jawdat</td>
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<tr>
<td></td>
<td>7:30</td>
<td>Needle EMG Part II: Voluntary Activity</td>
<td>Jawdat</td>
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<tr>
<td>10/27/20</td>
<td>7:00</td>
<td>IOM Education Session</td>
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<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>11/3/20</td>
<td>7:00</td>
<td>Mononeuropathies</td>
<td>Pasnoor</td>
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<td></td>
<td>7:30</td>
<td>Mononeuropathies</td>
<td>Pasnoor</td>
</tr>
<tr>
<td>11/10/20</td>
<td>7:00</td>
<td>Neuromuscular Ultrasound</td>
<td>Jawdat</td>
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<td></td>
<td>7:30</td>
<td>Excitable Membranes: Local Responses &amp; Propagation</td>
<td>Dimachkie</td>
</tr>
<tr>
<td>11/17/20</td>
<td>7:00</td>
<td>Axonal vs Demyelinating Nerve Conduction Studies:</td>
<td>Farmakidis</td>
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<tr>
<td></td>
<td></td>
<td>Acquired vs Hereditary Demyelinating Polyneuropathy</td>
<td>Farmakidis</td>
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<td>7:30</td>
<td>Radiculopathies</td>
<td>FELLOW/Jawdat</td>
</tr>
<tr>
<td>11/24/20</td>
<td>7:00</td>
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<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>12/1/20</td>
<td>7:00</td>
<td>Neuromuscular Junction Physiology</td>
<td>Pasnoor</td>
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<td></td>
<td>7:30</td>
<td>Neuromuscular Junction Physiology</td>
<td>Pasnoor</td>
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<tr>
<td>12/8/20</td>
<td>7:00</td>
<td>Diabetic Polyneuropathy</td>
<td>Pasnoor</td>
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<td></td>
<td>7:30</td>
<td>Diabetic Polyneuropathy</td>
<td>Pasnoor</td>
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<tr>
<td>12/15/20</td>
<td>7:00</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>12/22/20</td>
<td>7:00</td>
<td>Waveform Analysis &amp; Near- and Far-Field Concepts</td>
<td>Dimachkie</td>
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<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<td>12/29/20</td>
<td>7:00</td>
<td>IOM Education Session</td>
<td>IOM</td>
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<td></td>
<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>1/5/21</td>
<td>7:00</td>
<td>Adult Muscular Dystrophy</td>
<td>Statland</td>
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<td></td>
<td>7:30</td>
<td>Adult Muscular Dystrophy</td>
<td>Statland</td>
</tr>
<tr>
<td>1/12/21</td>
<td>7:00</td>
<td>Vasculitic Neuropathy</td>
<td>Pasnoor</td>
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<td></td>
<td>7:30</td>
<td>Vasculitic Neuropathy</td>
<td>Pasnoor</td>
</tr>
<tr>
<td>1/19/21</td>
<td>7:00</td>
<td>Immunosuppressive Treatment</td>
<td>Farmakidis</td>
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<td></td>
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<td>Immunosuppressive Treatment</td>
<td>Farmakidis</td>
</tr>
<tr>
<td>1/26/21</td>
<td>7:00</td>
<td>IOM Education Session</td>
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<td>7:30</td>
<td>Cryptogenic Sensory Polyneuropathy</td>
<td>Pasnoor</td>
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<tr>
<td>2/2/21</td>
<td>7:00</td>
<td>Quantitative Electromyography &amp; Special Electromyography</td>
<td>Pasnoor</td>
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<td>7:30</td>
<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>2/9/21</td>
<td>7:00</td>
<td>Signal Conditioning of Neurophysiologic Signals: Amplifiers and Filters</td>
<td>Dimachkie</td>
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<td>CK/AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>2/16/21</td>
<td>7:00</td>
<td>CK Planning</td>
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<td>Faculty/Fellows</td>
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<tr>
<td>2/23/21</td>
<td>7:00</td>
<td>IOM Education Session</td>
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<td>7:30</td>
<td>AAN Planning Meeting</td>
<td>Faculty/Fellows</td>
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<tr>
<td>3/2/21</td>
<td>7:00</td>
<td>CIDP &amp; Related Disorders</td>
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<tr>
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<td>CIDP &amp; Related Disorders</td>
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<tr>
<td>3/9/21</td>
<td>7:00</td>
<td>Channelopathies</td>
<td>Statland</td>
</tr>
<tr>
<td>Date</td>
<td>Time</td>
<td>Topic</td>
<td>Speaker</td>
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<td>3/16/21</td>
<td>7:30</td>
<td>Channelopathies</td>
<td>Statland</td>
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<tr>
<td>3/16/21</td>
<td>7:00</td>
<td>Hereditary Neuropathy</td>
<td>Statland</td>
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<tr>
<td>3/16/21</td>
<td>7:30</td>
<td>Hereditary Neuropathy</td>
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<tr>
<td>3/23/21</td>
<td>7:00</td>
<td>Entrapment Mononeuropathies, Part I</td>
<td>FELLOW/Jabari</td>
</tr>
<tr>
<td>3/23/21</td>
<td>7:30</td>
<td>Entrapment Mononeuropathies, Part II</td>
<td>FELLOW/Jabari</td>
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<tr>
<td>3/30/21</td>
<td>7:00</td>
<td>IOM Education Session</td>
<td>IOM</td>
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<tr>
<td>3/30/21</td>
<td>7:30</td>
<td>Epidermal Nerve Biopsy</td>
<td>Pasnoor</td>
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<tr>
<td>4/6/21</td>
<td>7:00</td>
<td>Floppy Infant Syndrome</td>
<td>Dimachkie</td>
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<td>4/6/21</td>
<td>7:30</td>
<td>Floppy Infant Syndrome</td>
<td>Dimachkie</td>
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<tr>
<td>4/13/21</td>
<td>7:00</td>
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<td>Staff/Fellows</td>
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<td>Staff/Fellows</td>
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<tr>
<td>4/20/21</td>
<td>7:00</td>
<td>AAN Annual Meeting (4/17-4/23 @ San Francisco)</td>
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<td>4/20/21</td>
<td>7:30</td>
<td>AAN Annual Meeting (4/17-4/23 @ San Francisco)</td>
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<td>7:00</td>
<td>IOM Education Session</td>
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<td>4/27/21</td>
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<tr>
<td>5/4/21</td>
<td>7:00</td>
<td>Spinal Muscular Atrophy</td>
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<td>5/4/21</td>
<td>7:30</td>
<td>Spinal Muscular Atrophy</td>
<td>Dimachkie</td>
</tr>
<tr>
<td>5/11/21</td>
<td>7:00</td>
<td>Pediatric Muscular Dystrophies</td>
<td>Statland</td>
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<tr>
<td>5/11/21</td>
<td>7:30</td>
<td>Pediatric Muscular Dystrophies</td>
<td>Statland</td>
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<tr>
<td>5/18/21</td>
<td>7:00</td>
<td>Neurologic Complications of Vitamin B12 Deficiency</td>
<td>FELLOW/Pasnoor</td>
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<tr>
<td>5/18/21</td>
<td>7:30</td>
<td>Neurologic Complications of Vitamin B12 Deficiency</td>
<td>FELLOW/Pasnoor</td>
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<td>5/25/21</td>
<td>7:00</td>
<td>IOM Education Session</td>
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<tr>
<td>6/1/21</td>
<td>7:00</td>
<td>Metabolic Myopathy Evaluation</td>
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<td>6/1/21</td>
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<td>Statland</td>
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<td>6/8/21</td>
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<td>6/22/21</td>
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<td>No Lecture</td>
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<td>6/22/21</td>
<td>7:30</td>
<td>Coding &amp; Billing</td>
<td>Teferra</td>
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<td>6/29/21</td>
<td>7:00</td>
<td>IOM Education Session</td>
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<td>7:30</td>
<td>No Lecture</td>
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WORK HOURS

Work hours are defined as all clinical and academic activities related to the residency program, i.e., patient care (both inpatient and outpatient), administrative duties related to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled academic activities such as conferences. Work hours do not include reading and preparation time spent away from the duty site. Work hours are limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities.

Residents are provided with one day in seven free from all educational and clinical responsibilities, averaged over a four-week period, inclusive of call. One day is defined as one continuous 24-hour period free from all clinical, educational and administrative activities.

Adequate time for rest and personal activities must be provided. This should consist of an eight-hour time provided between all daily work periods and at least 14 hours after in-house call.

The institutional policy on work hours is detailed in the Policy and Procedure Manual Governing Graduate Medical Education at the University of Kansas School of Medicine.

HAND-OFF POLICY

It is important to have, for patient safety and continuity of care, a solid transition of case performance for any absence and at the end of each of the three rotations.

Transitions in care are difficult. Every effort must be made by our fellows for smooth transitions in care. The key elements in care transitions are:

- The patient knows who is providing care for them at the fellow and at the faculty levels
  - The fellows introduce themselves to the patient when they first meet and when another fellow takes over
  - The faculty introduce themselves to the patient when they first meet
- Service hand-off is handled in person and in writing at the end of each rotation and during absences
- The fellow checks out daily to the service resident. At the end of the day, the fellows may also check out to the on-call resident if need be on a case by case basis
- The hand-off has the pertinent demography information, urgent test results to be followed up, and current treatment. It is preferred that this be kept electronically and then wiped from memory. If a paper copy is used, it must be placed in a shred box when done
FELLOWS CALL DUTIES

There is no in-house call. The institutional policy on work hours is detailed in the Policy and Procedure Manual Governing Graduate Medical Education at the University of Kansas School of Medicine.

LIBRARY AND FELLOW OFFICES

Fellows have access to the Dykes Medical Library, within brief walking distance. Library services also include on-site electronic retrieval from medical databases. There is on-site access to textbooks and journals through the neurophysiology laboratories as well as the Department of Neurology’s Ziegler Library. These are available during nights and weekends as well. Computer access for fellows to perform journal searches is available in the clinics, neurophysiology laboratories, and in the resident office of the Department of Neurology (PC with online access, desks, designated patient contact computer, phone with voice mail).

DAILY PATIENT LIST/PATIENT ENCOUNTER DOCUMENTATION

Fellows are required to maintain a Patient Encounter Log. Booklets and actual report copies allow fellows to document patient demographics, diagnoses, hospital or clinic setting. Fellows must provide a copy of their patient logs to the Program Coordinator at least quarterly for record retention.

MEDICAL RECORDS GENERATION AND DICTATION

Fellows are responsible for the dictation and/or completion of all patient reports on the day of service for all cases in which he/she has participated. Medical records must be completed in a timely fashion on the same day of interaction. This includes clinic visits as well as EMG studies.

EVALUATIONS

Fellows are required to evaluate each faculty member and the rotations monthly. Fellows evaluate the program and perform a 360° evaluation every six months. We do our best to maintain fellow anonymity. Candid feedback is strongly encouraged. Strength and weakness analysis are also requested.

The performance of the faculty must be evaluated by the program no less frequently than at the midpoint of the accreditation cycle, and again prior to the next site visit. The evaluations should include a review of their teaching abilities, commitment to the educational program, clinical knowledge, and scholarly activities. This evaluation must include written confidential evaluations by the residents.
FELLOW EVALUATIONS

Faculty members evaluate fellows bi-monthly. Evaluations include judging the fellow’s knowledge, basic clinical competence, both general skills in the primary specialty and specific technical skills, overall performance, the development of professional attitudes consistent with being a physician, ethical behavior and professionalism. The Program Director will review evaluations with the fellow on a quarterly basis. The summary and final evaluation of the resident in neuromuscular medicine will be prepared by the Program Director of the Neuromuscular Medicine training program and will reflect the periodic evaluation by all teaching faculty and is signed by the fellow. These may be reviewed upon request. Each fellow is required to be proficient in the clinical and technical skills determined to be necessary for a neuromuscular medicine specialist and any related standards relevant to neurology. Advancement to positions of higher responsibility is in accordance to performance. A permanent record is kept of the final evaluations.

MILESTONES

Outcomes based milestones have been developed as a framework for determining resident and fellow performance within the six ACGME core competencies. Each milestone is a competency based developmental outcome that can be demonstrated progressively by residents and fellows from the beginning of their education through graduation to the unsupervised practice of their specialties.

For program accreditation, milestones allow for continuous monitoring of programs, provide public accountability by reporting on aggregate competency outcomes by specialty at a national level and focus on continuous improvement of graduate medical education. For the educational program, milestones provide a framework for clinical competency committees, guide curriculum development, support better assessment practices, and enhance opportunities for early identification of struggling residents and fellows. For the residents and fellows, milestones provide more explicit and transparent expectations of performance, support better self-directed assessment and learning, and facilitate better feedback for professional development.

EXAMS

Fellows are required to sit for two multiple-choice written examinations. The Neuromuscular Medicine in-service examination measures knowledge in the evaluation and management of patients with neuromuscular medicine disorders. EMG and neuromuscular knowledge are also tested through an American Board of Electrodiagnostic Medicine written examination (AANEM). There will be a post-examination review. This series of examinations will assist faculty and fellows in gauging fellow medical knowledge and application of basic sciences.

Throughout the year, fellow investigatory and analytic thinking of medical knowledge will be evaluated at the bedside using an oral examination on randomly selected cases. The fellow addresses a clinical problem relating to a patient case scenario and the examiner asks the fellow to manage the case. Fellows should
anticipate being asked questions about the reasons for the clinical findings, interpretation of clinical
findings, and the treatment plan. These brief (< 5 minute) sessions will total at least 90 minutes per
evaluation interval. Performance on the oral examination will be reflected in the periodic evaluation by the
Program Director and will be verbally discussed with the fellow.

FELLOWSHIP COORDINATING COMMITTEE

The Director of the Neuromuscular Medicine fellowship program, Dr. Mazen M. Dimachkie, chairs the
Fellowship Coordinating Committee (FCC) meeting which includes the faculty as well as the fellow and the
fellowship coordinator. The FCC convenes at least three times a year to address policies and administrative
matters. The teaching staff and fellows meet periodically to evaluate the utilization of resources available
to the program, the contribution of each institution participating in the program, the financial and
administrative support of the program, the volume and variety of patients available to the program for
educational purposes, the performance of members of the teaching staff, and the quality of supervision of
residents. Dr. Dimachkie also reviews cumulative fellow performance individually at least twice a year and
anonymous faculty evaluations.

At the end of the year meeting, the FCC reviews the fellow evaluation of the program, fellow performance
on metric tests (see EXAMS section above), and new regulatory policies as promulgated by the sponsoring
institution and the ACGME RRC. The FCC discusses and votes on changes to the curriculum to continually
improve on and maintain the excellence of the program and submits a yearly APE Outcomes Report to the
GME.

CLINICAL COMPETENCY COMMITTEE

A Clinical Competency Committee (CCC) has been established under the ACGME guidelines to provide a
process for early identification of residents who are having difficulties. To this end the CCC, composed of
no less than three members of the program faculty, meets at least twice a year to use the neuromuscular
medicine Milestones to achieve a more objective assessment of each resident, to get better feedback,
earlier detection of a resident having difficulty, and earlier intervention and remediation when necessary.

The purpose of the CCC is to review all resident evaluations at least semi-annually, to prepare and assure
the reporting of Milestones evaluations of each resident semi-annually to the ACGME, and to advise the
program director regarding resident progress, including promotion, remediation and dismissal.

PROGRAM EVALUATION COMMITTEE

The Program Evaluation Committee (PEC), composed of at least two faculty members and one resident, is
appointed by the program director and actively participates in planning, developing, implementing and
evaluating the educational activities of the program. The program monitors and tracks resident
performance, faculty development, graduate performance (including performance on certification examinations), and program quality. Faculty and residents are given the opportunity to confidentially evaluate the program, in writing, annually. These results, along with progress on the previous year’s action plans, are used to track ongoing program improvements and help document progress for the Self-Study visits required by the ACGME.

RESPONSIBILITIES TO RESIDENT EDUCATION

Fellows are responsible for actively teaching and supervising neurology residents rotating on Neuromuscular Medicine. Fellows should cover the basics of neuromuscular medicine at the start of the rotation. Fellows instruct residents on required conferences and expectations. Moreover, fellows and residents must set aside time throughout the month to review neuromuscular medicine case studies. This is a learning experience for the residents and fellows, so feedback and constructive criticism is mandatory throughout the month. If problems arise that cannot be resolved between the fellow and resident, they should be brought to the attention of the Program Director.

PROMOTIONAL GUIDELINES

Neuromuscular Medicine training is a one-year program with progressively increased fellow responsibility. Neuromuscular medicine fellows are supervised in their responsibilities by faculty who allow the fellows to evaluate and treat patients under close supervision, with faculty always in attendance. As their competence increase according to the milestones, fellows are given increasing degrees of independence in patient evaluation and management. By the end of the year, neuromuscular medicine fellows can function independently and competently. Failure to satisfactorily complete the rotations will lead to formal counseling sessions and a sequence of disciplinary actions that may lead to probation and subsequent dismissal from the program. Disciplinary action will be administered in accordance with the Policy and Procedure Manual Governing Graduate Medical Education at the University of Kansas School of Medicine (Section 10) and in compliance with ACGME guidelines. Promotion to the next fellow year, for the interested candidate, is dependent on satisfactory completion of the rotations with favorable faculty evaluations (see Fellow Evaluations).

ACADEMIC DISCIPLINE

Fellow evaluations, in addition to the annual AANEM and Neuromuscular Medicine in-service examinations, will be used to monitor a fellow’s progress and performance. Occasionally, it is necessary to counsel a fellow regarding their weaknesses and problem areas to address these issues early. Failure to rectify problems may lead to a formal sequence of disciplinary actions, which can lead to probation or dismissal from the program. Disciplinary action will be administered according to the Policy and Procedure Manual Governing Graduate Medical Education at the University of Kansas School of Medicine (Section 12).
Fair procedures for academic discipline and resident complaints or grievances are in accordance with institutional policies. The Program Director is responsible for monitoring resident stress, including mental or emotional conditions inhibiting performance or learning and drug- or alcohol-related dysfunction. The Program Director and teaching staff will be sensitive to the need for timely provision of confidential counseling and psychological support services to residents. Training situations that consistently produce undesirable stress on fellows will be evaluated and modified.

**FELLOW STIPENDS**

All residents in ACGME accredited programs must receive stipends as prescribed in the Resident Agreement and the Policies and Procedures Governing Graduate Medical Education. All residents at a given postgraduate year level of training will receive the same stipend. The base stipend is determined by the resident’s PGY level and is set during the state government’s annual budgetary process. Stipends are subject to yearly revision, and all residents will be granted revised stipends appropriate for their PGY level when and if such revisions are made effective.

**LEAVE POLICY**

All requests for any form of leave (vacation, professional, sick, funeral, leave of absence, FMLA, etc.) must be approved by the Program Director in accordance with applicable state and federal laws and accreditation requirements. For more details, please refer to the Policy and Procedure Manual Governing Graduate Medical Education at the University of Kansas School of Medicine (Section 5.5). Fellows are required to complete a request form for absence when planning any leave including vacation or professional leave (to attend meetings). The fellow must complete the absence form, get the signatures from the supervising faculty and Program Director and turn them in to the Program Coordinator at least 30 days in advance. The fellow should notify, in writing, affected faculty members of their absence at least 30 days in advance. Further questions should be addressed to the Program Director.

The program will provide up to a maximum of three weeks (15 working days) of vacation per contract year, which is covered by the resident stipend.

Vacation must be requested from, and approved by, the Program Director or a designee in advance in a manner proscribed by the program. Denial of a specific request for vacation is a management decision on the part of program and is not a grievable matter.

The University will provide up to ten workdays of sick leave per year, covered by the resident’s stipend, to cover personal illness or illness in the resident’s immediate family (spouse, parents or children). The use of sick leave must be approved by the Program Director or the Department Chair. At the discretion of the Chair or Program Director, a physician’s written statement may be required as a condition of approval for sick leave. The University may also require a certification that the resident is released to return to work following three more consecutive days of absence resulting from the resident’s own illness.
Paid leave, (e.g., vacation, sick) cannot be accumulated or carried over from contract year to contract year.

A resident eligible for FMLA leave may request FMLA designation pursuant to the University’s FMLA policy for up to twelve weeks of leave per academic year or contract year (please refer to Section 5 of the GME Policy and Procedure Manual for details).

A resident who does not qualify for FMLA or who has used the maximum amount of FMLA for the year but who still requires relief from the responsibilities of the program, may request a Leave of Absence (please refer to Section 5 of the GME Policy and Procedure Manual for details).

RESIDENT ASSISTANCE AND ACCESS TO COUNSELING

The University is interested in the health and well-being of all residents and aids those with personal problems involving alcohol, drugs, family, marriage, financial, emotional or other conditions that may interfere with work attendance, productivity, and the ability to get along with co-workers. The Employee and Student Assistance Program is designed to provide information, assessment and referral services to help faculty, staff, residents and students identify problems and develop lifestyles that are physically and emotionally healthy (please refer to Section 18 of the GME Policy and Procedure Manual for details). GME provides funding so residents/fellow do not pay a fee or use their health insurance for these appointments. KUMC Counseling & Educational Support Services is located in G116 Student Center and G011 Dykes (Writing). More information may be found at https://www.kumc.edu/counseling. To schedule an appointment, residents/fellows may call (913) 588-6580 or schedule online at https://medconsult.kumc.edu.

BENEFITS

All residents in ACGME accredited program must receive benefits as prescribed in the Policies and Procedures Governing Graduate Medical Education. All residents are given the following benefits (please refer to Section 5 of the GME Policy and Procedure Manual for details):

1. **Health, Dental and Vision Insurance and Flexible Spending and Health Savings Account**
   House staff and their families are eligible for the State of Kansas Employee’s Group Health, Dental and Vision Insurance and Flexible Spending and Health Savings Account. Coverage begins the first day of the month following the first 30 days of employment. Premiums are deducted from the paycheck.

2. **Professional Liability Insurance**
   Kansas Statutes Annotated (KSA 40-3401 et seq) provides professional liability coverage and tail coverage for residents for acts committed while carrying out their program responsibilities in the amounts of $1,000,000 per occurrence and $3,000,000 annual aggregate. Tail coverage assures
that, even after residents and fellows have completed their training at KUMC, any claims brought as a result of those training activities will continue to be covered by their resident/fellow policy.

3. **Worker’s Compensation**
   Through the Kansas Self-Insurance Fund, benefits are provided to residents and fellows who are injured performing their job duties.

4. **ACLS, PALS, NRP or ATLS Training**
   Residents are provided initial certification fees (including books) for ACLS, PALS, NRP or ATLS certification. Programs are responsible for renewal costs during the course of the residency program. However, charges assessed for residents who do not attend their scheduled sessions, or for repeat classes after failing a certification course, are the responsibility of the resident.

5. **Pagers/VOALTE/Phones**
   Pagers are provided at no cost. Charges may be assessed if pagers are lost or damaged. Residents must acquire and/or use in performance of their duties, a personal smart phone that meets University of Kansas Hospital’s technical requirements. Residents receive a smart phone stipend, the amount of which is determined and communicated to residents on a yearly basis.

6. **Parking**
   Fellows are provided parking in P5 as part of the Standardized Benefits package.

7. **White Coats**
   Programs are provided a stipend for resident White Coats as part of the Standardized Benefits.

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**TRAVEL PROCEDURES**

The Program Director, in consultation with the department chairman, will base financial support for travel of fellows who are presenting at the Carrell-Krusen Symposium and/or the American Academy of Neurology annual meeting. Travel of fellows who are not presenting at these meetings will not be reimbursed. All travel for reimbursement must have written pre-approval by Dr. Dimachkie at least six weeks before departure date. Fellows need permission by Dr. Dimachkie for travel, and fellows must complete an absence from at least one month in advance. Expenses will be reimbursed according to KU policy which requires original receipts for reimbursement. The fellow will notify, in writing, faculty members affected by their absence. This should be done 30 days in advance. Questions should be addressed to the Program Director. Reimbursement beyond the limit of $1,500 is subject to fund availability as assessed by the Program Director.

For international travel, fellows should consult at least two months in advance with the Office of International Programs (Kimberly Connelly or Irina Aris). Please refer to Section 21 of the GME Policy and Procedure Manual for guidelines on international travel.
HOLIDAYS

The Neuromuscular Medicine program and the Department of Neurology at the University of Kansas Medical Center observe eight holidays each academic year. These holidays are as follows:

- Independence Day
- Labor Day
- Thanksgiving Day
- The day after Thanksgiving
- Christmas Day
- New Year’s Day
- Martin Luther King Day
- Memorial Day

MOONLIGHTING POLICY

Professional activities outside the program (moonlighting) are generally discouraged. Fellows are not required to engage in moonlighting. If a fellow chooses to moonlight, the time spent in doing so must be personal free time away from the training program. The moonlighting workload must not interfere with the ability of the fellow to achieve the goals and objectives of the training program. Time spent by fellows in internal and external moonlighting must be counted towards the 80-hour maximum weekly work hour limit. The Program Director will monitor fellow performance to assure that factors such as fatigue are not contributing to diminished learning or performance or detracting from patient safety. Under the institutional requirements, there must be written acknowledgement by the Program Director, the Department Chair, and the Associate Dean for Graduate Medical Education that a fellow is engaged in moonlighting. The acknowledgement will be kept in the fellow’s file. All fellows engaged in moonlighting must be licensed for unsupervised medical practice in the state where the moonlighting occurs. It is the responsibility of the institution hiring the fellow to moonlight to determine whether such licensure is in place, adequate liability coverage is provided, and whether the resident has the appropriate training and skills to carry out assigned duties. For more details, please consult Section 16 of the GME Policy and Procedure Manual.
2020-2021 Academic Year
Timothy Fullam
Nathan McGraw

2019-2020 Academic Year
Swathy Chandrashekhar
David Shirilla

2018-2019 Academic Year
Matthew Varon

2017-2018 Academic Year
Anai Hamasaki

2016-2017 Academic Year
No fellow

2015-2016 Academic Year
No fellow

2014-2015 Academic Year
Duaa Jabari

2013-2014 Academic Year
Ahmad Abuzinadah
Omar Jawdat

2012-2013 Academic Year
Maryam Tahmasbi Sohi

2011-2012 Academic Year
Iryna Muzyka

2010-2011 Academic Year
Bachir Estephan Dajda

2009-2010 Academic Year
No fellow

2008-2009 Academic Year
Faisal Raja
CLINICAL NEUROPHYSIOLOGY ALUMNI

2020-2021 Academic Year
Mohammed Rahman

2019-2020 Academic Year
Chaitanya Amrutkar
Prompan Mingbunjerdsuk

2018-2019 Academic Year
Siva Pesala
David Shirilla

2017-2018 Academic Year
Ernesto Alonso
Tekalign Burka
Bhavana Sharma

2016-2017 Academic Year
Anai Hamasaki
Daniel Kimple
Robert Murphy

2015-2016 Academic Year
Karthika Veerapaneni

2014-2015 Academic Year
Ahmad Abuzinadah
Kim Johnson
Tara Quesnell

2013-2014 Academic Year
Dipika Aggarwal
Lipika Nayak

2012-2013 Academic Year
Brennen Bittel
Behrouz Zamani Fekri

2011-2012 Academic Year
No fellow

2010-2011 Academic Year
Iryna Muzyka
Remia Paduga

2009-2010 Academic Year
Dobrin Dobrev
Samiullah Kundi
Samir Macwan

2008-2009 Academic Year
Farhan Ahmed
Srinivas Bandi

2007-2008 Academic Year
Ziad Haddad
Faisal Raja
James Southwell

2006-2007 Academic Year
Dan Dimitru
Gary Miller
Kazi Syed

2005-2006 Academic Year
Saud Khan
Reddiah Mummaneni
Mamatha Pasnoor

2004-2005 Academic Year
Sarah Alseoudi
Heather Anderson
Ijaz Rashid

2003-2004 Academic Year
Sanjeev Kumar
Yunxia Wang

2002-2003 Academic Year
Hazem Ali
Blanca Marky
Christopher Milford

2001-2002 Academic Year
Ziad El-Chami
Haidar Kabbani
Gary Lian

2000-2001 Academic Year
Francis Obi Okonkwo-Onuigo
NEUROMUSCULAR MEDICINE FACULTY

Swathy Chandrashekar, MD  
Assistant Professor, Department of Neurology  
Neuromuscular Disease

Richard Dubinsky, MD, MPH  
Professor, Department of Neurology  
Vice Chair, Outpatient Neurology  
EMG/Movement Disorders/Research/Chemodenervation

Mazen M. Dimachkie, MD  
Professor, Department of Neurology  
Program Director, Neuromuscular Medicine Fellowship  
Director, Neuromuscular Division  
Executive Vice Chair, Neurology  
EMG/Neuromuscular Disease/Research/Pathology

Constantine Farmakidis, MD  
Assistant Professor, Department of Neurology  
EMG/Neuromuscular Disease/Research

Duaa Jabari, MD  
Assistant Professor, Department of Neurology  
EMG/Neuromuscular Disease/Pathology/Research

Omar Jawdat, MD  
Associate Professor, Department of Neurology  
ALSA Clinic Director  
EMG/Neuromuscular Disease/ALSA/Rehabilitation/Research/Pathology/Neuromuscular Ultrasound

Mamatha Pasnoor, MD  
Professor, Department of Neurology  
Program Director, Clinical Neurophysiology Fellowship  
Associate Program Director, Neuromuscular Medicine Fellowship  
Program Director, Neurology Residency Program  
Co-Director, University of Kansas Neuropathy Center  
EMG/Neuromuscular Disease/Research/Pathology

Jeff Statland, MD  
Associate Professor, Department of Neurology  
Neuromuscular Disease  
Co-Director, Adult MDA Clinic  
Co-Director, Pediatric MDA Clinic  
Neuromuscular Disease/ALSA/Research/Rehabilitation