ACGME Program Requirements for Graduate Medical Education in Neurological Surgery

Common Program Requirements are in BOLD

Effective: July 1, 2009

Introduction

Int.A. **Residency is an essential dimension of the transformation of the medical student to the independent practitioner along the continuum of medical education. It is physically, emotionally, and intellectually demanding, and requires longitudinally-concentrated effort on the part of the resident.**

The specialty education of physicians to practice independently is experiential, and necessarily occurs within the context of the health care delivery system. Developing the skills, knowledge, and attitudes leading to proficiency in all the domains of clinical competency requires the resident physician to assume personal responsibility for the care of individual patients. For the resident, the essential learning activity is interaction with patients under the guidance and supervision of faculty members who give value, context, and meaning to those interactions. As residents gain experience and demonstrate growth in their ability to care for patients, they assume roles that permit them to exercise those skills with greater independence. This concept—graded and progressive responsibility—is one of the core tenets of American graduate medical education. Supervision in the setting of graduate medical education has the goals of assuring the provision of safe and effective care to the individual patient; assuring each resident's development of the skills, knowledge, and attitudes required to enter the unsupervised practice of medicine; and establishing a foundation for continued professional growth.

Int.B. Definition of Discipline

Neurological surgery is a discipline of medicine and the specialty of surgery that provides operative and nonoperative management (i.e., prevention, diagnosis, evaluation, interpretation of imaging, treatment, critical care, and rehabilitation) of disorders of the central, peripheral, and autonomic nervous systems, including their supporting structures and vascular supply; the evaluation and treatment of pathological processes that modify the function or activity of the nervous system, including the hypophysis; and the operative and non-operative management of pain. As such, Neurological surgery encompasses:

Int.B.1. the surgical, nonsurgical and stereotactic radiosurgical treatment of adult and pediatric patients with disorders of the nervous system;

Int.B.2. 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;

Int.B.3. disorders of the pituitary gland;

Int.B.4. disorders of the spinal cord, meninges, and vertebral column, including those that may require treatment by fusion, instrumentation, or endovascular techniques; and,

Int.B.5. disorders of the cranial, peripheral, and spinal nerves throughout their distribution.

Int.C. Duration and Scope of Education

Int.C.1. The required length of a neurological surgery residency is 72 months in a curriculum under the control of the neurological surgery program director. The Review Committee recognizes two educational formats: PGY 1-6 and PGY 1-7. Programs can be approved for up to 84 months of neurological surgery training, 72 months of which are for clinical and didactic education and 12 months of research or advanced training. The resident must complete all years of education for which the program is accredited.

Int.C.2. The year of fundamental skills (PGY1) must be organized so that residents participate in clinical and didactic activities to:

Int.C.2.a) develop the knowledge, attitudes and skills needed to formulate principles and assess, plan, and initiate treatment of patients with surgical and medical problems;

Int.C.2.b) be involved in the care of patients with surgical and medical emergencies, multiple organ system trauma, and nervous system injuries and diseases;

Int.C.2.c) gain experience in the care of critically ill surgical and medical patients;

Int.C.2.d) participate in the pre-, intra-, and post-operative care of surgical patients; and,

Int.C.2.e) develop basic surgical skills and an understanding of surgical anesthesia, including anesthetic risks and the management of intra-operative anesthetic complications.

Int.C.3. Programs that extend the residency beyond 72 months must present a clear educational rationale consonant with the program requirements and the objectives of the residency. The program director must obtain the approval of the sponsoring institution and the Review Committee prior to implementation and at each subsequent accreditation review of the program.

Int.C.4. Before entry into the program, each resident must be notified in writing of the required length of the program. This period may not be changed for a particular resident during his or her program unless there is a significant break in his or her education, or the resident needs remedial education.

Int.C.5. Residents must have a minimum of three months of structured education in general patient care to include rotations in surgery, critical care, trauma, and other related rotations as determined by the program director.

Int.C.5.a) Residents should have a maximum of six months of neurological surgery.

Int.C.6. During the first 36 months of education residents must have a minimum of three months of structured education in an ACGME-accredited neurology program.

Int.C.7. The program must provide 42 months of clinical neurological surgery at the sponsoring institution or one of its approved participating sites. A minimum of 21 months of neurological surgery education must occur at the sponsoring institution.

Int.C.8. The remaining time not devoted to clinical neurology and neurological surgery 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.

Int.C.9. The program must provide residents with experience in direct and progressively responsible patient management experience as they advance through training.

Int.C.10. 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.

Int.C.10.a) The chief resident must have major or primary responsibility for patient management with faculty supervision.

Int.C.10.b) The chief resident should also have administrative responsibility as designated by the program director.

Int.C.10.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.

I. Institutions

I.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.

I.A.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.

I.B. Participating Sites

I.B.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:

I.B.1.a) identify the faculty who will assume both educational and supervisory responsibilities for residents;

I.B.1.b) specify their responsibilities for teaching, supervision, and formal evaluation of residents, as specified later in this document;

I.B.1.c) specify the duration and content of the educational experience; and,

I.B.1.d) state the policies and procedures that will govern resident education during the assignment.

I.B.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).

I.B.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.

I.B.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

II.A. Program Director

II.A.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.**

II.A.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.**

II.A.3. **Qualifications of the program director must include:**

II.A.3.a) **requisite specialty expertise and documented educational and administrative experience acceptable to the Review Committee;**

II.A.3.b) **current certification in the specialty by the American Board of** Neurological Surgery**, or specialty qualifications that are acceptable to the Review Committee; and,**

II.A.3.c) **current medical licensure and appropriate medical staff appointment.**

II.A.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:**

II.A.4.a) **oversee and ensure the quality of didactic and clinical education in all sites that participate in the program;**

II.A.4.b) **approve a local director at each participating site who is accountable for resident education;**

II.A.4.c) **approve the selection of program faculty as appropriate;**

II.A.4.d) **evaluate program faculty and approve the continued participation of program faculty based on evaluation;**

II.A.4.e) **monitor resident supervision at all participating sites;**

II.A.4.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;

II.A.4.g)	**provide each resident with documented semiannual evaluation of performance with feedback;**
II.A.4.h)	**ensure compliance with grievance and due process procedures as set forth in the Institutional Requirements and implemented by the sponsoring institution;**
II.A.4.i)	**provide verification of residency education for all residents, including those who leave the program prior to completion;**
II.A.4.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:**
II.A.4.j).(1)	**distribute these policies and procedures to the residents and faculty;**
II.A.4.j).(2)	**monitor resident duty hours, according to sponsoring institutional policies, with a frequency sufficient to ensure compliance with ACGME requirements;**
II.A.4.j).(3)	**adjust schedules as necessary to mitigate excessive service demands and/or fatigue; and,**
II.A.4.j).(4)	**if applicable, monitor the demands of at-home call and adjust schedules as necessary to mitigate excessive service demands and/or fatigue.**
II.A.4.k)	**monitor the need for and ensure the provision of back up support systems when patient care responsibilities are unusually difficult or prolonged;**
II.A.4.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;**
II.A.4.m)	**be familiar with and comply with ACGME and Review Committee policies and procedures as outlined in the ACGME Manual of Policies and Procedures;**
II.A.4.n)	**obtain review and approval of the sponsoring institution's GMEC/DIO before submitting to the ACGME information or requests for the following:**
II.A.4.n).(1)	**all applications for ACGME accreditation of new programs;**

II.A.4.n).(2) **changes in resident complement;**

II.A.4.n).(3) **major changes in program structure or length of training;**

II.A.4.n).(4) **progress reports requested by the Review Committee;**

II.A.4.n).(5) **responses to all proposed adverse actions;**

II.A.4.n).(6) **requests for increases or any change to resident duty hours;**

II.A.4.n).(7) **voluntary withdrawals of ACGME-accredited programs;**

II.A.4.n).(8) **requests for appeal of an adverse action;**

II.A.4.n).(9) **appeal presentations to a Board of Appeal or the ACGME; and,**

II.A.4.n).(10) **proposals to ACGME for approval of innovative educational approaches.**

II.A.4.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:**

II.A.4.o).(1) **program citations, and/or**

II.A.4.o).(2) **request for changes in the program that would have significant impact, including financial, on the program or institution.**

II.A.4.p) obtain Review Committee approval for the addition or deletion of any participating site rotation;

II.A.4.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;

II.A.4.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;

II.A.4.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;

II.A.4.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;

II.A.4.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;

II.A.4.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,

II.A.4.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.

II.B. Faculty

II.B.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:

II.B.1.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

II.B.1.b) administer and maintain an educational environment conducive to educating residents in each of the ACGME competency areas.

II.B.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.**

II.B.2.a) Neurological surgery faculty participation in undergraduate medical education is desirable.

II.B.2.b) There should be a minimum faculty of three neurological surgeons at the primary teaching site.

II.B.2.c) Training directors at participating sites

II.B.2.c).(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.

II.B.2.c).(2) These appointments will generally be for a one-year period and can be renewable to ensure continuity of leadership.

II.B.2.c).(3) The training director in neurological surgery at each participating site must have major clinical responsibilities at that site.

II.B.2.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.

II.B.2.e) When a change in chairmanship occurs within an accredited neurological surgery training program, the program must be site-visited within two years.

II.B.3. The physician faculty must possess current medical licensure and appropriate medical staff appointment.

II.B.4. The nonphysician faculty must have appropriate qualifications in their field and hold appropriate institutional appointments.

II.B.5. The faculty must establish and maintain an environment of inquiry and scholarship with an active research component.

II.B.5.a) The faculty must regularly participate in organized clinical discussions, rounds, journal clubs, and conferences.

II.B.5.b) Some members of the faculty should also demonstrate scholarship by one or more of the following:

II.B.5.b).(1) peer-reviewed funding;

II.B.5.b).(2) **publication of original research or review articles in peer-reviewed journals, or chapters in textbooks;**

II.B.5.b).(3) **publication or presentation of case reports or clinical series at local, regional, or national professional and scientific society meetings; or,**

II.B.5.b).(4) **participation in national committees or educational organizations.**

II.B.5.c) **Faculty should encourage and support residents in scholarly activities.**

II.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.

II.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.

II.D.1. Inpatient facilities

II.D.1.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.

II.D.1.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.

II.D.1.c) Similarly, neurological surgery beds should be on a unit designated for the care of neurological surgery patients.

II.D.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.

II.D.3. Research Facilities

II.D.3.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.

II.D.3.b) Clinical and/or basic research opportunities should be available to the neurological surgery resident with appropriate faculty supervision.

II.D.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.

II.D.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.

II.D.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.

II.D.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.

II.D.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.

II.D.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.

II.D.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.

II.D.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.

II.D.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.

II.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

III.A. Eligibility Criteria

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

III.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.

III.B.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.

III.B.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 Graduate Medical Education in Neurological Surgery. In determining the size of a resident complement, the Review Committee will consider the following:

III.B.2.a) presence of a faculty of national stature in neurological surgery;

III.B.2.b) quality of the educational program;

III.B.2.c) quality of clinical care;

III.B.2.d) total number and distribution of cases;

III.B.2.e) quality of clinical and basic research;

III.B.2.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,

III.B.2.g) facilities.

III.B.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.

III.C. Resident Transfers

III.C.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.

III.C.2. A program director must provide timely verification of residency education and summative performance evaluations for residents who leave the program prior to completion.

III.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.

III.D.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.

III.D.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

IV.A. The curriculum must contain the following educational components:

IV.A.1. Overall educational goals for the program, which the program must distribute to residents and faculty annually;

IV.A.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;

IV.A.3. Regularly scheduled didactic sessions;

IV.A.4. Delineation of resident responsibilities for patient care, progressive responsibility for patient management, and supervision of residents over the continuum of the program; and,

IV.A.5. ACGME Competencies

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

IV.A.5.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:

IV.A.5.a).(1) are expected to gather and understand essential patient information in a timely manner;

IV.A.5.a).(2) are expected to generate an appropriate differential diagnosis;

IV.A.5.a).(3) are expected to implement an effective plan of management;

IV.A.5.a).(4) are expected to prioritize and stabilize multiple patients simultaneously;

IV.A.5.a).(5) are expected to competently perform neurosurgical operative procedures;

IV.A.5.a).(6) are expected to manage complications;

IV.A.5.a).(7) are expected to analyze outcomes;

IV.A.5.a).(8) are expected to counsel and educate patients and families;

IV.A.5.a).(9) are expected to provide health care services aimed at preventing health problems and maintaining health;

IV.A.5.a).(10) are expected to work with health care professionals to provide patient-focused care;

IV.A.5.a).(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,

IV.A.5.a).(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.

IV.A.5.a).(12).(a) Resident participation in and responsibility for operative procedures embracing the entire neurosurgical spectrum should increase progressively throughout the training period.

IV.A.5.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:

IV.A.5.b).(1) are expected to generate a differential diagnosis and properly sequence critical actions for patient care, including management complications, morbidity and mortality;

IV.A.5.b).(2) are expected to synthesize and properly utilize acquired patient data;

IV.A.5.b).(3) are expected to identify neurosurgical emergencies;

IV.A.5.b).(4) are expected to know how to access current medical information;

IV.A.5.b).(5) are expected to understand how to treat neurosurgical conditions;

IV.A.5.b).(6) are expected to incorporate evidence-based principles;

IV.A.5.b).(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,

IV.A.5.b).(8) must have experience and instruction in the basic neurosciences.

IV.A.5.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:

IV.A.5.c).(1) identify strengths, deficiencies, and limits in one's knowledge and expertise;

IV.A.5.c).(2) set learning and improvement goals;

IV.A.5.c).(3) identify and perform appropriate learning activities;

IV.A.5.c).(4) systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;

IV.A.5.c).(5) incorporate formative evaluation feedback into daily practice;

IV.A.5.c).(6) locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;

IV.A.5.c).(7) use information technology to optimize learning; and,

IV.A.5.c).(8) participate in the education of patients, families, students, residents and other health professionals.

IV.A.5.c).(9) apply knowledge of study design and statistical methods to critically appraise the medical literature;

IV.A.5.c).(10) Facilitate the learning of students and other health care professionals

IV.A.5.c).(10).(a) Resident participation in undergraduate medical education is desirable.

IV.A.5.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:

IV.A.5.d).(1) communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;

IV.A.5.d).(2) communicate effectively with physicians, other health professionals, and health related agencies;

IV.A.5.d).(3) work effectively as a member or leader of a health care team or other professional group;

IV.A.5.d).(4) act in a consultative role to other physicians and health professionals; and,

IV.A.5.d).(5) maintain comprehensive, timely, and legible medical records, if applicable.

IV.A.5.d).(6) develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;

IV.A.5.d).(7) develop effective written communication skills;

IV.A.5.d).(8) involve patients in medical decisions; and,

IV.A.5.d).(9) strengthen listening and non-verbal communication skills.

IV.A.5.e) Professionalism

IV.A.5.f) Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

IV.A.5.f).(1) compassion, integrity, and respect for others;

IV.A.5.f).(2) **responsiveness to patient needs that supersedes self-interest;**

IV.A.5.f).(3) **respect for patient privacy and autonomy;**

IV.A.5.f).(4) **accountability to patients, society and the profession; and,**

IV.A.5.f).(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.**

IV.A.5.f).(6) treat patients/family/staff/ paraprofessional personnel with respect;

IV.A.5.f).(7) demonstrate sensitivity to patient's pain, emotional state, and gender/ethnicity issues;

IV.A.5.f).(8) discuss death honestly, sensitively, patiently, and compassionately;

IV.A.5.f).(9) exemplify integrity;

IV.A.5.f).(10) accept responsibility/accountability;

IV.A.5.f).(11) demonstrate reliability;

IV.A.5.f).(12) maintain calm, even temperament;

IV.A.5.f).(13) exhibit self-awareness and knowledge of limits;

IV.A.5.f).(14) respond to the comments of other team members, patients, families, and peers openly and responsibly; and,

IV.A.5.f).(14).(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.

IV.A.5.g) **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:

IV.A.5.g).(1) **work effectively in various health care delivery settings and systems relevant to their clinical specialty;**

IV.A.5.g).(2) **coordinate patient care within the health care system relevant to their clinical specialty;**

IV.A.5.g).(3) **incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;**

IV.A.5.g).(4) **advocate for quality patient care and optimal patient care systems;**

IV.A.5.g).(5) **work in interprofessional teams to enhance patient safety and improve patient care quality; and,**

IV.A.5.g).(6) **participate in identifying system errors and implementing potential systems solutions.**

IV.A.5.g).(7) understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal neurosurgical care;

IV.A.5.g).(8) understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;

IV.A.5.g).(9) practice cost-effective health care and resource allocation that does not compromise quality of care;

IV.A.5.g).(10) advocate, coordinate, and facilitate patient care; and,

IV.A.5.g).(11) understand principles of and advance practices for patient safety at the institutional and individual level.

IV.B. Residents' Scholarly Activities

IV.B.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.**

IV.B.2. **Residents should participate in scholarly activity.**

IV.B.2.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.

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

V. Evaluation

V.A. Resident Evaluation

V.A.1. Formative Evaluation

V.A.1.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.**

V.A.1.b) **The program must:**

V.A.1.b).(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;**

V.A.1.b).(2) **use multiple evaluators (e.g., faculty, peers, patients, self, and other professional staff);**

V.A.1.b).(3) **document progressive resident performance improvement appropriate to educational level; and,**

V.A.1.b).(4) **provide each resident with documented semiannual evaluation of performance with feedback.**

V.A.1.c) **The evaluations of resident performance must be accessible for review by the resident, in accordance with institutional policy.**

V.A.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:

V.A.2.a) **document the resident's performance during the final period of education, and**

V.A.2.b) **verify that the resident has demonstrated sufficient competence to enter practice without direct supervision.**

V.B. Faculty Evaluation

V.B.1. At least annually, the program must evaluate faculty performance as it relates to the educational program.

V.B.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.

V.B.3. This evaluation must include at least annual written confidential evaluations by the residents.

V.C. Program Evaluation and Improvement

V.C.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:

V.C.1.a) resident performance;

V.C.1.b) faculty development;

V.C.1.c) graduate performance, including performance of program graduates on the certification examination; and,

V.C.1.d) program quality. Specifically:

V.C.1.d).(1) Residents and faculty must have the opportunity to evaluate the program confidentially and in writing at least annually, and

V.C.1.d).(2) The program must use the results of residents' assessments of the program together with other program evaluation results to improve the program.

V.C.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.

V.C.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

VI.A. Professionalism, Personal Responsibility, and Patient Safety

VI.A.1.	**Programs and sponsoring institutions must educate residents and faculty members concerning the professional responsibilities of physicians to appear for duty appropriately rested and fit to provide the services required by their patients.**
VI.A.2.	**The program must be committed to and responsible for promoting patient safety and resident well-being in a supportive educational environment.**
VI.A.3.	**The program director must ensure that residents are integrated and actively participate in interdisciplinary clinical quality improvement and patient safety programs.**
VI.A.4.	**The learning objectives of the program must:**
VI.A.4.a)	**be accomplished through an appropriate blend of supervised patient care responsibilities, clinical teaching, and didactic educational events; and,**
VI.A.4.b)	**not be compromised by excessive reliance on residents to fulfill non-physician service obligations.**
VI.A.5.	**The program director and institution must ensure a culture of professionalism that supports patient safety and personal responsibility. Residents and faculty members must demonstrate an understanding and acceptance of their personal role in the following:**
VI.A.5.a)	**assurance of the safety and welfare of patients entrusted to their care;**
VI.A.5.b)	**provision of patient- and family-centered care;**
VI.A.5.c)	**assurance of their fitness for duty;**
VI.A.5.d)	**management of their time before, during, and after clinical assignments;**
VI.A.5.e)	**recognition of impairment, including illness and fatigue, in themselves and in their peers;**
VI.A.5.f)	**attention to lifelong learning;**
VI.A.5.g)	**the monitoring of their patient care performance improvement indicators; and,**
VI.A.5.h)	**honest and accurate reporting of duty hours, patient outcomes, and clinical experience data.**
VI.A.6.	**All residents and faculty members must demonstrate responsiveness to patient needs that supersedes self-interest.**

Physicians must recognize that under certain circumstances, the best interests of the patient may be served by transitioning that patient's care to another qualified and rested provider.

VI.B. Transitions of Care

VI.B.1. Programs must design clinical assignments to minimize the number of transitions in patient care.

VI.B.2. Sponsoring institutions and programs must ensure and monitor effective, structured hand-over processes to facilitate both continuity of care and patient safety.

VI.B.3. Programs must ensure that residents are competent in communicating with team members in the hand-over process.

VI.B.4. The sponsoring institution must ensure the availability of schedules that inform all members of the health care team of attending physicians and residents currently responsible for each patient's care.

VI.C. Alertness Management/Fatigue Mitigation

VI.C.1. The program must:

VI.C.1.a) educate all faculty members and residents to recognize the signs of fatigue and sleep deprivation;

VI.C.1.b) educate all faculty members and residents in alertness management and fatigue mitigation processes; and,

VI.C.1.c) adopt fatigue mitigation processes to manage the potential negative effects of fatigue on patient care and learning, such as naps or back-up call schedules.

VI.C.2. Each program must have a process to ensure continuity of patient care in the event that a resident may be unable to perform his/her patient care duties.

VI.C.3. The sponsoring institution must provide adequate sleep facilities and/or safe transportation options for residents who may be too fatigued to safely return home.

VI.D. Supervision of Residents

VI.D.1. In the clinical learning environment, each patient must have an identifiable, appropriately-credentialed and privileged attending physician (or licensed independent practitioner as approved by each Review Committee) who is ultimately responsible for that patient's care.

VI.D.1.a) This information should be available to residents, faculty members, and patients.

VI.D.1.b) Residents and faculty members should inform patients of their respective roles in each patient's care.

VI.D.2. The program must demonstrate that the appropriate level of supervision is in place for all residents who care for patients.

Supervision may be exercised through a variety of methods. Some activities require the physical presence of the supervising faculty member. For many aspects of patient care, the supervising physician may be a more advanced resident or fellow. Other portions of care provided by the resident can be adequately supervised by the immediate availability of the supervising faculty member or resident physician, either in the institution, or by means of telephonic and/or electronic modalities. In some circumstances, supervision may include post-hoc review of resident-delivered care with feedback as to the appropriateness of that care.

VI.D.3. Levels of Supervision

To ensure oversight of resident supervision and graded authority and responsibility, the program must use the following classification of supervision:

VI.D.3.a) Direct Supervision – the supervising physician is physically present with the resident and patient.

VI.D.3.b) Indirect Supervision:

VI.D.3.b).(1) with direct supervision immediately available – the supervising physician is physically within the hospital or other site of patient care, and is immediately available to provide Direct Supervision.

VI.D.3.b).(2) with direct supervision available – the supervising physician is not physically present within the hospital or other site of patient care, but is immediately available by means of telephonic and/or electronic modalities, and is available to provide Direct Supervision.

VI.D.3.c) Oversight – the supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered.

VI.D.4. The privilege of progressive authority and responsibility, conditional independence, and a supervisory role in patient care delegated to each resident must be assigned by the program director and faculty members.

VI.D.4.a) **The program director must evaluate each resident's abilities based on specific criteria. When available, evaluation should be guided by specific national standards-based criteria.**

VI.D.4.b) **Faculty members functioning as supervising physicians should delegate portions of care to residents, based on the needs of the patient and the skills of the residents.**

VI.D.4.c) **Senior residents or fellows should serve in a supervisory role of junior residents in recognition of their progress toward independence, based on the needs of each patient and the skills of the individual resident or fellow.**

VI.D.5. **Programs must set guidelines for circumstances and events in which residents must communicate with appropriate supervising faculty members, such as the transfer of a patient to an intensive care unit, or end-of-life decisions.**

VI.D.5.a) **Each resident must know the limits of his/her scope of authority, and the circumstances under which he/she is permitted to act with conditional independence.**

VI.D.5.a).(1) **In particular, PGY-1 residents should be supervised either directly or indirectly with direct supervision immediately available.**

VI.D.6. **Faculty supervision assignments should be of sufficient duration to assess the knowledge and skills of each resident and delegate to him/her the appropriate level of patient care authority and responsibility.**

VI.E. **Clinical Responsibilities**

The clinical responsibilities for each resident must be based on PGY-level, patient safety, resident education, severity and complexity of patient illness/condition and available support services.

VI.F. **Teamwork**

Residents must care for patients in an environment that maximizes effective communication. This must include the opportunity to work as a member of effective interprofessional teams that are appropriate to the delivery of care in the specialty.

VI.G. **Resident Duty Hours**

VI.G.1. **Maximum Hours of Work per Week**

Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities and all

moonlighting.

VI.G.1.a) Duty Hour 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.

VI.G.1.a).(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.

VI.G.1.a).(2) Prior to submitting the request to the Review Committee, the program director must obtain approval of the institution's GMEC and DIO.

VI.G.2. Moonlighting

VI.G.2.a) Moonlighting must not interfere with the ability of the resident to achieve the goals and objectives of the educational program.

VI.G.2.b) Time spent by residents in Internal and External Moonlighting (as defined in the ACGME Glossary of Terms) must be counted towards the 80-hour Maximum Weekly Hour Limit.

VI.G.2.c) PGY-1 residents are not permitted to moonlight.

VI.G.3. Mandatory Time Free of Duty

Residents must be scheduled for a minimum of one day free of duty every week (when averaged over four weeks). At-home call cannot be assigned on these free days.

VI.G.4. Maximum Duty Period Length

VI.G.4.a) Duty periods of PGY-1 residents must not exceed 16 hours in duration.

VI.G.4.b) Duty periods of PGY-2 residents and above may be scheduled to a maximum of 24 hours of continuous duty in the hospital. Programs must encourage residents to use alertness management strategies in the context of patient care responsibilities. Strategic napping, especially after 16 hours of continuous duty and between the hours of 10:00 p.m. and 8:00 a.m., is strongly suggested.

VI.G.4.b).(1) It is essential for patient safety and resident education that effective transitions in care occur. Residents may be allowed to remain on-site in order to accomplish these tasks; however, this period of time must be no

longer than an additional four hours.

VI.G.4.b).(2) **Residents must not be assigned additional clinical responsibilities after 24 hours of continuous in-house duty.**

VI.G.4.b).(3) **In unusual circumstances, residents, on their own initiative, may remain beyond their scheduled period of duty to continue to provide care to a single patient. Justifications for such extensions of duty are limited to reasons of required continuity for a severely ill or unstable patient, academic importance of the events transpiring, or humanistic attention to the needs of a patient or family.**

VI.G.4.b).(3).(a) **Under those circumstances, the resident must:**

VI.G.4.b).(3).(a).(i) **appropriately hand over the care of all other patients to the team responsible for their continuing care; and,**

VI.G.4.b).(3).(a).(ii) **document the reasons for remaining to care for the patient in question and submit that documentation in every circumstance to the program director.**

VI.G.4.b).(3).(b) **The program director must review each submission of additional service, and track both individual resident and program-wide episodes of additional duty.**

VI.G.5. **Minimum Time Off between Scheduled Duty Periods**

VI.G.5.a) **PGY-1 residents should have 10 hours, and must have eight hours, free of duty between scheduled duty periods.**

VI.G.5.b) **Intermediate-level residents should have 10 hours free of duty, and must have eight hours between scheduled duty periods. They must have at least 14 hours free of duty after 24 hours of in-house duty.**

PGY-2 residents are considered to be at the intermediate level.

VI.G.5.c) **Residents in the final years of education must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods.**

Residents at the PGY-3 level and beyond are considered to be in the final years of education.

VI.G.5.c).(1) **This preparation must occur within the context of the**

80-hour, maximum duty period length, and one-day-off-in-seven standards. While it is desirable that residents in their final years of education have eight hours free of duty between scheduled duty periods, there may be circumstances [when these residents must stay on duty to care for their patients or return to the hospital with fewer than eight hours free of duty.

VI.G.5.c).(1).(a) **Circumstances of return-to-hospital activities with fewer than eight hours away from the hospital by residents in their final years of education must be monitored by the program director.**

VI.G.5.c).(1).(b) Residents at the PGY-3 level or beyond may stay on duty or return to the hospital with fewer than eight hours free of duty under specific circumstances.

VI.G.5.c).(1).(c) The Review Committee defines such circumstances as: required continuity of care for a severely ill or unstable patient, or a complex patient with whom the resident has been involved; events of exceptional educational value; or, humanistic attention to the needs of a patient or family.

VI.G.6. **Maximum Frequency of In-House Night Float**

Residents must not be scheduled for more than six consecutive nights of night float.

VI.G.6.a) Night float should be limited to four months per year, and must not exceed six months per year.

VI.G.7. **Maximum In-House On-Call Frequency**

PGY-2 residents and above must be scheduled for in-house call no more frequently than every-third-night (when averaged over a four-week period).

VI.G.8. **At-Home Call**

VI.G.8.a) **Time spent in the hospital by residents on at-home call must count towards the 80-hour maximum weekly hour limit. The frequency of at-home call is not subject to the every-third-night limitation, but must satisfy the requirement for one-day-in-seven free of duty, when averaged over four weeks.**

VI.G.8.a).(1) **At-home call must not be so frequent or taxing as to preclude rest or reasonable personal time for each resident.**

VI.G.8.b) **Residents are permitted to return to the hospital while on at-home call to care for new or established patients. Each episode of this type of care, while it must be included in the 80-hour weekly maximum, will not initiate a new "off-duty period".**

VII. Innovative Projects

Requests for 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 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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