

# The American Board of Psychiatry and Neurology Neuromuscular Medicine Core Competencies Outline

## I. Neuromuscular Patient Care Core Competencies

A. GENERAL: Neuromuscular Medicine Specialists shall demonstrate the following abilities:

1. To perform and document relevant history and examination of culturally diverse patient to include as appropriate:
  - a. Chief complaint
  - b. History of present illness
  - c. Medical history
  - d. Developmental history (especially for children)
  - e. Comprehensive review of both neurologic and general systems
  - f. Biological family history
  - g. Sociocultural history
  - h. Neurological examination and a germane general examination as appropriate to the present illness
2. Delineate appropriate differential diagnoses
3. Formulate, assess, and recommend effective management

B. FOR NEUROMUSCULAR MEDICINE: Based on comprehensive neurological assessments, Neuromuscular Specialists shall demonstrate the following abilities:

1. To determine:
  - a. If a patient's symptoms are the result of a disease affecting the central and/or peripheral nervous system or are of another origin (e.g., of a systemic, psychiatric, or psychogenic illness) by performing appropriate neuromuscular evaluation
  - b. An initial diagnostic formulation with differential diagnosis
  - c. Appropriate diagnostic modalities to include laboratory blood, urine, and cerebrospinal fluid analyses, electrodiagnostic, imaging, genetic, and pathologic investigations to evaluate and manage such patients
  - d. Management plan
2. To develop and maintain the technical skills to:
  - a. Perform and/or interpret clinical electrodiagnostic testing, peripheral nerve and muscle biopsy, ischemic lactate testing, edrophonium testing, and molecular genetic testing as appropriate to the various inherited neuromuscular disorders
  - b. Identify and differentiate the various neurological disorders localized to the peripheral motor and sensory units
  - c. Evaluate the application and relevance of investigative procedures as defined by these various diagnostic entities and their interpretation in the

- diagnosis of the specific neuromuscular disorders
- d. Identify and describe the gross and microscopic pathologic findings necessary to diagnose the various peripheral sensory / motor nerve and myopathic neuromuscular disorders
- e. Understand the primary genetic bases for and determinants underlying the heritable, inborn neuromuscular disorders
- 3. To recognize and treat neuromuscular disorders, including those at all major levels of the motor unit i.e.:
  - a. Motor Neuron
  - b. Nerve root & plexus
  - c. Mononeuropathies
  - d. Peripheral Neuropathies including mononeuritis multiplex
  - e. Autonomic nervous system
  - f. Neuromuscular junction
  - g. Muscle
  - h. Special situations: Critical care; Pediatrics

## **II. Neuromuscular Medicine Medical Knowledge Core Competencies:**

- A. GENERAL: Neuromuscular medicine specialists shall demonstrate the following:
  - 1. Comprehensive knowledge of the motor neuromuscular disorders, including considerations relating to age, gender, race, and ethnicity as based on the literature and practice guidelines. This knowledge shall include:
    - a. Epidemiology of the disorder
    - b. Etiology, including medical, genetic, and sociocultural factors
    - c. Clinical phenomenology
    - d. Appreciation of the impact of the specific physical disorder on the patient's activities of daily living
    - e. The experience, meaning, and explanation of the illness for the patient and family including the influence of cultural factors and culture-bound syndromes
    - f. Available pharmacologic modalities and rehabilitative strategies
    - g. Course and prognosis
  - 2. Knowledge of healthcare delivery systems, including patient and family counseling
  - 3. Application of ethical principles to all phases of the medical care
  - 4. Ability to reference and utilize electronic systems to access medical, scientific and patient information
- B. NEUROMUSCULAR MEDICINE: Specialists shall demonstrate knowledge of the following in adults and children:
  - 1. Basic neuroscience and pathophysiology that is critical to the practice of

neuromuscular medicine: Normal constituents of the peripheral and autonomic nervous system and the various neuromuscular disorders, including:

- a. Neuroanatomy: Gross anatomy
  - 1) Anterior horn cell
  - 2) Cervical, thoracic, lumbar, sacral roots
  - 3) Brachial & lumbosacral plexus
  - 4) Peripheral nerves, sensory and motor
  - 5) Skeletal muscle
- b. Neuroanatomy: Microanatomy
  - 1) Anterior horn cell microanatomy and histology
  - 2) Peripheral & autonomic nerve microanatomy and histology
  - 3) Neuromuscular junction microanatomy and histology
  - 4) Skeletal muscle microanatomy and histology
- c. Physiology: Basic
  - 1) Cellular physiology
  - 2) Physiologic properties of peripheral nerve and the mechanism of nerve conduction (sensory and motor)
  - 3) Muscle physiology
  - 4) Neuromuscular junction physiology (e.g., generation of muscle action potential)
- d. Physiology: Clinical
  - 1) Kinesiology of all major muscle groups
- e. Neuroimmunology: Basic components of immune responsiveness
  - 1) Antibody formation
  - 2) Role of complement, cytokines
  - 3) Lymphocyte populations & role in immune mediated diseases
- f. Neurogenetics
  - 1) Genetic mechanisms of disease
  - 2) Inheritance patterns
- g. Neuromuscular pathology
  - 1) Salient light and electron microscopic features of peripheral nerve & muscle diseases
- h. Pharmacology
  - 1) Pharmacologic mechanisms of drug metabolism
  - 2) Effects and side effects of therapies in neuromuscular diseases
  - 3) Recognition of drug therapies that produce neuromuscular side effects
2. Diagnostic modalities (including developing and maintaining technical skills to perform and/or interpret normal and abnormal findings and clinical correlations as appropriate in the following disorders):
  - Motor neuron
  - Radiculopathies
  - Plexopathies

- Mononeuropathies including the cranial neuropathies
  - Polyneuropathies symmetric, asymmetric
  - Autonomic
  - Neuromuscular junction disorders
  - Myopathies
- a. Electromyography (EMG): Nerve conduction studies (NCS), repetitive nerve conduction studies, blink reflex, needle EMG, single fiber EMG, and autonomic testing
    - 1) Methods
      - a) Anatomy
      - b) Techniques: NCS, EMG, other
    - 2) Basic patterns: NCS, EMG, repetitive stimulation, artifacts
    - 3) Clinical correlations
      - a) Peripheral nerve disease, focal, diffuse, autonomic
      - b) Cranial nerve disorders of V, VII, XI
      - c) Central disease: motor neuron, cord, brainstem
      - d) Neuromuscular junction disease
      - e) Muscle disease
      - f) Pediatric disorders
      - g) Patterns: prognosis, evolution of disease
    - b. Neuropathology: muscle and nerve biopsy
    - c. Immunologic testing
    - d. Molecular genetic analysis
  3. Therapeutic modalities
    - a. Acute and chronic pharmacologic in
      - 1) Motor neuron disorders
      - 2) Radiculopathies
      - 3) Plexopathies
      - 4) Mononeuropathies including cranial neuropathies
      - 5) Peripheral neuropathies
        - a) Polyneuropathy and polyradiculopathy (e.g., heritable disorders, systemic disease, toxins, drugs, infectious, post-infectious, paraneoplastic genetic)
        - b) Mononeuritis multiplex
      - 6) Neuromuscular junction disorders
        - a) Pre-synaptic (Lambert-Eaton myasthenic syndrome, botulism)
        - b) Post-synaptic (myasthenia gravis)
        - c) Congenital myasthenic syndromes
      - 7) Myopathies
        - a) Congenital myopathies
        - b) Inherited myopathies
        - c) Acquired myopathies
    - b. Rehabilitation modalities applicable to chronic neuromuscular disorders

- 1) Exercise
  - 2) Assistive devices
  - 3) Assistive technology
  - 4) Braces
  - 5) Physical therapy/occupational therapy
  - 6) Pulmonary therapy
  - 7) Speech/swallowing therapy
  - 8) Nutritional management
- c. Long-term and end-of-life counseling

### **III. Interpersonal and Communications Skills Core Competencies**

- A. Neuromuscular medicine specialists shall demonstrate the following abilities:
1. To listen to and understand patients and to attend to nonverbal communication
  2. To communicate effectively with patients using verbal, nonverbal, and written skills as appropriate
  3. To develop and maintain a therapeutic alliance with patients by instilling feelings of trust, honesty, openness, rapport, and comfort in the relationship with physicians
  4. To partner with patients to develop an agreed upon healthcare management plan
  5. To transmit information to patients in a clear and meaningful fashion
  6. To understand the impact of Neuromuscular Medicine Specialists' own feelings and behavior so that these do not interfere with appropriate treatment
  7. To communicate effectively and work collaboratively with allied healthcare professionals and with other professionals involved in the lives of patients and families
  8. To educate patients, families, and other health care professionals about medical, psychosocial, and behavioral issues
- B. Neuromuscular Medicine Specialists shall obtain, interpret, and evaluate consultations from other medical specialties. This shall include:
1. Having sensitivity to assess the need for consultation, and knowing when to solicit consultation
  2. Formulating and clearly communicating the consultation questions
  3. Discussing the consultation findings with the consultant
  4. Discussing the consultation findings with patient and family
- C. Neuromuscular Medicine Specialists shall serve as effective consultants to other medical specialists, mental health professionals, and community agencies by demonstrating the abilities to:

1. Communicate effectively with the requesting party to refine the consultation question
  2. Maintain the role of consultant
  3. Communicate clear and specific recommendations
  4. Respect the knowledge and expertise of the requesting professionals
  5. Provide timely access to consultation, especially in emergency situations and in patients with critical illness
- D. Neuromuscular Medicine Specialists shall communicate effectively with patients and their families by:
1. Gearing all communication to the educational and intellectual levels of patients and their families
  2. Demonstrating sociocultural sensitivity to patients and their families
  3. Providing explanations of psychiatric and neurological disorders and treatment that are jargon-free and geared to the educational/intellectual levels of patients and their families
  4. Providing preventive education that is understandable and practical
  5. Respecting the patients' cultural, ethnic, religious, and economic backgrounds
  6. Developing and enhancing rapport and a working alliance with patients and their families
  7. Ensuring that the patient and/or family have understood the communication
- E. Neuromuscular Medicine Specialists shall maintain up-to-date medical records and write legible prescriptions and other orders. These records must capture essential information while simultaneously respecting patient privacy, and they must be useful to health professionals outside neurology and psychiatry. Provide timely and clinically useful reports of diagnostic testing, using language that is understandable to referring care providers.
- F. Neuromuscular Medicine Specialists shall lead a multidisciplinary treatment team, including being able to:
1. Listen effectively
  2. Elicit needed information from team members
  3. Integrate information from different disciplines
  4. Manage conflict
  5. Clearly communicate an integrated treatment plan
  6. Communicate effectively with and provide structured supervision and training of personnel
  7. Promote a collegial relationship among all personnel, including technicians and/or trainees
- G. Neuromuscular Medicine Specialist shall communicate effectively with patients and their families while respecting confidentiality. Such communication may include:

1. The results of assessment
2. Use of informed consent when considering investigative procedures
3. Genetic counseling and palliative care when appropriate
4. Use of consideration and compassion for all patient in providing accurate medical information and prognosis
5. The risks and benefits of the proposed treatment plan, including possible side- effects of medications and/or complications of nonpharmacologic treatments
6. Alternative (if any) to the proposed treatment plan
7. Appropriate education concerning the disorder, its' prognosis, and prevention strategies

#### **IV. Neuromuscular Medicine Practice-Based Learning and Improvement Core Competencies**

- A. Neuromuscular Medicine Specialists shall recognize limitations in their own knowledge base and clinical skills and understand and address the need for lifelong learning.
- B. Neuromuscular Medicine Specialists shall demonstrate appropriate skills for obtaining and evaluating up-to-date information from scientific and practice literature and other sources to assist in the quality care of patients. These shall include, but not be limited to:
  1. Use of medical libraries
  2. Use of information technology, including Internet-based searches and literature databases (e.g., Medline)
  3. Use of drug information databases
  4. Active participation, as appropriate, in educational courses, conferences and other organized educational activities both at the local and national levels
- C. Neuromuscular Medicine Specialists shall evaluate caseload and practice experience in a systematic manner. This may include:
  1. Case-based learning
  2. Use of best practices through practice guidelines or clinical pathways
  3. The review of patient records
  4. Obtaining appropriate supervision and consultation
  5. Maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors
- D. Neuromuscular Medicine Specialists shall demonstrate an ability to critically evaluate relevant medical literature. This ability may include:
  1. Using knowledge of common methodologies employed in neurological research
  2. Researching and summarizing a particular problem that derives from their own caseloads

- E. Neuromuscular Medicine Specialists shall demonstrate the ability:
1. To review and critically assess scientific literature to determine how quality of care can be improved in relation to one's practice (e.g., reliable and valid assessment techniques, treatment approaches with established effectiveness, practice parameter adherence). Within this aim, neuromuscular medicine specialists shall be able to assess the generalizability or applicability of research findings to one's patients in relation to their sociodemographic and clinical characteristics.
  2. To develop and pursue effective remediation strategies that are based on critical review of the scientific literature
  3. To know and recognize the normal and abnormal findings of neuromuscular diagnostic studies in patients of all ages
  4. To appropriately use and interpret diagnostic tests in the evaluation of the patient's problem
  5. To recognize personal limitations and knowledge of performing and interpreting diagnostic tests and when to seek guidance
  6. To continue to develop medical knowledge and apply this knowledge to patient care

**V. Neuromuscular Medicine Professionalism Core Competencies**

- A. Neuromuscular Medicine Specialists shall demonstrate responsibility for their patients' care, including:
1. Responding to communication from patients and health professionals in a timely manner
  2. Establishing and communicating back-up arrangements, including how to seek emergent and urgent care when necessary
  3. Using medical records for appropriate documentation of the course of illness and its treatment
  4. Providing coverage if unavailable (e.g., when out of town or on vacation)
  5. Coordinating care with other members of the medical and/or multidisciplinary team
  6. Providing for continuity of care, including appropriate consultation, transfer, or referral if necessary
- B. Neuromuscular Medicine Specialists shall demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict of interest.
- C. Neuromuscular Medicine specialists shall demonstrate respect for patient's families and colleagues as persons, respecting ages, cultures, disabilities, ethnicities, genders, socioeconomic backgrounds, religious beliefs, political

- leanings, and sexual orientations.
- D. Neuromuscular Medicine Specialists shall demonstrate understanding of and sensitivity to end of life care and issues regarding provision of care.
  - E. Neuromuscular Medicine Specialists shall review their professional conduct and remediate when appropriate.
  - F. Neuromuscular Medicine Specialists shall participate in the review of the professional conduct of their colleagues.
  - G. Neuromuscular Medicine Specialists shall be aware of safety issues, including acknowledging and remediating medical errors, should they occur.

## **VI. Neuromuscular Medicine Systems-Based Practice Core Competencies**

- A. Neuromuscular Medicine Specialists shall have a working knowledge of the diverse systems involved in treating patients of all ages, and understand how to use the systems as part of a comprehensive system of care in general and as part of a comprehensive, individualized treatment plan. This will include the:
  - 1. Use of practice guidelines
  - 2. Ability to access community, national, and allied health professional resources that may enhance the quality of life of patients with chronic neurological illnesses
  - 3. Demonstration of the ability to lead and delegate authority to healthcare teams needed to provide comprehensive care for patients with neurological disease
  - 4. Demonstration of skills for the practice of ambulatory medicine, including time management, clinical scheduling, and efficient communication with referring physicians
  - 5. Use of appropriate consultation and referral mechanisms for the optimal clinical management of patients with complicated medical illness
  - 6. Demonstration of awareness of the importance of adequate cross-coverage
  - 7. Use of accurate medical data in communication with, and effective management of, patients
  - 8. Understanding the appropriate reasons for obtaining and performing a study and doing a study that is appropriate for the patient's problem
  - 9. Understanding of practice parameters, resources, costs of diagnostic procedures, and appropriate tests for the patient and their families
  - 10. Understanding ethical and legal implications of tests
  - 11. Understanding billing, coding, and documentation procedures
- B. In the community system, Neuromuscular Medicine Specialists shall:
  - 1. Recognize the limitation of healthcare resources and demonstrate the ability

- to act as advocates for patients within their sociocultural and financial constraints
2. Demonstrate knowledge of the legal aspects of neurological diseases as they impact patients and their families
  3. Demonstrate an understanding of risk management
- C. Neuromuscular Medicine Specialists shall demonstrate knowledge of and interact with managed health systems, including:
1. Participating in utilization review communications and, when appropriate, advocating for quality patient care
  2. Educating patients concerning such systems of care
- D. Neuromuscular Medicine Specialists shall demonstrate knowledge of community systems of care and assist patients to access appropriate care and other support services. This requires knowledge of treatment settings in the community including ambulatory, consulting, acute care, partial hospital, skilled care, rehabilitation, and substance abuse facilities; halfway houses; nursing homes and home care; and hospice organizations.
- E. Neuromuscular Medicine Specialists shall demonstrate knowledge of the organization of care in each relevant delivery setting and the ability to integrate the care of patients across such settings.

<sup>1</sup>Cultural diversity includes issues of race, gender, language, age, country of origin, sexual orientation, religious/spiritual beliefs, sociocultural class, educational/intellectual levels, and physical disability. Working with a culturally diverse population requires knowledge about cultural factors in the delivery of health care. For the purposes of this document, all patient and peer populations are to be considered culturally diverse.

<sup>2</sup>Regarding sociocultural issues, for the purposes of this document, “family” is defined as those having a biological or otherwise meaningful relationship with the patient. Such “significant others” are to be defined from the patient’s point of view.

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