



AMERICAN ACADEMY OF  
FAMILY PHYSICIANS

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Recommended Curriculum Guidelines for Family Medicine Residents

# Conditions of the Nervous System

*This document was endorsed by the American Academy of Family Physicians (AAFP).*

## Introduction

This Curriculum Guideline defines a recommended training strategy for family medicine residents. Topic competencies, attitudes, knowledge, and skills that are critical to family medicine should be attained through longitudinal experience that promotes educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME), [www.acgme.org](http://www.acgme.org). The curriculum must include structured experience in several specified areas. Most of the resident's knowledge will be gained by caring for ambulatory patients who visit the family medicine center. Structured didactic lectures, conferences, journal clubs, and workshops must be included in the curriculum with an emphasis on outcomes-oriented, evidence-based studies that delineate common and chronic diseases affecting patients of all ages. Targeted techniques of health promotion and disease prevention are hallmarks of family medicine. Appropriate referral patterns and provision of cost-effective care should also be part of the curriculum.

Program requirements specific to family medicine residencies may be found on the ACGME website. Current AAFP Curriculum Guidelines may be found online at [www.aafp.org/cg](http://www.aafp.org/cg). These guidelines are periodically updated and endorsed by the AAFP and, in many instances, other specialty societies, as indicated on each guideline.

Each residency program is responsible for its own curriculum. ***This guideline provides a useful strategy to help residency programs form their curricula for educating family physicians.***

## **Preamble**

A solid understanding of normal neurological development, anatomy, and neurophysiology is imperative to the treatment of neurological pathology. The goal of these guidelines is to sensitize the family medicine resident to the role of neurological disease in patients and familiarize residents with its particular place in the overall practice of family medicine. Neurological problems are estimated to comprise 10 to 15 percent of a family physician's workload. History taking in neurology and performance of a comprehensive neurological examination are essential skills for all family physicians. Emphasis on good diagnostic and therapeutic skills and the appropriate consideration of biopsychosocial and cultural factors must be included in the curriculum.

The maturation of the nervous system is complex, and it changes based on genetic, environmental, learned, and acquired influences. Both the variability of presentation and degree of pathophysiology can make diagnosis very difficult. Many of the processes are marked by slow episodic degeneration, which patients often learn to overcome or hide. Although many disorders are genetic, detailed family history may not always be helpful. Neurologic diseases can carry significant social stigma, and family physicians must address both the medical and often severe psychosocial stress that each disorder can cause in the patient and his or her family. Family medicine residents should be aware of social-cultural variations and take time to be sensitive to the differences among cultures and their perception of disease. Teaching residents to learn and study differences of belief systems should be a major goal of family medicine education.

This Curriculum Guideline provides an outline of the attitudes, knowledge, and skills that should be among the objectives of training programs in family medicine and which will lead to optimal care of patients with neurological disorders by future family physicians.

## **Competencies**

At the completion of residency training, a family medicine resident should:

- Be able to perform standardized, comprehensive neurological assessments and obtain necessary further investigation (Patient Care, Medical Knowledge)
- Be able to understand normal neurological development, anatomy, and physiology (Patient Care, Medical Knowledge)
- Be able to utilize evidence-based diagnostic and treatment strategies when managing a patient with suspected neurologic disease (Systems-based Practice, Practice-based Learning and Improvement)
- Be able to optimize treatment plans utilizing local resources that include local, state, and federal agencies (Systems-based Practice, Practice-based Learning and Improvement)
- Coordinate ambulatory, inpatient, and institutional care across health care providers, institutions, and governmental agencies (System-based Practice)

- Be able to communicate in a compassionate, knowledgeable manner and address complex psychosocial issues based on the patient and his or her family unit (Interpersonal and Communication Skills)
- Be able to recognize his or her own practice limitations and seek consultation with other health care providers to provide optimal care (Medical Knowledge)

## **Attitudes**

The resident should develop attitudes that encompass:

- A compassionate approach to the care of the patient who has a neurological disease, within the patient's own cultural, religious, and social context
- Recognition of the physician's own level of competence in handling neurological problems and the need for further consultation as appropriate
- Utilization of self-directed learning toward further knowledge and competence in neurology
- Understanding of the role played by the neurology consultant and appropriate collaborative care for certain neurological conditions
- Support of the patient through the process of consultation, neurological evaluation, treatment, rehabilitation, and possible progression of neurologic illness
- Recognition of times when limiting further investigation and treatment is in the best interest of the patient, and lifelong learning and contribution to the body of knowledge about neurological disease, health, and the medical management of the neurologically impaired patient
- Awareness of the importance of a multidisciplinary approach to the enhancement of individualized care
- Willingness to be accessible to and accountable for his or her patients
- Awareness of the importance of cost containment

## **Knowledge**

In the appropriate setting, the resident should demonstrate the ability to apply knowledge of:

1. Normal anatomy and physiology that allow localization of neurological disease
2. Normal growth, development, and senescence of the nervous system

3. Diagnosis, initial workup, and primary care management of:
  - a. Dementia
    - i. Alzheimer
    - ii. Frontotemporal
    - iii. Parkinson
    - iv. Vascular
    - v. Lewy body
    - vi. Pseudodementia
  - b. Delirium
  - c. Headache
    - i. Tension
    - ii. Cluster
    - iii. Migraine
    - iv. Rebound/medication withdrawal
  - d. Peripheral neuropathy
  - e. Lightheadedness/Vertigo
    - i. Benign paroxysmal position vertigo
    - ii. Meniere disease
    - iii. Labyrinthitis
    - iv. Vestibular neuritis
  - f. Neurological complications and comorbidities of developmental delay/mental retardation/learning disability
  - g. Tremor
    - i. Essential tremor
    - ii. Parkinson disease
  - h. Motor disorders
    - i. Restless legs syndrome
  - i. Neuralgia
    - i. Trigeminal neuralgia
    - ii. Postherpetic neuralgia
  - j. Concussion/Traumatic brain injury
  - k. Paresthesia
    - i. Vitamin deficiency
    - ii. Alcohol-induced
  - l. Nerve palsies
    - i. Bell palsy
    - ii. Brachial plexus palsy

4. Diagnosis, initial diagnostic workup, and management in collaboration with neurology consultant of:
  - a. Amyotrophic lateral sclerosis
  - b. Central nervous system (CNS) malformations
  - c. CNS neoplasms
  - d. Horner syndrome
  - e. Microcephaly, macrocephaly, plagiocephaly, and craniosynostosis
  - f. Multiple sclerosis
  - g. Muscular dystrophy
  - h. Neuromuscular disorders
    - i. Polymyositis
    - ii. Dermatomyositis
  - i. Normal-pressure hydrocephalus
5. Indications, contraindications, risks, and significance of ancillary tests
  - a. Lumbar puncture and its performance
  - b. Electroencephalogram
  - c. Visual, brain stem auditory, and somatosensory evoked potential
  - d. Nerve conduction study and electromyography (Neural-Scan)
  - e. Muscle and nerve biopsy
  - f. Computed axial tomography, with and without contrast
  - g. Magnetic resonance imaging, with and without contrast
  - h. Magnetic resonance angiography
  - i. Angiography
  - j. Myelography
  - k. Carotid ultrasound
  - l. Sleep study
  - m. Genetic testing
  - n. Positron emission tomography (PET) scanning
  - o. Single-photon emission computed tomography (SPECT) scanning
6. The psychological and rehabilitation aspects of patient management, especially for chronic neurological conditions. This could include the use of other modalities such as manipulation, physical therapy, occupational therapy, and alternative or complementary medicine adjuncts.

7. The genetic basis of certain neurological disorders as they affect the patient, his or her family, and education of the family regarding the benefits of genetic counseling
8. Neurological complications of systemic illness
9. Recognition of potential drug interactions and adverse drug effects, especially in elderly patients
10. Understanding of end-of-life issues in neurological disorders, the role of palliative care services, and ethical and legal aspects of terminal care

## **Skills**

In the appropriate setting, the resident should demonstrate the ability to independently perform or appropriately refer:

1. Evaluation skills
  - a. To be able to take an appropriate focused and comprehensive history (including necessary information from others) and communicate this verbally or in writing and in summary form
  - b. To be able to examine the mental and physical state (including a complete neurological and mental status examination, Glasgow Coma scale, and pediatric developmental exam) and communicate verbally or in writing and in summary form to other providers
  - c. Using clinical knowledge to localize the lesion and formulate an ordered differential diagnosis based on an appreciation of the patient, his or her history, current problems, and likely causes
  - d. Assessing the acuity and prognosis of the clinical problem as it relates to the need for immediate management and the requirement for expert assistance
  - e. Formulating a rational plan for further investigation and management
2. Management skills
  - a. Formulating a diagnostic and management plan and assessing the need for expert advice with an awareness of the risks, benefits, and costs of evaluation
  - b. Understanding the role of a neurology specialist, the implications of special testing in patients who have neurologic disease, and the implications of the test results for the patient

- c. Managing the prevalent and treatable conditions listed in this curriculum with consultation as appropriate. Developing a differential diagnosis for the following symptoms:
    - i. Altered mental status
    - ii. Auditory changes
      - 1). Tinnitus, hearing loss
    - iii. Dizziness
      - 1). Vertigo, presyncope, syncope
    - iv. Focal neurologic deficit
    - v. Headache
    - vi. Hemiparesis/Unilateral weakness
    - vii. Memory loss
    - viii. Myalgia, muscle weakness
    - ix. Pain
      - 1). Please refer to the AAFP Curriculum Guideline *Chronic Pain Management* (Reprint No. 286).
    - x. Paresthesia
    - xi. Seizure
    - xii. Tremor
    - xiii. Muscle weakness
    - xiv. Visual changes
      - 1). Vision loss, diplopia
      - 2). Please refer to the AAFP Curriculum Guideline *Conditions of the Eye* (Reprint No. 263).
  - d. Recognizing, initiating workup, and managing emergent neurology problems and obtaining urgent consultation when appropriate, including:
    - i. Stroke
    - ii. Meningitis and encephalitis
    - iii. Seizure disorder
      - 1). Status epilepticus
    - iv. Central nervous system trauma, including spinal cord injury
    - v. Increased intracranial pressure
    - vi. Acute visual loss
    - vii. Rapidly progressive neurological deficit
    - viii. Neurological respiratory failure
    - ix. Altered mental status
    - x. Cauda equina syndrome
    - xi. Neural tube defects
    - xii. Abnormalities of cerebral vasculature, including cerebral aneurysm
3. Managing the familial, cultural, and psychosocial issues that accompany the long-term care of patients who have debilitating neurological conditions, including home and community care, the utilization of community resources, the use of a multidisciplinary team, and the primary role of the family physician as coordinator of long-term care



## Implementation

Implementation of this Curriculum Guideline is best achieved within the capabilities of the particular residency program and at the discretion of the residency director. The resident must have the opportunity to diagnose and manage (under appropriate supervision) patients who have known neurological disorders, as well as patients with signs and symptoms suggestive of nervous system pathology. Neurology consultation should supplement the educational process in the care of patients with neurologic disorders. Communication between all members of the multidisciplinary management team should be emphasized, with the intent of facilitation of patient diagnosis and management.

A range of learning methods and activities are appropriate to the curricular objectives; these substantially overlap but include:

- Observation of and case discussion with faculty and fellow residents
- Supervised clinical practice (inpatient, outpatient, primary care, referral, and on-call)
- Clinical and other presentations; preparation of case reports
- Participation in clinical lectures, seminars, and tutorials
- Self-directed learning by reading of evidence-based resources
- Research and presentation of research
- Teaching of undergraduates and postgraduates (medical and other health professionals)

## Resources

Brazis PW, Masdeu JC, Biller J. *Localization in Clinical Neurology*. 6<sup>th</sup> ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2011.

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Yousem DM, Grossman RI. *Neuroradiology: The Requisites*. 3<sup>rd</sup> ed. Philadelphia, PA: Mosby; 2010.

## Website Resources

American Academy of Neurology. [www.aan.com](http://www.aan.com)

*American Family Physician* by Topic (Multiple articles):

- Dementia. [www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=5](http://www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=5)
- Seizure Disorders. [www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=80](http://www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=80)
- Stroke. [www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=24](http://www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=24)

Harvard University. The Whole Brain Atlas. [www.med.harvard.edu/AANLIB/home.html](http://www.med.harvard.edu/AANLIB/home.html)

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