Fellowships

PROGRAM REQUIREMENTS FOR ADVANCED TRAINING IN NEUROCRITICAL CARE: NEUROLOGICAL SURGERY

Definition and Scope of Education

Definition

Neurocritical care deals with complex neurosurgical, neurological and medical problems in critically ill, surgical and non-surgical patients. Although neurosurgical residency provides extensive exposure to neurocritical care, opportunities and expertise vary among training programs and individual residents. The object of providing these program requirements is to specify a curriculum of knowledge and clinical skills as well as training environment and administrative resources for neurosurgical residents and fellows to develop advanced proficiency in the management of critically ill neurologic and neurosurgical patients; to develop the qualifications that facilitate supervision of surgical critical care units, and to educate trainees in state of the art neurosurgical critical care in the ICU setting.

Duration and Scope of Training

The educational program may be enfolded and completed within the neurosurgical residency. Fellowship in neurosurgical critical care may also be accomplished after completion of formal residency training. The duration of dedicated time to neuro critical care should total no less than 12 months. This may occur in 4-month blocks and must involve advanced educational and clinical activities related to the care of critically ill neurosurgical and neurological patients. As part of advanced neurosurgical critical care training, neurosurgical residents and fellows may appropriately engage in operative care of neurologic critically ill patients.

INSTITUTIONS

Sponsoring Programs

The program for advanced training in neurosurgical critical care must exist within the structure of an ACGME accredited (or its equivalent) neurosurgical residency training program.

Multiple Programs

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.

Setting

The neurosurgical critical care training program must include educational activities in a surgical critical care unit or neurological critical care unit and exposure to both pediatric and adult patients. This education may take place in various settings that provide for the care of critically ill adult and pediatric surgical patients, including those with traumatic injuries, cerebrovascular insults, neuro-oncologic disorders, status epilepticus, and spine and spinal cord disorders including traumatic injuries.

Intensive Care Unit Beds

The institution must have a Neurologic/Neurosurgical Intensive Care Unit or dedicated beds in a general ICU devoted to neurological and neurosurgical conditions and patients.

PROGRAM PERSONNEL AND RESOURCES

Program Director

- There must be a single program director responsible for the program. This individual must be a CAST certified NeuroCritical Care specialist a with subspecialty expertise in surgical and/or neurosurgical critical care. The program director is accountable for the operation of the training program. It is desirable that the neurosurgical critical care program director be appointed by and responsible to the chair of the sponsoring neurosurgical department and residency program.
- The program director, together with the faculty, is responsible for the general administration of the program, and for the establishment and maintenance of a stable educational environment. Adequate lengths of appointment for both the program director and faculty are essential in maintaining continuity of leadership and the educational environment.
- The program director is responsible for preparing an accurate statistical and narrative description of the program.
- The program director must ensure the implementation of fair policies, grievance procedures, and due process, as established by the sponsoring institution and in compliance with the Institutional Requirements.
- It is recognized that within the environment of the neurosurgical critical care unit, the teaching staff in neurological surgery, neurology, critical care, surgery, medicine, pediatrics, anesthesiology, and other specialties may be involved in the care of specific patients. Therefore, a collegial relationship must be maintained among the critical care services, the directors and the faculty of critical care educational programs to enhance optimal patient care and assure educational opportunities for all residents.
- In the event of a change in the neurosurgical critical care program director or a substantial change in the program's faculty or the status of the sponsoring neurosurgical residency training program, the program director or neurosurgical department chair shall notify the SNS Committee on Accreditation of Subspecialty Training.

Faculty

- At each participating institution, there must be a sufficient number of faculty with documented qualifications to supervise patient care and instruct all residents in the training program.
- The faculty must devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities. They must demonstrate a strong interest in the education of residents, and must support the goals and objectives of the educational program.

Qualifications of physician faculty are as follows:

    - The physician faculty must possess the requisite specialty knowledge, expertise, experience and competence in neurosurgical critical care, both operative and non-operative, and as well possess educational and administrative abilities in their field. The faculty must be board certified (or the equivalent) in their individual specialties. At least one neurosurgeon qualified in neurosurgical critical care must be part of the teaching staff. The physician faculty must be appointed and in good standing on the staff of the participating institution

- The responsibility for establishing and maintaining an environment of inquiry and scholarship rests with the faculty; active and/or basic science research activities should be existent in each program.

Scholarship is defined as the following:

    - the scholarship of *discovery*, as evidenced by peer reviewed funding or by publications of original research in peer reviewed journals; the scholarship of *dissemination*, as evidenced by review articles or chapters in textbooks; the

scholarship of *application*, as evidenced by the publication or presentation of specialty specific educational information at local, regional, or national professional and scientific society meetings.

- Complementary to the above scholarship is the regular participation of the teaching staff in clinical discussions, rounds, journal clubs, and research conferences in a manner that promotes a spirit of inquiry and scholarship (e.g., the offering of guidance and technical support for residents involved in research, such as research design and statistical analysis); and the provision of support for residents' participation, as appropriate, in scholarly activities.

Qualifications of the non-physician faculty are as follows:

- Non-physician faculty must be appropriately qualified in their fields.
- Non-physician faculty must possess appropriate institutional appointments.
- Other Program Personnel: Additional necessary professional, technical, and clerical personnel must be provided to support the program. These staff members may include specially trained nurses and technicians who are skilled in critical care instrumentation, respiratory function, and laboratory medicine.

Facilities and Resources

There must be appropriate resources (laboratory space and equipment, computer facilities) and designated space for patient care conferences, nursing and support personnel, as well as family waiting and consultation areas. The critical care units must exist as distinct entities, in designated areas within the institution, constructed an designed specifically for the care of critically ill patients.

RESIDENT APPOINTMENTS

Appointment of Fellows and Other Trainees

The appointment of fellows and other specialty residents or trainees must not dilute or detract from the educational opportunities available to regularly appointed residents.

PROGRAM CURRICULUM

Program Design

- 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 and faculty, and must be reviewed with the trainees prior to their assignments.

- The training program in advanced neurosurgical critical care 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 responsibility for care of these patients in the ICU setting. This advanced body of knowledge and level of skill must include the mastery of: (1) 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; (2) organizational and administrative aspects of a neurosurgical critical care unit; and (3) ethical, economic and legal issues as they pertain to critical care.

- Trainees (residents and fellows) completing neurosurgical critical care training will be expected to:

- teach the subspecialty of 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.

SPECIALTY CURRICULUM

The program must possess a well-organized and effective curriculum, both didactic and

clinical. The curriculum must also provide residents/fellows with direct experience in progressive responsibility for patient management.

Didactic Curriculum

The program must provide the opportunity for residents to acquire advanced knowledge of the following aspects of neurosurgical critical care, particularly as they relate to the management of patients with hemodynamic instability, multiple system organ failure, and complex coexisting medical problems:

- Cardiorespiratory resuscitation
- Physiology, pathophysiology, diagnosis, and therapy of disorders of the cardiovascular, respiratory, gastrointestinal, neurological, endocrine, musculoskeletal, as well as of infectious diseases
- Metabolic, nutritional, and endocrine effects of critical illness
- Hematologic and coagulation disorders
- Trauma as it relates to neurological disease
- Monitoring and medical instrumentation
- Critical pediatric neurosurgical conditions
- Pharmacokinetics and dynamics of drug metabolism and excretion in critical illness
- Ethical and legal aspects of neurosurgical critical care

Clinical Components

The program must provide supervised training that will enable the resident to gain competence in the performance and application of the following neurosurgical critical care skills:

- Respiratory: airway management.
- Circulatory: invasive and noninvasive monitoring techniques, including computations of cardiac output and of systemic and pulmonary vascular resistance; monitoring, electrocardiograms, electroencephalograms.
- Neurological: the performance of complete neurological examinations; the use of intracranial pressure monitoring techniques and of the electroencephalogram to evaluate cerebral function; application of hypothermia in the management of cerebral trauma.
- Renal: the evaluation of renal function; as it relates to the neurosurgical patient and treatment paradigm.
- Gastrointestinal: utilization of gastrointestinal intubation in the management of the critically ill patient; application of enteral feedings; management of percutaneous catheter devices.
- Hematologic: 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 during treatment of the neurological patient.
- Nutritional: application of parenteral and enteral nutrition; monitoring and assessing metabolism and nutrition.
- Miscellaneous: use of special beds for specific injuries; employment of pneumatic antishock garments, traction, and fixation devices

Documentation of Clinical Experiences

- The program must document that trainees in the surgical critical care program have had direct

involvement in the management of a broad spectrum of critically ill neurologic/neurosurgical patients.

- The average daily census for each neurosurgical critical care unit to which Residents/fellows are assigned must permit a reasonable resident/fellow-to-patient ratio.

Residents/Fellows Scholarly Activities

Each program must provide an opportunity for trainees to participate in research or other scholarly activities, and trainees must participate actively in such scholarly activities.

Resident Duty Hours and the Working Environment

Providing residents/fellows 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 hour assignments must recognize that faculty and residents/fellows collectively have responsibility for the safety and welfare of patients.

Supervision of Residents/Fellows

- All patient care must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of residents at all times. Trainees must be provided with rapid, reliable systems for communicating with supervising faculty.

- Faculty schedules must be structured to provide residents with continuous supervision and consultation.

- Faculty and residents/fellows must be educated to recognize the signs of fatigue, and adopt and apply policies to prevent and counteract its potential negative effects.

Duty Hours

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

- Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities as defined by the RRC.

On-Call Activities

- The objective of on-call activities is to provide residents/FELLOWS with continuity of patient care experiences throughout a 24-hour period. *In-house call* is defined as those duty hours beyond the normal work day, when residents are required to be immediately available in the assigned institution.

Oversight

- Each program must have written policies and procedures consistent with the Institutional and Program Requirements for resident duty hours and the working environment. These policies must be distributed to the trainees and the faculty. Duty hours must be monitored with a frequency sufficient to ensure an appropriate balance between education and service.

- 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.

EVALUATION

Resident

Formative Evaluation

The faculty must evaluate in a timely manner the residents/fellows whom they supervise. In addition, the training program must demonstrate that it has an effective mechanism for assessing trainee performance throughout the program, and for utilizing the results to improve performance.

- Assessment should include the use of methods that produce an accurate assessment of residents' competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice.
- Assessment should include the regular and timely performance feedback to residents that includes at least semiannual written evaluations. Such evaluations are to be communicated to trainees in a timely manner, and maintained in a record that is accessible to each resident/fellow.
- Assessment should include the use of assessment results, including evaluation by faculty, patients, peers, self, and other professional staff, to achieve progressive improvements in residents' competence and performance.

Final Evaluation

The program director must provide a final evaluation for each Resident/FELLOW who completes the program. This evaluation must include a review of the trainee's performance during the final period of education, and should verify that the resident has demonstrated sufficient professional ability to practice competently and independently. The final evaluation must be part of the resident/fellow's permanent record maintained by the institution.

Faculty

The performance of the faculty must be evaluated by the program no less frequently than at the midpoint of the accreditation cycle, and again prior to the next site visit. The evaluations should include a review of their teaching abilities, commitment to the educational program, clinical knowledge, and scholarly activities. This evaluation must include annual written confidential evaluations by residents.

Program

The educational effectiveness of a program should be evaluated in a systematic manner.