



CAST PROGRAM REQUIREMENTS FOR FELLOWSHIP EDUCATION IN NEUROCRITICAL CARE

INTRODUCTION

- Eligibility
 - Fellowship programs which exist within the structure of an ACGME accredited residency in neurological surgery and are appropriately organized for the conduct of graduate medical education (GME) in a scholarly environment may apply for accreditation through the Committee on Accreditation of Subspecialty Training of The Society of Neurological Surgeons (CAST).
- Definition and Scope of the Subspecialty
 - Neurocritical care involves the comprehensive care of critically ill neurological patients. The ultimate goals of neurocritical care are to resuscitate and treat whole-body systems to maximize the healing milieu (and therefore outcomes) of the neurological patient. This is accomplished by providing appropriate therapies to treat primary injuries and illnesses, minimizing secondary neurological injury and providing neuroprotection, preventing medical and surgical complications, and facilitating the transition to other recovery environments along the continuum of care.
 - Neurocritical care specialists or neurointensivists manage the full spectrum of critical care diagnosis and management including multi- system organ dysfunction and have additional special expertise in central and peripheral nervous system physiology, diagnosis, and management. These individuals may have primary training in a variety of medical disciplines, including neurological surgery, neurology, anesthesiology, emergency medicine, internal medicine and pulmonology, surgery or other disciplines. Expertise in neurocritical care, however, supersedes primary training, and includes proficiency with standard forms of intensive care unit (ICU) monitoring (e.g., cardiovascular hemodynamic monitoring and mechanical ventilation), as well as specialized forms of neurological monitoring (e.g., intracranial pressure and other forms of invasive neuromonitoring and continuous EEG monitoring) and interventions for neuroprotection (e.g., therapeutic hypothermia and induced pharmacological coma).
 - Neurointensivists collaborate closely with other medical specialists in the multi-disciplinary management of patients, and with other professions (nursing, pharmacology, rehabilitative therapies, social work, etc.) for interprofessional team-based patient-centered care. Programmatic development for care improvements using evidentiary bases, consensus, and best practices, while still providing individualized care based upon patient physiology and

treatment goals, is a key element of neurocritical care. Although neurosurgical residency provides extensive exposure to neurocritical care throughout the training experience and encompasses requirements for core competencies necessary to manage the neurological elements of most neurosurgical patients, additional focused training in neurocritical care is available. The aims of SNS-CAST fellowships in neurocritical care are to provide sufficient expertise in the primary management of all aspects of care, including pulmonary, cardiac, renal, gastrointestinal, hematological, infectious, and other systemic problems. Therefore, additional training experiences are provided in the context of SNS- CAST accredited programs to ensure that the neurosurgical neurointensivist is well-prepared to address all aspects of medical management and nervous system pathophysiology.

- Requirements for SNS-CAST fellowship training programs in neurocritical care include training environments and resources of sufficient breadth and depth to confer the clinical knowledge, decision-making, and procedural skills needed to develop advanced proficiency. Additionally, trainees must be provided with education necessary to facilitate the administrative supervision of neurocritical care units and to provide education to trainees at all levels in neurocritical care

DURATION/TIMING OF TRAINING

- Post-graduate (post-residency) fellowships:
 - Prior to beginning a CAST accredited neurological surgery subspecialty fellowship, each fellow candidate must have satisfactorily completed an ACGME or a foreign equivalent accredited residency training program.
 - The length of fellowship will be twelve (12) months duration.
 - A CAST accredited program may not offer a fellowship position to a potential fellow until that fellow has completed their PGY3 year.
 - If the subspecialty is part of the match, it is required that programs and fellows participate according to that match's guidelines.
- Enfolded Fellowships:
 - Given the extensive duration of exposure to neurocritical care and required competencies to be obtained during neurosurgery residency, SNS-CAST fellowships may be completed in an “enfolded” fashion, i.e., completed within the seven-year course neurosurgical residency
 - The length of fellowship will be twelve (12) months duration.
 - A program comprised of twelve (12) consecutive months is optimal to ensure a comprehensive and immersive exposure to all facets of neurocritical care. Experiences divided into either two 6 month or three 4 month blocks will be considered on a case-by-case basis, provided the program offers a strong rationale and assurance that the trainee's full attention will be devoted to the fellowship during those periods
 - Because the first three years of residency training are considered to be foundational experiences, enfolded fellowships may commence only at the PGY4 or above training year.

- General Description of the Objectives/Goals of Education in the Fellowship
 - The fellowship training must provide broad educational experience in neurocritical care that will complement that training in the residency to promote further acquisition of knowledge and skills in the subspecialty.
 - Research constitutes an integral component of educational experience and provisions should be existent for the successful completion of research projects. There should be evidence of ongoing scholarship by both trainees and faculty of the fellowship.
 - The scholarship of discovery is evidenced by peer reviewed funding or publication of original research.
 - The scholarship of dissemination is evidenced by publication of book chapters, review articles, best practices, guidelines, and other forms of medical communication.
 - The scholarship of application is evidenced by the publication or presentation of specialty-specific educational information at local, regional, or national professional and scientific society meetings.
 - Regular participation of the faculty in clinical discussions, rounds, journal clubs, educational and research conferences, quality assessments and peer review, and the like, all to be done in a manner that promotes a spirit of inquiry and scholarship
 - Faculty should offer regular guidance and technical support for residents and fellows involved in research, such as research design and methods, statistical analysis, scientific communication, and other key elements.
 - Each fellow is expected to participate in some form of scholarly activity throughout the duration of their training period, regardless of block structure.
 - Fellows are expected to participate in the teaching of neurocritical care skills to more junior or less experienced residents, APPs, nurses, and other colleagues.
- Program Requirements
 - Training must involve advanced educational and clinical activities related to the care of critically ill patients including but not limited to neurological and neurosurgical patients. During these training blocks, neurosurgical residents and fellows should not routinely be engaged in operative care of patients beyond intensive care procedures (e.g., tracheostomy, intracranial monitoring). Training should be dedicated to maintaining a continuous presence in the ICU except for night and weekend on-call experiences in surgery.
 - The fellowship 12-month experience must include rotations in ICUs other than the Neuro ICU. The new application and yearly annual report should specify clearly the type of ICU or other associated critical care experience (Anesthesia EEG, etc.) for each rotation and be described in detail in the block diagram and fellow schedule:
 - Minimum of 6 months of Neuro ICU rotations
 - Minimum of 3 months of non-Neuro ICU rotations (Trauma ICU, Surgical ICU, Medical ICU, etc.)
 - Remaining 3 months can be used for research, electives (Anesthesia, Neurodiagnostics, etc.) or additional ICU time
 - Educational rationales for each must be submitted for initial and renewal applications and for any significant changes in block design.

- Narrative description should be included to clarify the patient population cared for in a particular geographical location, particularly if the name of the ICU does not accurately reflect the range of diagnoses treated therein.
- For the purposes of this accreditation document, all neurosurgical neurocritical care trainees are designated “fellows” even though they may be participating in an enfolded fellowship experience. This is to distinguish this experience from typical resident rotations. They are further designated as “enfolded fellows” for those still in residency or “post- graduate fellows” for those who have completed residency. The terms “trainee” and “learner” are also used interchangeably to refer to the fellow regardless of level (enfolded or post-graduate).

INSTITUTIONAL ORGANIZATION

- The Sponsoring Program and Institution
 - There must be faculty, administrative and financial resources, research, and laboratory facilities to meet the educational needs of the fellowship trainee and to enable the program to comply with the requirements of accreditation.
 - Support for the fellowship program by the sponsoring department/division of neurosurgery must be demonstrated in writing by the program chair at the time of application and for renewal of accreditation via the annual report.
 - When more than one critical care program exists within an institution, it is the responsibility of the institution and its critical care program directors to promote and coordinate interdisciplinary interactions and patient care services so as to ensure that all trainees are provided an optimal educational environment consistent with specified training requirements.
- Participating Institutions
 - Participating institutions shall be limited to those able to provide an educational environment important for a meaningful fellowship experience.
 - In most instances the fellowship will occur at a single institution. Depending on local circumstances, training may be spent at additional institutions/sites which may provide special resources for training. Those sites must be within 50 miles of the primary site.
 - The primary teaching staff must be members of the faculty of the sponsoring program
 - Only one CAST approved fellowship for each subspecialty per training program will be allowed at any one time.
 - Intensive Care Units
 - The ICU environment must contain the necessary diagnostic, therapeutic and imaging equipment for fellows to gain competence in all essential core procedural competencies.
 - The critical care units must exist as distinct entities, in designated areas within the institution, constructed and designed specifically for the care of critically ill patients.
 - There must be designated space for confidential patient care conferences, sign-outs and hand-offs, and multi- and inter-disciplinary care conferences, ideally within the

neurocritical care unit itself or immediately adjacent so as to maintain the physical presence of all within the care area.

- There must be private consultation areas for in-person and telephonic/video discussions with patient families.
 - Case Mix
 - Sufficient patient volume must consistently exist for adequate training in nervous system and poly-system trauma, cerebrovascular insults and diseases, neurooncological disorders, spinal column and cord injuries and disorders, nervous system infections, disorders of cerebrospinal fluid, and other neurological problems (e.g., status epilepticus, myasthenia gravis, Guillain-Barre Syndrome, polyneuropathies, etc.) as outlined in the Neurocritical Care Curriculum. Sufficient case volumes must also include patients with respiratory failure or insufficiency, sepsis and infection, cardiac diseases and failure, renal injury and failure, hepatic dysfunction and failure, acute immunological abnormalities and other critical care problems.
 - Training must include exposure to both pediatric and adult patients, although it is expected that the majority of training will involve adult patients. Training must provide sufficient volume of those procedures that are integral to provision of critical care services.
 - Hospital General Resources
 - There must be adequate space and equipment for the educational program, including meeting rooms, classrooms with audiovisual and other educational aids, office space for staff and fellows, and access to pertinent reference materials.
 - The primary institution should provide the full gamut of services to neurological patients, including neurosurgery and neurology.
 - An active emergency room is required.
 - Around-the-clock provision of both critical care and operative services is required.
 - Specialty neuroanesthesiology services are strongly encouraged.
 - Availability of an acute stroke team is strongly encouraged.
 - Hospital Neurocritical Care Specific Resources
 - Invasive neuromonitoring, ventricular drainage, and continuous electroencephalography (EEG) capabilities are required.
 - Multi-modality neuromonitoring capabilities are strongly encouraged. Specialty nursing training in neurocritical care is required.
 - Access to all equipment and support personnel necessary to provide these services around the clock must be provided.
- Appointment of Fellows
 - In general, only one fellowship position (approved complement) per fellowship training program will be allowed; however CAST may consider a complement increase. In determining the merit of additional fellowship positions, the committee will consider:
 - The presence of a faculty of national stature in neurocritical care.
 - The quality of the educational program.
 - The quality of clinical care.
 - The total number of institutional cases potentially accessible to the fellow.
 - Submitted case numbers by graduating fellows

- The quality of clinical and research programs.
- The impact of fellows on the clinical and educational experience of the neurosurgical residents within the sponsoring program.
- Selection of fellows must follow documented departmental processes to allow for
 - Equal opportunity selection processes must be employed for post-graduate fellows and appropriate regulations and institutional policies and procedures must be followed.
 - In case of competition for training slots for enrolled fellows, selection must be based upon a pre-defined system, such as merit or lottery
 - Opportunities to enhance diversity, equity, and inclusion should be pursued.
 - A high rate of fellowship attrition from a program may adversely affect the fellowship accreditation status.

FACULTY QUALIFICATIONS AND RESPONSIBILITIES

- Fellowship Program Director (FPD) Qualifications
 - There must be a single program director responsible for the fellowship . This individual should be part of the core faculty and must be board certified by their primary ABMS board and be a neurocritical care specialist with a subspecialty credential/certification in neurocritical care. Examples of subspecialty credential/certification accepted are:
 - Recognition of Focused Practice Designation credential from the ABNS
 - Neurocritical Care certification from the APBN
 - Neurocritical Care certification from the UCNS
 - CAST certificate from the SNS/CAST
 - This certification will no longer be accepted as a subspecialty credential for any CAST neurocritical care fellowship as of July 1, 2027
- Fellowship Program Director (FPD) Responsibilities
 - The FPD must assume responsibility for the training program and devote sufficient time to the educational program including the following:
 - Preparation of a written curriculum outlining the educational goals of the program with respect to knowledge, skills, and other attributes to be attained during the fellowship. This statement must be distributed to the fellow and members of the teaching staff and be available for review
 - Selection of fellows in accordance with institutional and departmental/division policies.
 - Selection and supervision of the teaching staff and other program personnel at the institution(s) participating in the program
 - The FPD should be appointed by the Chair of the sponsoring neurosurgical department and will be accountable to that Chair and the residency Program Director of the neurosurgical residency program to coordinate training and other departmental goals, even if they also directly report to a Chair of another department (such as Neurology)

- The supervision of the fellow through explicit written directives relative to responsibilities in-patient care as well as supervisory lines. These guidelines must be communicated to all members of the program faculty. Fellows must be provided with prompt, reliable systems for communication and interaction with supervisory physicians.
- The FPD is responsible for selecting fellows in accordance with institutional and departmental policies and procedures. The FPD is responsible for selecting fellows in accordance with institutional and departmental policies and procedures, and establishing an evaluation system of the fellow's knowledge, skills, and overall performance, including the development of professional attitudes.
- Ensure the implementation of fair policies, grievance procedures, and due process, as established by the sponsoring institutional requirements and in compliance with the principles of the ACGME.
- The fellowship director, with participation of members of the teaching staff, shall:
 - Evaluate the knowledge, skills, and professional growth of the fellow using appropriate criteria and procedures while being responsible the establishment and maintenance of a stable educational environment.
 - Communicate each evaluation to the fellow in a timely manner.
 - Ensure that durations of appointment for core faculty are also essential in maintaining continuity of the educational environment
 - Advance fellows to positions of increasing responsibility based on satisfactory progression in patient management, scholarship, and professional growth.
 - Maintain a permanent record of evaluations of each fellow and have it accessible to the fellow and other authorized personnel.
 - Provide a written final evaluation for the fellow on completion of the program. This evaluation must include a review of the fellow's performance during the final period of training and verification of the fellow's demonstrated professional abilities and competence for independent practice. This final evaluation should be part of the fellow's permanent record maintained by the institution.
 - Implement all procedures, as established by the sponsoring institution, regarding academic discipline and complaints or grievances pertinent to the fellowship trainees.
 - Monitor fellow's stress, including mental or emotional conditions affecting performance or learning and drug or alcohol-related dysfunction. Fellowship directors and teaching staff should be sensitive to the need for timely provision of confidential counseling and psychological support services to the fellow. Training situations that consistently produce undesirable stress on the fellow must be evaluated and modified.
 - Prepare accurate statistical and narrative descriptions of the program as required
 - Notify CAST regarding major programmatic changes.
- Other Teaching Faculty Qualifications and Number
 - All clinical fellowship faculty members shall be certified by, or be in the certification process of their primary ABMS board and have a current, valid, unrestricted licenses to practice medicine in the state of the program and be appropriately qualified in their fields and possess appropriate institutional appointments
 - The Chair of Neurological Surgery should also appoint fellowship core faculty.

- If the FPD is not a neurosurgeon, there must be a neurosurgeon as part of the core faculty that has a subspecialty credential in neurocritical care, or at a minimum has passed the RFPD (Recognition of Focused Practice Designation) exam.
 - A neurosurgeon with a CAST certificate must have a different subspecialty credential or have passed the FRPD exam by July 1, 2027
- The primary teaching staff should be based at the sponsoring institution or its additional institutions at which the fellow will rotate.
- All members of the teaching staff must demonstrate a strong interest in the education of fellows, sound clinical and teaching abilities, support of the goals and objectives of the fellowship, a commitment to their own continuing medical education, and participation in scholarly activities.
- Both core and non-core teaching faculty may include specialists from neurological surgery, neurology, critical care, surgery, medicine, pediatrics, anesthesiology, emergency medicine, and other specialties who may be involved in the care of specific patients. Therefore, a collegial relationship must be maintained among the critical care services, including the ICU and training program directors and the faculty to enhance optimal patient care and assure educational opportunities for all residents and fellows.
- If multiple institutions are approved for participation in the fellowship program, a member of the teaching staff (site director) at each participating institution must be specifically designated to assume responsibility for the day-to-day activities of the fellowship at that institution with overall coordination by the fellowship director.
- The faculty must have regular documented meetings to review the fellowship training, the financial and administrative support of the fellowship, the volume and variety of patients available for educational purposes, the performance of members of the teaching staff, and the quality of fellowship supervision.
- Non-physician faculty and other clinical personnel
 - Additional necessary professional, technical, and clerical personnel must be provided to support the program that is primarily educational in nature.
 - Specially trained nurses and technicians who are skilled in radiological equipment, critical care instrumentation, respiratory function, and laboratory medicine.
 - Interdisciplinary professionals who support the neurocritical care unit, such as pharmacy and pathology.
 - Advanced practice providers (APPs) such as nurse practitioners and physician assistants should collaborate cooperatively with the team members to enhance their educational experience and contribute to a collegial and educational environment.
 - Fellowship Program Coordinator/Administrator
 - A Fellowship Program Coordinator (FPC)/Administrator must be identified to support the administration and educational conduct of the fellowship. The FPC assists the program director in keeping fellow and institutional case logs, educational programming, evaluation documentation, and supports the program and fellow's(s) day-to-day activities. The FPC is a key member of the leadership team and is critical to the success and accreditation of the program.

- It is understood that an FPC/Administrator may support more than one CAST-accredited fellowship program. However, to have sufficient time dedicated to the administrative activities necessary to support the program and its participating fellows effectively, it is recommended FPC support should be aligned with effort detailed in the table below.

Number of approved fellow positions across all CAST fellowships within	Minimum FTE Recommendation
1 – 3 fellows	30%
4 – 7 fellows	40%
8 or more fellows	50%

LOGISTICS OF TRAINING

- Program goals and design
 - The Educational Program
 - All educational components of the fellowship should be related to the specified goals and must not interfere with the training opportunities of residents who are members of the sponsoring neurosurgical residency program.
 - Existence of required program design and sequencing of educational experiences and training environment are requisite for SNS CAST accreditation.
 - The program must possess a written statement that outlines its educational goals and objectives relative to knowledge, skills, and other competencies. This statement must be distributed to residents, fellows, and faculty, and must be reviewed with the trainees prior to their assignments.
 - The training program must enable the trainee to acquire an advanced body of knowledge and level of skill in the management of critically ill neurologic and neurosurgical patients with competency to assume primary responsibility for care of these patients in the ICU setting. This advanced body of knowledge and level of skill must include the mastery of:
 - Teach the subspecialty of neurological/neurosurgical critical care
 - Undertake investigations into the various areas of neurologic and neurosurgical critical care, such as new instrumentation, identification of important physiologic parameters, evaluation of pharmacologic agents in critically ill patients, health outcomes and/or health policy issues related to neurosurgical critical care.
 - Function as a Medical Director of a neurocritical care unit.
 - The use of advanced technology and instrumentation to monitor the physiologic status of children or adults, including those in neonatal, pediatric, child-bearing, or advanced years

- Organizational and administrative aspects of a neurosurgical critical care unit
 - Ethical, economic, and legal issues as they pertain to critical care.
- Other Components
- The fellow must actively participate in scholarly activities and should contribute to the education of neurosurgery residents and medical students.
 - The fellowship program should provide opportunities for the fellow to engage in research related to the subspecialty.
 - Each fellow must have at least one academic contribution as first author in one of the following:
 - peer-reviewed paper
 - book chapter
 - presentation at a major meeting which will need to be detailed in the annual report
 - The fellowship program should have regular dedicated teaching conferences with participation of the fellow, the associated faculty, and residents of the sponsoring program. Participation of other affiliated disciplines should be encouraged.
- Competencies
- A fellowship program must require that its fellows obtain competence in the ACGME Competencies to the level expected of a new practitioner in the subspecialty. Programs must define the specific and unique learning objectives in the area including the knowledge, skills, behaviors, and attitudes required and provide educational experiences as needed for their fellows to demonstrate the following:
 - Patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health
 - Medical knowledge about established and evolving biomedical, clinical, and basic sciences, as well as the application of this knowledge to patient care
 - Practice-based learning and improvement that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care
 - Interpersonal and communication skills that result in effective information exchange and collaboration with patients, their families, and other health professionals
 - Professionalism, as manifested through a commitment to fulfilling professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population
 - Systems-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value Neurocritical Care Curricula. The program must

possess a well-organized and effective curriculum, both didactic and clinical and provide residents/fellows with direct experience in progressive responsibility for patient management. Programs will be expected to provide experiences that will allow achievement of the SNS-CAST published Neurocritical Care Curriculum.

- Cardiorespiratory resuscitation
 - Physiology, pathophysiology, diagnosis, and therapy of disorders of cardiovascular, respiratory, gastrointestinal, neurological, endocrine, musculoskeletal, as well as of infectious diseases
 - Metabolic, nutritional, and endocrine effects of critical illness
 - Hematologic and coagulation disorders
 - Polytrauma and the interface with neurotrauma
 - Monitoring and medical instrumentation
 - Critical pediatric neurologic/neurosurgical conditions
 - Pharmacokinetics and dynamics of drug metabolism and excretion in critical illness
 - Ethical and legal aspects of neurologic/neurosurgical critical care
- The program must provide supervised clinical training that will enable the resident to gain competence in the performance and application of the following exemplar critical care skills:
 - Respiratory
 - Airway management, ventilator management, adjunctive respiratory therapy techniques, management of respiratory failure
 - Circulatory
 - Invasive and noninvasive monitoring techniques, including computations of cardiac output and of systemic and pulmonary vascular resistance; monitoring, electrocardiograms; management of shock; indication for echocardiograms, advanced cardiac support, and extracorporeal membrane oxygenation.
 - Neurological
 - The performance of complete neurological examinations and application of commonly employed prognostic signs and scales; the use of multimodality intracranial monitoring techniques and of the electroencephalogram to evaluate cerebral function; application of hypothermia
 - Renal
 - The evaluation and treatment of renal dysfunction, indication for renal replacement therapy
 - Gastrointestinal
 - Utilization of gastrointestinal intubation in the management of the critically ill patient; application of enteral feedings; management of percutaneous catheter devices; management of acute hepatic abnormalities.

- Hematologic
 - Techniques of evaluation of coagulation status; appropriate use of component therapy Infectious disease: classification of infections and application of isolation techniques, pharmacokinetics, drug interactions and management of antibiotic therapy, recognition and treatment of sepsis
- Nutritional
 - Application of parenteral and enteral nutrition; monitoring and assessment of metabolism and nutrition
- Miscellaneous
 - Use of special beds and equipment; employment of pneumatic antishock garments, traction, and fixation devices
 - Procedures: performance of bedside procedures integral to the provision of critical care (e.g., central lines, intubations, bronchoscopy, thoracostomy, thoracentesis/paracentesis, etc.)

FELLOWSHIP POLICIES

- Supervision
 - All patient care services must be supervised by appropriately qualified faculty in accordance with institutional guidelines.
 - The fellowship director must insure, direct, and document proper supervision of the fellow at all times by attending physicians with appropriate experience for the severity and complexity of the patient's condition.
 - The fellowship trainee must be provided with rapid, reliable systems for communication with supervisors and have an understanding of appropriate escalation and chain of command policies and procedures.
 - Faculty schedules must be structured to provide residents with appropriate levels of continuous supervision and consultation.
 - Faculty and fellows must be educated to recognize the signs of fatigue, and the program should adopt and apply policies to prevent and counteract its potential negative effects.
 - A supervision policy must be documented in every application, and the policy must be shared with the trainees before the onset of their assigned rotations in the program.
- Maintenance of Case Logs
 - The fellowship program director must maintain accurate case numbers reflecting procedures and diagnoses potentially available to the fellow within the institution as detailed in the procedural/case minimum requirements on page 15.
 - The fellow must maintain an accurate prospective log of his/her bedside procedures, as well as participation in case of diagnosis categories detailed on page 15.

- Evaluations

- As noted previously, there shall be written evaluations and constructive discussions of the fellow by the faculty relative to performance and accomplishments of stated goals. These

evaluations must occur at a minimum of two times per year and be maintained in a permanent file.

- Formative evaluations must include

- Use of methods that produce an accurate assessment of trainees' competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.
- Assessment should include the use of assessment results, including evaluation by faculty, patients, peers, self, and other professional staff, to achieve progressive improvements in fellows' competence and performance.

- Final evaluation must include:

- A final evaluation by the Fellowship Program Director for each fellow who completes the program that includes the following:
 - Review of the trainee's performance during the final period of education
 - Verifying the resident has demonstrated sufficient professional ability to practice competently and independently.
- The final evaluation must be part of the fellow's permanent record maintained by the institution.
- Faculty performance must be evaluated by the program regularly.
 - This should no less frequent than at the midpoint of the accreditation cycle.
 - Evaluations should include a review of faculty teaching abilities, commitment to the educational program, clinical knowledge, and scholarly activities.
 - This evaluation must include annual written confidential evaluations by residents rotating on neurocritical care services as well.
- Program evaluations should include:
 - The educational effectiveness of a program and rotations should be evaluated in a systematic manner designed to maintain the fellows' confidentiality.
- Fellowship Program Director evaluation should include:
 - Performance and effectiveness of the FPD should be evaluated no less frequently than semi-annually by fellows and faculty in a systematic manner to maintain the fellows' and faculty members' confidentiality
- Documentation of Evaluation Process need to be described in applications and reapplications for accreditation in sufficient detail to ensure SNS-CAST that the above goals are met.

- Duty Hours and Conditions of Work
 - Duty hours are defined as all clinical and academic activities related to the training 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.
 - Providing trainees with a sound didactic and clinical education must be carefully planned and balanced with concerns for patient safety and resident well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on trainees to fulfill service obligations. Didactic and clinical education must have priority in the allotment of residents' time and energy
 - Duty hours and work conditions for subspecialty fellows must be consistent with ACGME, institutional, and program requirements for residency training in neurological surgery for those individuals who are in the last year of residency. Post residency fellow duty hours and work conditions must be consistent with the regulations of the sponsoring institution.
 - Each program must have written policies that are distributed to the trainers and faculty with procedures consistent with the institutional and program requirements for resident duty hours and the working environment and must recognize that faculty and learners collectively have responsibility for the safety and welfare of patients.
 - Duty hours must be monitored with a frequency sufficient to ensure an appropriate balance between education and service and such that infractions can be identified and rectified if repeated.
 - Duty hours do not include reading and preparation time spent away from the duty site.
 - Back-up support systems must be provided when patient care responsibilities are unusually difficult or prolonged, or if unexpected circumstances create resident fatigue sufficient to jeopardize patient care.

- On-Call Activities
 - The objective of on-call activities is to provide trainees with continuity of patient care throughout a 24-hour period. "In-house call" is defined as those duty hours beyond the normal workday when residents are required to be immediately available inside the assigned institution.

- Program Changes
 - In the event of a change in the Fellowship Program Director, an FPD change application must immediately be submitted by the program.
 - Any accreditation changes from the sponsoring residency program must be reported
 - Other changes may be submitted/requested in the yearly annual report application that must be submitted by each accredited fellowship. Those changes include:
 - Requesting an increase to the approved fellow complement
 - Requesting an additional site for the fellowship
 - Submitted changes to the fellowship's core faculty

PROCEDURAL/CASE MINIMUM REQUIREMENTS

- **Minimum procedural case log requirements for institution and fellow**
 - Please note that for NCC CAST fellowships, institutional cases should include site cases that the CAST fellow *would have access to* if there was a fellow, versus case numbers for all areas of the site(s)
 - Demonstrate competency with all of the procedures listed below having completed at least the minimum number identified below during the fellowship:
 - Ventriculostomy Placement and Management (**minimum 10**)
 - ICP Monitor Placement and Management (**minimum 10**)
 - Lumbar Puncture/ Lumbar Drain (**minimum 10**)
 - Arterial Line Placement (**minimum 10**)
 - Central Line Placement (**minimum 10**)
 - Conscious sedation (**minimum 5**)
 - Point of Care Ultrasound (**minimum 20**)
 - Endotracheal Intubation (**minimum 15**)
 - Bronchoscopy (**minimum 20**)
 - Ventilator Management (**minimum 50**)
 - Leading Emergency Response (**minimum 10**)
 - Conducting family meeting/palliative care/hospice planning (**minimum 10**)
 - Total Critical Care Patients Managed (**minimum 100**)
 - TBI (**minimum 10**)
 - SAH (**minimum 10**)
 - Ischemic stroke (**minimum 10**)
 - Hemorrhagic stroke (**minimum 10**)
 - Spinal Cord Injury (**minimum 5**)
 - CNS Infection (**minimum 5**)
 - Acute neuromuscular process (**minimum 5**)
 - Status epilepticus (**minimum 5**)
 - Altered Mental Status (metabolic coma, PRES, cerebral edema) (**minimum 10**)
 - Acute or Chronic Medical Conditions (AKI, MI, CHF, dysrhythmia, pneumonia) (**minimum 10**)

MAINTENANCE OF FELLOWSHIP ACCREDITATION

- Each year, the FPD for every accredited CAST fellowship program is required to submit an annual report. CAST will offer continued accreditation based upon review and approval of the annual report. For each annual report, the following must be included:

- Demographic/contact information for fellowship sites and leadership
 - Full faculty list
 - Detailed block diagram and fellow schedule
 - Institutional case numbers for academic year in review
 - Fellow case numbers for academic year (when applicable)
 - Attestation letter from the fellowship program director
 - Support letter from Chair of department
- Factors that may impact accreditation renewal include:
 - Adverse actions of the Neurological Surgery Review Committee (RC) relative to the parent residency training program
 - Changes in fellowship leadership
 - Failure to maintain a satisfactory volume of cases
 - Major changes in the fellowship faculty
 - Failure to provide adequate administrative support
 - Failure to complete required annual reports completely and accurately.

