Recommendations for Training Residents in Electrodiagnostic Medicine

Developing competency in the recognition, diagnosis, and management of neuromuscular (NM) diseases remains a critically important aspect of residency training in neurology and physical medicine and rehabilitation (PMR). With an explosion of new treatments for NM disorders, accurate diagnosis is key for allowing patients to receive appropriate treatments without delay. Electrodiagnostic (EDX) medicine studies, primarily needle electromyography (EMG) and nerve conduction studies (NCSs), are critical tools to diagnose many NM diseases. They are crucial to help differentiate between conditions that can mimic each other, and play an important role in management and prognosis.[1-4] These conditions may include myopathy, motor neuron diseases, neuromuscular junction disorders, polyradiculopathy, and advanced polyneuropathies. EDX testing is frequently necessary to assess and evaluate conditions that may appear to be neurologic but are eventually found to be musculoskeletal such as shoulder and hip disease, cervical and lumbosacral pain, fibromyalgia, stretch and tendon injuries, and tendon entrapments.

In a manuscript on neurology residency training published by the American Academy of Medicine in 2002, 28% of the neurology residents reported EDX training to be the most deficient subspecialty area of education in their neurology program. [5] In a paper published by Mahajan and colleagues in 2019, only 23% of adult neurology residents had confidence about performing or interpreting EDX studies independently.[6] Recently, some neurology programs have shortened exposure to EDX studies, in some cases from 3 months to 2 months, and in other instance to 2 weeks. For some neurology residencies, training in EDX is optional.

In light of these concerning trends in EDX clinical training, the American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM) has developed this position statement for minimum training in EDX for neurology and PMR residents. It is the position of the AANEM that neurology residents should be required to complete a minimum of 3 months training in EDX to competently perform and interpret basic studies. AANEM ideally recommends 5-6 months training (if possible) to meet the goal of performing and interpreting complex studies. It is recognized that the amount of time allocated to EDX instruction may vary depending on an institution's clinical volume. In neurology programs EDX teaching may occur in context of a neuromuscular medicine rotation, in which EDX complements the clinical diagnosis and management of neuromuscular disorders

AANEM also recommends the following:

• Uninterrupted EDX rotations provide the optimal training, and contiguous blocks are recommended over a fractured clinical experience. EDX training may be nested in other clinical experiences, preferably in related fields such as but not exclusive of neuromuscular medicine, orthopedics, or interventional pain.

•It is best if the training is placed in the PGY2 or first half of the PGY3 year so that clinical knowledge can be effectively applied during later rotations. It is noted that early exposure to EDX training may play an important role in decisions regarding fellowship training.

•The use of residents during the EDX rotation to cover other services should be kept to a minimum and, at best, not occur at all. If such is encountered it is recommended that programs re-deploy residents to other services (inclusive of time off for continuity clinic) no more than an average of 1 day per week over the duration of EDX exposure.

• Involvement in outpatient and inpatient neuromuscular consultations should be encouraged to augment training in neuromuscular conditions.

• Residents should be educated in the performance of NCSs by a multidisciplinary team which may include NCS technologists, experienced residents, neuromuscular and clinical neurophysiology fellows, as well as neurology and PMR faculty. This variety of teaching experts leads to a rich experience if proper supervision is incorporated into the educational experience. Exposure to multiple supervising faculty is encouraged, and trainees should have access to training in pediatric neuromuscular disorders and pediatric EMG.

• The minimum number of required (performed or observed) EDX studies by the Accreditation Council for Graduate Medical Education (ACGME) Review Committee for PMR is 200.[7] It is AANEM's position that, PMR residents should receive 5-6 months of exposure to EDX studies to achieve the requirements of the ACGME.

• To qualify for the American Board of Electrodiagnostic Medicine (ABEM) examination, candidates must receive 6 months of EDX training. To take the ABEM examination, residents and fellows must have exposure to EDX studies, diagnosis, evaluation, and treatment of neuromuscular disorders in children.

• It is recommended that residents should be required to demonstrate competency through a mechanism deemed appropriate by the institution such as using a written and/or oral examination before performing NCSs without direct supervision, noting that such supervision may be provided by a qualified technician, a senior resident, or a fellow. For ACGME, direct supervision means that the supervising personnel is physically present with the resident and the patient.

• When learning the needle examination, residents should be required to demonstrate competency performing a needle localization exam and then be directly supervised by attending physicians until competency is demonstrated in needle placement and basic interpretation. Remote review of needle exam recordings can allow for indirect supervision after a needle localization evaluation is completed. Subsequent to establishing competency in needle localization and interpretation, direct faculty supervision, as defined above, may be limited to key aspects of the study.

• Formal didactic lectures should be offered on NCSs, EMG, repetitive nerve stimulation, single fiber EMG, and autonomic testing. If neuromuscular ultrasound training is part of the experience in the EDX laboratory, didactic lectures on this topic should be part of the curriculum.

• While didactic lectures can be distributed throughout the year, it is noted that a specific curriculum delivered during the clinical experience will both enrich the EDX experience and reinforce the knowledge base.

• Neurology residents should be encouraged to pursue elective time in EDX to refine skills and reinforce knowledge.

• Residents should be encouraged to perform as many NCSs and EMGs as is feasible in the educational process and on as wide a variety of neuromuscular conditions as the EDX laboratory can provide.

• Review of nerve and muscle biopsy slides of patients with neuromuscular disorders with a skilled pathologist add value to the training of neurology residents during their rotation. PMR residents may benefit from didactic exposure to neuromuscular pathology.

More details about the required training can be found in the AANEM' Educational Guidelines for EDX Training Programs. https://www.aanem.org/getmedia/5e823212-b0f9-4218-b193-88a3c0e8c1c6/ED-guidelines-for-training-programs-2017.pdf. AANEM understands the demands facing neurology and PMR training programs and their directors in coordinating the broad education of residents within a 3 year program. However, reducing the training of residents in EDX procedures will have a negative impact on patient care.

AANEM urges the ACGME to require these minimal standards and for training programs to strive to exceed those standards. AANEM believes this is in the best interest of patient care.

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Position Statement History

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