

RESIDENCY AND POST-RESIDENCY EDUCATION OF THE GENERAL NEUROLOGIST

Ralph F. Józefowicz, MD
University of Rochester
Rochester, NY

Residency Education of the General Neurologist

According to the Accreditation Council for Graduate Medical Education (ACGME) program requirements for residency education in neurology, neurology is defined as a medical specialty concerned with the diagnosis and treatment of all categories of disease involving the central, peripheral and autonomic nervous systems, including their coverings, blood vessels, and all effector tissue, such as muscle. For these diseases, the neurologist is often the principle care physician, and may render all levels of care commensurate with his or her training.

A complete neurology residency requires 48 months of training, 36 months of which must be in neurology. How these 36 months of neurology training are structured often represents a compromise by the three different stakeholders: the Neurology department and faculty members, the Neurology residents and the Neurology Residency Review Committee (NRRC).

Neurology Department and Faculty

The Department of Neurology and its faculty primarily see a residency program as providing service needs for patient care. The residents play an integral role in running the Neurology inpatient service and consultation services, as well as staffing the intensive care unit. Clinical neurophysiology fellows play an important role in performing EMG's.

Education of medical students is another important role of Neurology residents. In most medical schools, 50% or more of medical student teaching is done by neurology residents, once again freeing up faculty time to pursue academic interests.

Research is a minor component of most residency programs. Quality research done by Neurology residents may add stature to a department's standing.

Neurology Residents

Neurology residents see education as the main goal of a residency training program. In particular, they expect to receive superior clinical training to allow them to function as neurologists in either the private or academic sector. They expect to be provided with a balanced educational program in Neurology, upon which they will continue to expand their knowledge base, as dictated by their ultimate career path.

Neurology residents also have a secondary goal for their residency training program, namely preparation for a fellowship. Approximately three-fourths of all Neurology residents pursue additional training in a subspecialty of neurology through a fellowship. Residents graduating from top-tier neurology residency programs are clearly more competitive for top-tier fellowship programs.

Neurology Residency Review Requirements

The Accreditation Council for Graduate Medical Education (ACGME) is a private, non-profit council that evaluates and accredits medical residency programs in the United States. Its mission is to improve the quality of health care in the United States by ensuring and improving the quality of graduate medical education for physicians in training. The Neurology Residency Review Committee, one of 27 residency review committees under the umbrella of the ACGME, is charged with overseeing neurology residency training. It does so by creating and distributing program requirements for residency education in neurology, and by reviewing programs on a regular basis to ensure that they are in compliance with these requirements.

The 2005 neurology residency program requirements include the following components for neurology residency training:

- A minimum of 18 months of clinical adult neurology with management responsibility for patient care. This must include at least six months of inpatient experience, and at least six months of outpatient experience in clinical adult neurology.
- A minimum of three months experience in clinical child neurology, with management responsibility in patient care.
- A minimum of one month experience in clinical psychiatry, including cognition and behavior, and under the supervision of a psychiatrist certified by the American Board of Psychology and Neurology.

The neurology program requirements further mandate instruction and practical experience in neurosurgery, rehabilitation, intensive care units, emergency departments, and neuroimaging, including MRI, CT and neurosonology. The time commitment for each of these areas is not specified in the program requirements, however.

The neurology program requirements also require a formal curriculum in bioethics, cost-effective care, end of life issues, palliative care, pain management, and the recognition of physical, sexual, and emotional abuse.

Of note, the program requirements do not mandate specific rotations in the subspecialties of neurology. Rather, they only mandate that residents must regularly attend seminars and conferences in the subspecialties, which include neuro-ophthalmology, neuromuscular diseases, cerebrovascular diseases, epilepsy, movement disorders, critical care, clinical neurophysiology, behavioral neurology, neuroimmunology, infectious diseases, neuro-otology, neuro-oncology, sleep disorders, neurogenetics, and the neurology of aging.

Thus, the curriculum for neurology residency programs is rightfully geared towards general neurology, due to the needs of the neurology department and faculty and the neurology residents, and the requirements of the neurology RRC.

Neurology Fellowships

Specialty training in neurology is obtained through neurology fellowships. The AAN/ANA/AUPN Fellowship Directory lists hundreds of different fellowships in 32 different subspecialties of neurology. About three-fourths of all neurology residents pursue fellowship training in a subspecialty of neurology. The clinical neurophysiology fellowship, which is a one-year fellowship in EEG, EMG and polysomnography, is perhaps the most popular fellowship for graduating neurology residents. There are currently 91 ACGME-accredited clinical neurophysiology fellowship training programs in existence.

Post-residency Education of the General Neurologist

The post-residency education of the general neurologist is dictated by the needs of the community in which the neurologist practices, as well as by the needs of the individual neurologist.

Community Needs

The community in which the neurologist practices expects its neurologists to be up to date in the evaluation and management of patients with neurological disorders. The amount of subspecialty-specific neurologic knowledge that the neurologists must possess depends upon the size of the community. Small communities need generalist neurologists, while larger communities will likely have several neurologists, some of whom are trained in a neurologic subspecialty.

Neurologic procedures are another community need. Primary neurologic procedures include EEG and EMG, and all communities would likely expect their neurologists to perform and interpret these procedures. Neurologists in small communities are increasingly performing botulinum toxin injections and polysomnography. Major referral centers would expect to have neurologists who are proficient in neurosonology and endovascular techniques.

Needs of the Neurologist

The post-residency education needs of the general neurologist are both egalitarian and practical. The egalitarian motive for post-residency education is to improve the quality of medical care provided to the patients by keeping abreast of new developments in the field. The practical motive for post-residency education is to ensure economic survival of the individual neurologist, by learning new income-generating procedures, such as botulinum toxin injections, neurosonology, polysomnography, and endovascular techniques.

Role of the AAN in Post-Residency Education of the General Neurologist

The AAN plays a major role in post-residency education of the general neurologist by providing continuing medical education credits and self-assessment modules. The AAN Annual Meeting is a major source of CME credits, which may be obtained by participating in the annual meeting courses and the science programs. Regional programs and workshops complement the annual meeting by providing update courses in neurology and workshops in new techniques in various locations throughout the country. *Continuum* and *Quintessentials* provide focused reviews of the core topics of neurology, as well as self-assessment modules. *Quintessentials*, in particular, allows a physician in practice to compare his or her practice patterns with peers and a panel of experts. Journal Online CME is yet another method of obtaining CME credits by reading key articles in the literature. Finally, the AAN will develop self-assessment modules to prepare neurologists for the ABPN recertifying examinations.

Maintenance of Certification

Within the past several years, the American Board of Medical Specialties (ABMS) has adopted a Maintenance of Certification (MOC) program for all licensed physicians. This initiative is part of a national movement to increase physicians' accountability to the patients they serve, and to improve the quality of medical care provided to the patients. The American Board of Psychiatry and Neurology (ABPN), a member board of the ABMS, is required to develop a program of maintenance of certification for all of its diplomates.

The maintenance of certification program is designed to show evidence of competence in four key areas: professional standing, self-assessment and lifelong learning, cognitive expertise, and performance in practice. These four areas are described below:

- Professional Standing: This requirement may be met by holding a current, unrestricted license to practice medicine.
- Self-assessment and Lifelong Learning: Every ten years, diplomates will be required to demonstrate participation in one self-assessment activity, and show evidence of completion of 300 specialty-specific Category 1 CME credits.
- Cognitive Expertise: This requirement is met by passing the ABPN Recertification Examination every ten years.
- Performance in Practice: This component evaluates the medical care provided for common health problems, as well as physician behaviors, such as communication and professionalism, as they relate to patient care. The ABPN is currently developing standards for evaluating this component, and expects to have this component in place by 2010.

Is There a Need for Subspecialization in Neurology?

Within the past ten years, a number of neurology subspecialties have been recognized by the ACGME and ABMS as distinct subspecialties in neurology. These include clinical neurophysiology, vascular neurology, pain medicine, and neurodevelopmental disabilities. These four subspecialties have specific program requirements developed by the Neurology Residency Review Committee, and specific certifying examinations developed by the ABPN. Some of them, such as clinical neurophysiology, are quite popular, with over 90 accredited programs in existence and over 200 fellowship positions filled. Others, such as pain medicine, have only two accredited programs in existence.

United Council for Neurologic Subspecialties

Gaining acceptance of a new subspecialty certificate through the ABMS is complex, as this system is not organized to accredit and certify newly developing subspecialties. As a result, the United Council for Neurologic Subspecialties (UCNS) was established. The UCNS is a professional organization that provides for accreditation and certification in neurological subspecialties, with the goal of enhancing the quality of training for physicians and the quality of patient care in these subspecialties. The UCNS parent organizations include the American Academy of Neurology, the American Neurological Association, the Association of University Professors in Neurology, the Child Neurology Society, and the Professors of Child Neurology. The UCNS is unique, in that it offers both accreditation of programs and certification of trainees. This contrasts with the ACGME and ABMS, each of which have only one of these missions assigned: accreditation of programs by the ACGME, and certification of trainees by the ABMS.

Thus far, two neurologic subspecialties have applied for membership in the UCNS: behavioral neurology and neuromuscular pathology. Program requirements and certifying examinations will be developed for both of these subspecialties in the near future.

The Need for Subspecialization in Neurology

In reviewing the neurologic subspecialties that have already been approved by the ACGME, ABMS and UCNS, the specialties fall into two dichotomous categories, as follows:

Procedural subspecialties, in competition with other primary specialties of medicine

Neurologic subspecialty	Competing specialties	Procedure	Number of programs	Number of filled positions
Clinical neurophysiology	Physiatry	EMG	91	229
Vascular neurology	Radiology, Cardiology	Stenting	22	20
Pain medicine	Anesthesiology	Nerve blocks	2	0
Neuromuscular pathology	Anatomic pathology	Muscle and nerve biopsies	0	0

Cognitive subspecialties without competition from other primary medical specialties

Neurologic subspecialty	Competing specialties	Procedure	Number of programs	Number of filled positions
Neurodevelopmental disabilities	Pediatrics	None	8	7
Behavioral neurology	Psychiatry	None	0	0

The procedural subspecialties have an obvious need for an official method of accrediting programs and certifying trainees, namely "turf protection" from other medical specialties that share these procedures. It is likely that these subspecialties will survive and flourish, since there is a strong financial motivation for their success.

The future of program accreditation and trainee certification in the cognitive subspecialties is less certain, since financial "turf wars" with other primary specialties are less likely to occur. Furthermore, the costs associated with program accreditation and trainee certification in these subspecialties are not insignificant, and the whole process may not be worth the "bang for the buck".

The following table lists the costs to the trainee associate with certification and recertification in Neurology and its subspecialties:

Examination	Total Cost
ABPN Part 1 exam	\$1600
ABPN Part 2 exam	\$1725
ABPN Subspecialty exam	\$2075
ABPN Recertification exam	\$2075
UCNS Certification exam	\$1200

Bibliography

Ringel SP, Vickrey BG, Keran CM, Bieber J, Bradley WG: Training the future neurology workforce. Neurology 54:480-4, 2000.

Websites

Accreditation Council for Graduate Medical Education: www.acgme.org

American Board of Medical Specialties: www.abms.org

American Board of Psychiatry and Neurology: www.abpn.com

United Council for Neurologic Subspecialties: www.ucns.org