

# ACGME Program Requirements for Graduate Medical Education in Neurological Surgery

*Common Program Requirements are in BOLD*

*Effective: July 1, 2007*

## Introduction

### A. Definition of Discipline

Neurological surgery is the discipline of medicine and specialty of surgery that provides operative and nonoperative management of the central, peripheral, and autonomic nervous systems, including their supporting structures and vascular supply. This management may include the prevention, diagnosis, evaluation, treatment, critical care, and rehabilitation of disorders in those areas. Neurological surgery encompasses all of the following:

1. evaluation and treatment of pathological processes that modify the function or activity of the nervous system, including the hypophysis;
2. the operative and nonoperative management of pain;
3. the surgical, nonsurgical and stereotactic radiosurgical treatment of adult and pediatric patients with disorders of the nervous system;
4. disorders of the brain, meninges, skull, including skull base, and their blood supply, including the surgical and endovascular treatment of disorders of the intracranial and extracranial vasculature supplying the brain and spinal cord;
5. disorders of the pituitary gland and spinal cord, meninges, and vertebral column, including those that may require treatment by fusion, instrumentation, or endovascular techniques; and,
6. disorders of the cranial and spinal nerves throughout their distribution.

### B. Duration and Scope of Education

1. A neurological surgery training program must include a minimum of one year of training in a program accredited by the Accreditation Council for Graduate Medical Education (ACGME) for the resident to acquire fundamental clinical skills as defined below. Residents should complete this training before the third year of neurological surgery training.

2. The neurosurgery program director is responsible for the design, implementation, and oversight of a PGY-1 year that will prepare residents for education in neurological surgery.
  - a) During this year, residents must participate in clinical and didactic activities to:
    - (1) Develop the knowledge, attitudes and skills needed to formulate principles and assess, plan, and initiate treatment of patients with surgical and medical problems;
    - (2) Be involved in the care of patients with surgical and medical emergencies, multiple organ system trauma, and nervous system injuries and diseases;
    - (3) Gain experience in the care of critically ill surgical and medical patients;
    - (4) Participate in the pre-, intra-, and post-operative care of surgical patients; and,
    - (5) Develop basic surgical skills
  - b) In order to meet the goals of the PGY-1 Year there must be:
    - (1) At least six months of structured educational experience in surgery, as approved by the neurosurgery program director. The program director should consider training in adult and pediatric operative surgery, surgical critical care, and emergency/multi-system trauma care;
    - (2) three months of training in an ACGME-accredited neurology training program preferably included in the PGY1-year; and,
    - (3) no more than three months of neurological surgery.
3. The neurological surgery training program is 60 months in duration, in addition to the year of acquisition of fundamental clinical skills. The program must provide 36 months of clinical neurological surgery at the sponsoring institution or one of its approved participating sites.

4. The remaining time not devoted to clinical neurology and neurosurgery should be spent in the study of the basic sciences, neuroradiology, neuropathology, or other appropriate subject matter related to the neurosciences. These topics should be agreed upon by individual residents and the program director. The program director should consult the American Board of Neurological Surgery for certification requirements concerning any training conducted outside the approved sites of the program.
5. All residents must have a minimum of three months training in an ACGME-accredited neurology residency program, unless they have previously had at least one year of formal residency training in an accredited neurology training program. This training may be taken during the year of fundamental clinical skills.
6. The program must provide residents with experience in direct and progressively responsible patient management as they advance through training.
7. Residents must spend a 12-month period of time as chief resident on the neurological surgery clinical service in the sponsoring institution or its approved participating sites.
  - a) The chief resident must have major or primary responsibility for patient management with faculty supervision.
  - b) The chief resident should also have administrative responsibility as designated by the program director.
  - c) The specific portion of the clinical training that constitutes the 12 months of chief residency must be specifically designated as the chief residency experience and must be identified at the time of program review.
8. Prior to entry into the program, each resident must be notified in writing of the length of training. The prescribed length of training for a particular resident may not be changed without mutual agreement during his or her program unless there is a break in his or her training or the resident requires remedial training. Any training added to the accredited residency must be based on a clear educational rationale and must not interfere with the education and training of the residents enrolled in the program.

## **I. Institutions**

### **A. Sponsoring Institution**

**One sponsoring institution must assume ultimate responsibility for the program, as described in the Institutional Requirements, and this responsibility extends to resident assignments at all participating sites.**

**The sponsoring institution and the program must ensure that the program director has sufficient protected time and financial support for his or her educational and administrative responsibilities to the program.**

1. The sponsoring institution for a neurological surgery program must be in a single geographic location. Appropriate institutions include medical schools and hospitals. The institution must demonstrate commitment to the program in terms of financial and academic support, including timely appointment of a permanent department or division chairperson of neurological surgery.

### **B. Participating Sites**

1. **There must be a program letter of agreement (PLA) between the program and each participating site providing a required assignment. The PLA must be renewed at least every five years.**

**The PLA should:**

- a) **identify the faculty who will assume both educational and supervisory responsibilities for residents;**
- b) **specify their responsibilities for teaching, supervision, and formal evaluation of residents, as specified later in this document;**
- c) **specify the duration and content of the educational experience; and,**
- d) **state the policies and procedures that will govern resident education during the assignment.**

2. **The program director must submit any additions or deletions of participating sites routinely providing an educational experience, required for all residents, of one month full time equivalent (FTE) or more through the Accreditation Council for Graduate Medical Education (ACGME) Accreditation Data System (ADS).**
3. An integrated site must function as a single neurological surgery service with the sponsoring institution. The program director must demonstrate to the Review Committee that the clinical service operates as a single unit in the assignment of residents and their faculty supervisors, the formulation of call schedules, and the convening of teaching conferences and related educational activities.
4. A participating site functions as a separate neurological surgical service with a local training director under the direction of the program director and should be sufficiently close to the sponsoring institution to ensure peer interaction and regular attendance at joint conferences and other activities. Appropriate exceptions may be considered for special resource hospitals (e.g. pediatrics, trauma).

## **II. Program Personnel and Resources**

### **A. Program Director**

1. **There must be a single program director with authority and accountability for the operation of the program. The sponsoring institution's GMEC must approve a change in program director. After approval, the program director must submit this change to the ACGME via the ADS.**
2. **The program director should continue in his or her position for a length of time adequate to maintain continuity of leadership and program stability.**
3. **Qualifications of the program director must include:**
  - a) **requisite specialty expertise and documented educational and administrative experience acceptable to the Review Committee;**
  - b) **current certification in the specialty by the American Board of Neurological Surgery, or specialty qualifications that are acceptable to the Review Committee; and,**

- c) **current medical licensure and appropriate medical staff appointment.**
- 4. **The program director must administer and maintain an educational environment conducive to educating the residents in each of the ACGME competency areas. The program director must:**
  - a) **oversee and ensure the quality of didactic and clinical education in all sites that participate in the program;**
  - b) **approve a local director at each participating site who is accountable for resident education;**
  - c) **approve the selection of program faculty as appropriate;**
  - d) **evaluate program faculty and approve the continued participation of program faculty based on evaluation;**
  - e) **monitor resident supervision at all participating sites;**
  - f) **prepare and submit all information required and requested by the ACGME, including but not limited to the program information forms and annual program resident updates to the ADS, and ensure that the information submitted is accurate and complete;**
  - g) **provide each resident with documented semiannual evaluation of performance with feedback;**
  - h) **ensure compliance with grievance and due process procedures as set forth in the Institutional Requirements and implemented by the sponsoring institution;**
  - i) **provide verification of residency education for all residents, including those who leave the program prior to completion;**
  - j) **implement policies and procedures consistent with the institutional and program requirements for resident duty hours and the working environment, including moonlighting, and, to that end, must:**
    - (1) **distribute these policies and procedures to the residents and faculty;**

- (2) monitor resident duty hours, according to sponsoring institutional policies, with a frequency sufficient to ensure compliance with ACGME requirements;**
  - (3) adjust schedules as necessary to mitigate excessive service demands and/or fatigue; and,**
  - (4) if applicable, monitor the demands of at-home call and adjust schedules as necessary to mitigate excessive service demands and/or fatigue.**
- k) monitor the need for and ensure the provision of back up support systems when patient care responsibilities are unusually difficult or prolonged;**
- l) comply with the sponsoring institution's written policies and procedures, including those specified in the Institutional Requirements, for selection, evaluation and promotion of residents, disciplinary action, and supervision of residents;**
- m) be familiar with and comply with ACGME and Review Committee policies and procedures as outlined in the ACGME Manual of Policies and Procedures;**
- n) obtain review and approval of the sponsoring institution's GMEC/DIO before submitting to the ACGME information or requests for the following:**
  - (1) all applications for ACGME accreditation of new programs;**
  - (2) changes in resident complement;**
  - (3) major changes in program structure or length of training;**
  - (4) progress reports requested by the Review Committee;**
  - (5) responses to all proposed adverse actions;**
  - (6) requests for increases or any change to resident duty hours;**

- (7) voluntary withdrawals of ACGME-accredited programs;**
  - (8) requests for appeal of an adverse action;**
  - (9) appeal presentations to a Board of Appeal or the ACGME; and,**
  - (10) proposals to ACGME for approval of innovative educational approaches.**
- o) obtain DIO review and co-signature on all program information forms, as well as any correspondence or document submitted to the ACGME that addresses:**
  - (1) program citations, and/or**
  - (2) request for changes in the program that would have significant impact, including financial, on the program or institution.**
- p) obtain Review Committee approval for the addition or deletion of any participating site rotation;**
- q) be responsible for the annual collection, compilation, and retention of the number and types of neurological surgery operative procedures performed in all sites and facilities utilized in the clinical education of residents. This information must be provided in the format specified by the Review Committee;**
- r) ensure the annual compilation of a comprehensive and accurate record of the number and type of operative procedures performed by each resident completing the program. This record must include all procedures in which the neurological surgery resident was either resident surgeon or assistant and must be signed by both the resident and the program director as a statement of its accuracy. This information must be provided in the format specified by the Review Committee;**
- s) ensure that the profile of clinical experience reported to the Review Committee be limited to that utilized in the resident's educational program. It also is understood that the educational requirements of the resident must be considered at all times, and assignment to a clinical service that limits or**

precludes educational opportunities will be adversely considered in evaluation of the program;

- t) ensure that a current, well-organized, written plan for rotation of residents among the various services and sites involved is maintained and is available to the residents and faculty;
- u) ensure that there is a well-coordinated schedule of teaching conferences, rounds, and other educational activities in which both the neurological surgery faculty and residents participate. Conferences must be coordinated among training program sites to allow attendance by a majority of staff and residents. A conference attendance record for both residents and faculty must be maintained;
- v) maintain explicit written descriptions of supervisory lines of responsibility for the care of patients. Such guidelines must be communicated to all members of the program staff; and,
- w) ensure that attending physicians or supervising residents with appropriate experience for the severity and complexity of the patients' condition are available at all times on site. The responsibility or independence given to residents in patient care should depend on their knowledge, their technical skill, their experience, the complexity of the patients' illness, and the risk of the operative procedures.

## **B. Faculty**

- 1. At each participating site, there must be a sufficient number of faculty with documented qualifications to instruct and supervise all residents at that location.**

**The faculty must:**

- a) devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities; and to demonstrate a strong interest in the education of residents, and**
- b) administer and maintain an educational environment conducive to educating residents in each of the ACGME competency areas.**

- 2. The physician faculty must have current certification in the specialty by the American Board of Neurological Surgery, or possess qualifications acceptable to the Review Committee.**
  - a) Neurological surgery faculty participation in undergraduate medical education is desirable.
  - b) There should be a minimum faculty of three neurological surgeons at the primary teaching site.
  - c) Training directors at Participating Sites
    - (1) The training director shall be a qualified neurological surgeon appointed by and responsible to the program director in each geographically separate site. This individual must be responsible for the education of the residents and also will supervise the educational activities of other neurological surgeons relating to resident education at that site. Appropriate exceptions may be considered for special resource hospitals.
    - (2) These appointments will generally be for a one-year period and can be renewable to ensure continuity of leadership.
    - (3) The training director in neurological surgery at each participating site must have major clinical responsibilities at that site.
  - d) The physician faculty must have an in-depth understanding of basic mechanisms of normal and abnormal states and the application of current knowledge to practice.
  - e) When a change in chairmanship occurs within an accredited neurological surgery training program, the program must be site-visited within two years.
- 3. The physician faculty must possess current medical licensure and appropriate medical staff appointment.**
- 4. The nonphysician faculty must have appropriate qualifications in their field and hold appropriate institutional appointments.**
- 5. The faculty must establish and maintain an environment of inquiry and scholarship with an active research component.**

- a) **The faculty must regularly participate in organized clinical discussions, rounds, journal clubs, and conferences.**
- b) **Some members of the faculty should also demonstrate scholarship by one or more of the following:**
  - (1) **peer-reviewed funding;**
  - (2) **publication of original research or review articles in peer-reviewed journals, or chapters in textbooks;**
  - (3) **publication or presentation of case reports or clinical series at local, regional, or national professional and scientific society meetings; or,**
  - (4) **participation in national committees or educational organizations.**
- c) **Faculty should encourage and support residents in scholarly activities.**

#### **C. Other Program Personnel**

**The institution and the program must jointly ensure the availability of all necessary professional, technical, and clerical personnel for the effective administration of the program.**

#### **D. Resources**

**The institution and the program must jointly ensure the availability of adequate resources for resident education, as defined in the specialty program requirements.**

##### **1. Inpatient facilities**

- a) **Inpatient facilities available for training programs in neurological surgery should have an adequate number of beds, support personnel, and proper equipment to ensure quality education and excellence in patient care.**
- b) **The presence of a neurological surgery operating room with microsurgical capabilities and an intensive care unit specifically for the care of neurological surgery patients is desirable to a training program, as are other units for specialized neurological surgery care.**

- c) Similarly, neurological surgery beds should be on a unit designated for the care of neurosurgery patients.

## 2. Outpatient Facilities

Residents must have available appropriate outpatient facilities, clinic, and office space for training purposes in the regular preoperative evaluation and postoperative follow-up for cases for which the resident has responsibility.

## 3. Research Facilities

- a) There should be space and support personnel for research identified in the neurological surgery division or department, and some activity should be ongoing in this area.
- b) Clinical and/or basic research opportunities should be available to the neurological surgery resident with appropriate faculty supervision.

- 4. Recognizing the nature of the specialty of neurological surgery, it is unlikely that a program can mount an adequate educational experience for neurological surgery residents without approved training programs in related fields. Clinically oriented training programs in the sponsoring institution of the neurological surgery program should include accredited training programs in neurology, general surgery, internal medicine, pediatrics, and radiology.

- 5. There should be clinical resources for the education of neurological surgery residents in anesthesiology, critical care, emergency medicine, endocrinology, ophthalmology, orthopedics, otolaryngology, pathology, and psychiatry.

- 6. There shall be sufficient patients admitted each year to ensure that the resident participates in the care of patients suffering from the full spectrum of neurosurgical diseases.

- 7. A program must demonstrate to the satisfaction of the Review Committee that it has both the volume of patients under neurological care and the breadth and depth of academic support to ensure that it may provide excellent neurological surgery training to residents.

8. The volume of patients must be substantiated in part by a compilation of annual institutional operative data and resident operative data (including that from residents rotating on the service from other programs) provided in a fashion prescribed by the Review Committee.
9. Within the total clinical facilities available to the training program, there should be a minimum of 500 major neurological surgery procedures per year per finishing resident. However, meeting this minimum number does not ensure accreditation of a training program.
10. The presence within a given training program of this neurological surgery workload and the distribution of the surgical experience are equally important. For instance, the cases should be appropriately distributed among cranial, extracranial, spinal, and peripheral nerve surgical procedures and should represent a well-balanced spectrum of neurological surgery in both adults and children. This spectrum should include craniotomies for trauma, neoplasms, aneurysms, and vascular malformations; extracranial carotid artery surgery; transsphenoidal and stereotaxic surgery (including radiosurgery); pain management; and spinal procedures of a sufficient number and variety using modern techniques.
11. All affiliated hospitals in the training program should have at least 100 major neurological surgery procedures per year distributed appropriately among the spectrum of cases as described in section II.D.10, above. An exception may be made if a hospital offers special clinical resources, e.g., stereotaxic surgery, trauma, or pediatric neurological surgery, which significantly augment the resources of the training program.
12. During duty hours residents must be provided with adequate sleeping, lounge, and food facilities. Support services must be such that the resident does not spend an inordinate amount of time in noneducational activities that can be discharged properly by other personnel.

#### **E. Medical Information Access**

**Residents must have ready access to specialty-specific and other appropriate reference material in print or electronic format. Electronic medical literature databases with search capabilities should be available.**

### **III. Resident Appointments**

#### **A. Eligibility Criteria**

**The program director must comply with the criteria for resident eligibility as specified in the Institutional Requirements.**

#### **B. Number of Residents**

**The program director may not appoint more residents than approved by the Review Committee, unless otherwise stated in the specialty-specific requirements. The program's educational resources must be adequate to support the number of residents appointed to the program.**

1. The Review Committee will review the selection process of residents and seek evidence that the program evaluates the progression of the residents during training.
2. Where there is demonstrated excellence in providing educational experience for the residents, as determined by the Review Committee, a program may be authorized to enroll more than one resident per year. The ability to do so does not depend on any multiplication of the minimum requirements as established by the program requirements for residency education in Neurological Surgery. In determining the size of a resident complement, the Review Committee will consider the following:
  - a) presence of a faculty of national stature in neurological surgery;
  - b) quality of the educational program;
  - c) quality of clinical care;
  - d) total number and distribution of cases;
  - e) quality of clinical and basic research;
  - f) quality of residents trained by the program, including numbers of residents starting and finishing the program, number of graduates who take written and oral examinations of the American Board of Neurological Surgery, and the number of graduates passing these written and oral examinations; and,

g) facilities.

3. The number of residents at each year of training in a given program shall not exceed the number approved by the most recent accreditation review of that program. A new resident may be appointed to fill a vacancy provided that there is no adverse impact on the existing resident staff. The program must provide the Review Committee with an explanation for the excess complement and its plan for resolution to normal complement.

#### **C. Resident Transfers**

1. **Before accepting a resident who is transferring from another program, the program director must obtain written or electronic verification of previous educational experiences and a summative competency-based performance evaluation of the transferring resident.**
2. **A program director must provide timely verification of residency education and summative performance evaluations for residents who leave the program prior to completion.**

#### **D. Appointment of Fellows and Other Learners**

**The presence of other learners (including, but not limited to, residents from other specialties, subspecialty fellows, PhD students, and nurse practitioners) in the program must not interfere with the appointed residents' education. The program director must report the presence of other learners to the DIO and GMEC in accordance with sponsoring institution guidelines.**

1. Programs must notify the Review Committee when they sponsor or participate in any clinical fellowship taking place within sites participating in the program. This notification must occur before the commencement of such training and at each subsequent review of the program. Documentation must be provided describing the fellowship's relationship to and impact on the residency.
2. If fellows so appointed will, in the judgment of the Review Committee, detract from the education of the regularly appointed residents, the accreditation status of the program may be adversely affected.

#### **IV. Educational Program**

##### **A. The curriculum must contain the following educational components:**

- 1. Overall educational goals for the program, which the program must distribute to residents and faculty annually;**
- 2. Competency-based goals and objectives for each assignment at each educational level, which the program must distribute to residents and faculty annually, in either written or electronic form. These should be reviewed by the resident at the start of each rotation;**
- 3. Regularly scheduled didactic sessions;**
- 4. Delineation of resident responsibilities for patient care, progressive responsibility for patient management, and supervision of residents over the continuum of the program; and,**
- 5. ACGME Competencies**

**The program must integrate the following ACGME competencies into the curriculum:**

##### **a) Patient Care**

**Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents:**

- (1) will gather and understand essential patient information in a timely manner;**
- (2) will generate an appropriate differential diagnosis;**
- (3) will implement an effective plan of management;**
- (4) will prioritize and stabilize multiple patients simultaneously;**
- (5) will competently perform neurosurgical operative procedures;**
- (6) will manage complications;**

- (7) will analyze outcomes;
- (8) will counsel and educate patients and families;
- (9) will provide health care services aimed at preventing health problems and maintaining health;
- (10) will work with health care professionals to provide patient-focused care;
- (11) must participate in the management (including critical care) and surgical care of adult and pediatric patients and experience should include the full spectrum of neurosurgical disorders; and,
- (12) must have opportunities to evaluate patients referred for elective surgery in an outpatient environment. Under appropriate supervision, this experience should include obtaining a complete history, conducting an examination, ordering (if necessary) and interpreting diagnostic studies, and arriving independently at a diagnosis and plan of management. Consonant with their skills and level of experience, residents should be actively involved in preoperative decision making and subsequent operative procedures under the supervision of the attending physician who has ultimate responsibility for the patient. Residents should similarly be actively involved in postsurgical care and follow-up evaluation of their patients to develop skills in assessing postoperative recovery, recognizing and treating complications, communicating with referring physicians, and developing the physician-patient relationship. Preoperative interview and examination of patients already scheduled for a surgical procedure will not satisfy these requirements.
  - (a) Resident participation in and responsibility for operative procedures embracing the entire neurosurgical spectrum should increase progressively throughout the training period.

**b) Medical Knowledge**

**Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. Residents:**

- (1) will generate a differential diagnosis and properly sequence critical actions for patient care, including management complications, morbidity and mortality;
- (2) will synthesize and properly utilize acquired patient data;
- (3) will identify neurosurgical emergencies;
- (4) will know how to access current medical information;
- (5) will understand how to treat neurosurgical conditions;
- (6) will incorporate evidence-based principles;
- (7) must have educational experience in neuroradiology, including endovascular surgical neuroradiology, and neuropathology designed specifically for neurological surgery residents. Such experience should be under the direction of qualified neuroradiologists and preferably endovascular neurosurgeons, and neuropathologists; and,
- (8) must have experience and instruction in the basic neurosciences.

**c) Practice-based Learning and Improvement**

**Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:**

- (1) **identify strengths, deficiencies, and limits in one's knowledge and expertise;**

- (2) **set learning and improvement goals;**
- (3) **identify and perform appropriate learning activities;**
- (4) **systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;**
- (5) **incorporate formative evaluation feedback into daily practice;**
- (6) **locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;**
- (7) **use information technology to optimize learning; and,**
- (8) **participate in the education of patients, families, students, residents and other health professionals.**
- (9) **apply knowledge of study design and statistical methods to critically appraise the medical literature;**
- (10) **Facilitate the learning of students and other health care professionals**
  - (a) **Resident participation in undergraduate medical education is desirable.**

**d) Interpersonal and Communication Skills**

**Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents are expected to:**

- (1) **communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;**

- (2) **communicate effectively with physicians, other health professionals, and health related agencies;**
- (3) **work effectively as a member or leader of a health care team or other professional group;**
- (4) **act in a consultative role to other physicians and health professionals; and,**
- (5) **maintain comprehensive, timely, and legible medical records, if applicable.**
- (6) **develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;**
- (7) **develop effective written communication skills;**
- (8) **involve patients in medical decisions; and,**
- (9) **strengthen listening and non-verbal communication skills.**

**e) Professionalism**

**Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:**

- (1) **compassion, integrity, and respect for others;**
- (2) **responsiveness to patient needs that supersedes self-interest;**
- (3) **respect for patient privacy and autonomy;**
- (4) **accountability to patients, society and the profession; and,**
- (5) **sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.**

- (6) treat patients/family/staff/ paraprofessional personnel with respect;
- (7) demonstrate sensitivity to patient's pain, emotional state, and gender/ethnicity issues;
- (8) discuss death honestly, sensitively, patiently, and compassionately;
- (9) exemplify integrity;
- (10) accept responsibility/accountability;
- (11) demonstrate reliability;
- (12) maintain calm, even temperament;
- (13) exhibit self-awareness and knowledge of limits;
- (14) respond to the comments of other team members, patients, families, and peers openly and responsibly; and,
  - (a) Graduate training in neurological surgery requires a commitment to continuity of patient care, as practiced by qualified neurological surgeons. This continuity of care must take precedence-without regard to the time of day, day of the week, number of hours already worked, or on-call schedules. At the same time, patients have a right to expect a healthy, alert, responsible, and responsive physician dedicated to delivering effective and appropriate care.

**f) Systems-based Practice**

**Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:**

- (1) work effectively in various health care delivery settings and systems relevant to their clinical specialty;**

- (2) **coordinate patient care within the health care system relevant to their clinical specialty;**
- (3) **incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;**
- (4) **advocate for quality patient care and optimal patient care systems;**
- (5) **work in interprofessional teams to enhance patient safety and improve patient care quality; and,**
- (6) **participate in identifying system errors and implementing potential systems solutions.**
- (7) understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;
- (8) understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
- (9) practice cost-effective health care and resource allocation that does not compromise quality of care;
- (10) advocate, coordinate, and facilitate patient care; and,
- (11) understand principles of and advance practices for patient safety at the institutional and individual level.

## **B. Residents' Scholarly Activities**

1. **The curriculum must advance residents' knowledge of the basic principles of research, including how research is conducted, evaluated, explained to patients, and applied to patient care.**
2. **Residents should participate in scholarly activity.**
  - a) Graduate medical education must take place in an environment of inquiry and scholarship in which residents

participate in the development of new knowledge, learn to evaluate research findings, and develop habits of inquiry as a continuing professional responsibility.

3. **The sponsoring institution and program should allocate adequate educational resources to facilitate resident involvement in scholarly activities.**

## **V. Evaluation**

### **A. Resident Evaluation**

#### **1. Formative Evaluation**

- a) **The faculty must evaluate resident performance in a timely manner during each rotation or similar educational assignment, and document this evaluation at completion of the assignment.**
- b) **The program must:**
  - (1) **provide objective assessments of competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice;**
  - (2) **use multiple evaluators (e.g., faculty, peers, patients, self, and other professional staff);**
  - (3) **document progressive resident performance improvement appropriate to educational level; and,**
  - (4) **provide each resident with documented semiannual evaluation of performance with feedback.**
- c) **The evaluations of resident performance must be accessible for review by the resident, in accordance with institutional policy.**

#### **2. Summative Evaluation**

**The program director must provide a summative evaluation for each resident upon completion of the program. This evaluation**

**must become part of the resident's permanent record maintained by the institution, and must be accessible for review by the resident in accordance with institutional policy. This evaluation must:**

- a) document the resident's performance during the final period of education, and**
- b) verify that the resident has demonstrated sufficient competence to enter practice without direct supervision.**

#### **B. Faculty Evaluation**

- 1. At least annually, the program must evaluate faculty performance as it relates to the educational program.**
- 2. These evaluations should include a review of the faculty's clinical teaching abilities, commitment to the educational program, clinical knowledge, professionalism, and scholarly activities.**
- 3. This evaluation must include at least annual written confidential evaluations by the residents.**

#### **C. Program Evaluation and Improvement**

- 1. The program must document formal, systematic evaluation of the curriculum at least annually. The program must monitor and track each of the following areas:**
  - a) resident performance;**
  - b) faculty development;**
  - c) graduate performance, including performance of program graduates on the certification examination; and,**
  - d) program quality. Specifically:**
    - (1) Residents and faculty must have the opportunity to evaluate the program confidentially and in writing at least annually, and**
    - (2) The program must use the results of residents' assessments of the program together with other**

**program evaluation results to improve the program.**

- 2. If deficiencies are found, the program should prepare a written plan of action to document initiatives to improve performance in the areas listed in section V.C.1. The action plan should be reviewed and approved by the teaching faculty and documented in meeting minutes.**
- 3. The number of residents completing training and taking and passing the certification examinations will be part of the Review Committee's evaluation of the program. All residents must pass the ABNS primary examination before completing the program.**

## **VI. Resident Duty Hours in the Learning and Working Environment**

### **A. Principles**

- 1. The program must be committed to and be responsible for promoting patient safety and resident well-being and to providing a supportive educational environment.**
- 2. The learning objectives of the program must not be compromised by excessive reliance on residents to fulfill service obligations.**
- 3. Didactic and clinical education must have priority in the allotment of residents' time and energy.**
- 4. Duty hour assignments must recognize that faculty and residents collectively have responsibility for the safety and welfare of patients.**

### **B. Supervision of Residents**

**The program must ensure that qualified faculty provide appropriate supervision of residents in patient care activities.**

### **C. Fatigue**

**Faculty and residents must be educated to recognize the signs of fatigue and sleep deprivation and must adopt and apply policies to prevent and counteract its potential negative effects on patient care and learning.**

**D. Duty Hours (the terms in this section are defined in the ACGME Glossary and apply to all programs)**

**Duty hours are defined as all clinical and academic activities related to the program; i.e., patient care (both inpatient and outpatient), administrative duties relative to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled activities, such as conferences. Duty hours do *not* include reading and preparation time spent away from the duty site.**

- 1. Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities.**
- 2. Residents must be provided with one day in seven free from all educational and clinical responsibilities, averaged over a four-week period, inclusive of call.**
- 3. Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call.**

**E. On-call Activities**

- 1. In-house call must occur no more frequently than every third night, averaged over a four-week period.**
- 2. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Residents may remain on duty for up to six additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care.**
- 3. No new patients may be accepted after 24 hours of continuous duty.**
  - a) A new patient is defined as any patient for whom the resident has not previously provided care.**
- 4. At-home call (or pager call)**
  - a) The frequency of at-home call is not subject to the every-third-night, or 24+6 limitation. However at-home call must not be so frequent as to preclude rest and reasonable personal time for each resident.**
  - b) Residents taking at-home call must be provided with**

one day in seven completely free from all educational and clinical responsibilities, averaged over a four-week period.

- c) When residents are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit.

#### **F. Moonlighting**

1. Moonlighting must not interfere with the ability of the resident to achieve the goals and objectives of the educational program.
2. Internal moonlighting must be considered part of the 80-hour weekly limit on duty hours.

#### **G. Duty Hours Exceptions**

A Review Committee may grant exceptions for up to 10% or a maximum of 88 hours to individual programs based on a sound educational rationale.

1. In preparing a request for an exception the program director must follow the duty hour exception policy from the ACGME Manual on Policies and Procedures.
2. Prior to submitting the request to the Review Committee, the program director must obtain approval of the institution's GMEC and DIO.

### **VII. Experimentation and Innovation**

Requests for experimentation or innovative projects that may deviate from the institutional, common and/or specialty specific program requirements must be approved in advance by the Review Committee. In preparing requests, the program director must follow Procedures for Approving Proposals for Experimentation or Innovative Projects located in the ACGME Manual on Policies and Procedures. Once a Review Committee approves a project, the sponsoring institution and program are jointly responsible for the quality of education offered to residents for the duration of such a project.

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