Application for Focused Practice in Neurological Critical Care by the ABNS

Focused Practice Criteria

1. The focused practice of neurological critical care will be sponsored by the ABNS, who will define the eligibility criteria and submit the application to COCERT.

2. Eligible diplomates will be certified by the ABNS and have an active primary certificate with good standing in the community.

3. The ABNS has developed the clinical practice experience (both in terms of time and volume) beyond initial training required for eligibility. Formal fellowship training may count toward the practice requirement.

4. The ABNS has developed the requirements, including a Board-based assessment for eligible diplomates, including an initial cognitive exam, and an annual MOC tool.

5. The neurological critical care focused practice has an MOC requirement that interfaces seamlessly with the primary certification MOC program.
Application for Focused Practice in Neurological Critical Care by the American Board of Neurological Surgery

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Name of Sponsoring Board(s): American Board of Neurological Surgery (ABNS)

1. Provide the name of the proposed area of focused practice:

   Neurological Critical Care (NeuCC)

2. If multiple Boards are interested in this Focused Practice Designation and wish to collaboratively submit an application, please view the addendum found at the end this application. Each Board should complete an addendum to describe specialty-specific modifications.

   Currently, American Board of Psychiatry and Neurology (ABPN), American Board of Anesthesiology (ABA) and the American Board of Emergency Medicine (ABEM) are interested in potentially playing a future role in this collaboration. However, for the time being, while they support the Request for Focused Practice (RFP) for neurosurgeons they would like to wait on actually allowing their diplomats to participate. The likely reason for this is that the four boards (ABNS, ABPN, ABEM and ABA) are currently also collaborating on a separate subspecialty application. The current need for the RFP is for the most part in neurosurgery and to a much lesser degree in the other specialties.

3. State the purpose of the proposed area of focused practice and include the rationale for how this area of focused practice is different than a subspecialty, in two paragraphs or less:

   Neurological Critical Care (NeuCC) is devoted to the comprehensive multisystem care of the critically ill patient with neurological diseases/conditions. Like other intensivists, the neurological intensivist usually assumes the primary care role for his or her patients in the intensive care unit. In order to do so, a neurological intensivist must acquire the knowledge and skills to manage both the neurological and critical care aspects of care. They, in turn, harmonize the care of patients by taking responsibility for various integrated elements of ICU care that might otherwise be provided by multiple subspecialists. The ultimate goal of neurological critical care is to provide optimal care to a unique patient population that simultaneously requires synergistic expert management of acute nervous system and critical care aspects of care. The published literature indicates that patients are best served when cared for by physicians with specific training that addresses both these areas. It is not the intent of this focused practice to prevent physicians from other specialties, including neurosurgery, anesthesia, and emergency medicine, or subspecialties (e.g. neurocritical care [under review for approval and supported by those three specialties]) from caring for patients in intensive care units who have neurologic conditions even if those units are staffed by neurological intensivists. In fact it is critical and expected that practitioners participating in this program of focused practice fully engage the specialists or subspecialists caring for the patients in intensive care units who have neurological conditions and collaborate with them in the best interests of the patients. This is particularly true of patients with neurological diseases who have undergone surgical procedures or who may need surgical procedures.

   It is the intention of this focused practice pathway to recognize that there exists, and will likely always
exist, a cadre of practitioners who are going to be needed by society to provide high quality neurological critical care while still actively engaged in the clinical practice of their primary specialty whether that be neurosurgery, vascular or general neurology or emergency medicine. These practitioners will focus their practice in neurological intensive care but continue to be substantially and meaningfully involved in a related but distinct clinical practice. In many instances these practitioners are likely to spend as much or more time practicing their primary specialty. For these practitioners it is imperative that they have access to meaningful and robust focused educational opportunities and assessments. While the subspecialty of NeuroCritical Care will allow for such training in the ‘grandfathering’ period, the NeuCC Focused Practice designation is being brought forth to recognize those individuals who gain clinical expertise in this area after the ‘grandfathering’ period has expired.

4. Focused practice typically falls under one of these areas. Please describe which of the following this application addresses:
   a. Evolving area of practice
   b. Area of practice limited in scope or size
   c. Specialized procedure

   Evolving area of practice, limited in scope and size, with use of specialized procedures, are all apt descriptors when applied to the focused practice of Neurological Intensive Care (NeuCC) as distinct from the subspecialty of NeuroCritical Care (NCC). Specialized neuro-trauma units run by operating neurosurgeons which treat large numbers of patients with non-traumatic diseases such as Guillaine-Barre, refractory status epilepticus, and complicated stroke is one area of evolving practice. Another is the development of neurological emergency rooms and a third is the specialized stroke unit. All of these end up treating large numbers of patients with various neurological intensive care issues and are for the most part staffed by physicians not exclusively practicing the subspecialty of neurological critical care. In addition there is the general neurological intensive care units in smaller hospitals staffed by physicians from multiple backgrounds playing multiple roles. While each of these practice settings is limited in scope and size they enrich the development of the entire field by enabling physicians with unique skill sets to bring specialized procedures forward that otherwise would not be possible. One example is the roll neurosurgical intensivists have played in bringing forward decompressive craniectomy, invasive multi-modality neuro-monitoring and deep brain stimulation for acute coma.

5. Please outline the eligibility criteria required of candidates in the proposed area of focused practice, as it pertains to the following:
   a. What specialty and/or subspecialty certificate(s) will a diplomate be required to hold in order to be eligible for this area of focused practice?

      Initially ABNS board certification, but ultimately it is envisioned that those with ABPN, ABA and ABEM certification may be eligible if these boards eventually become fully engaged rather than merely supportive.

   b. Clinical practice experience (both in terms of time and patient volume) in the area of focused practice, beyond initial training:

      Those intending to be recognized in the NeuCC RFP will have documented (similar to the NCC Subspecialty) at least one of the following: (1) An average of at least 17% of their post-training clinical practice time spent in the practice of NCC (at least 300 hours per year) for the past 6 years," or, (2) An average of at least 25% of their post-training clinical practice time spent in the practice of NCC (at least
450 hours per year) for the past 4 years,* or, (3) An average of at least 33% of their post-training clinical practice time spent in the practice of NCC (at least 600 hours per year) for the past 3 years,* or, (4) An average of at least 50% of their post-training clinical practice time spent in the practice of NCC (at least 900 hours per year) for the past 2 years or, (5) An average of at least 25% of their total post-training professional time spent in the practice of NCC (at least 450 hours per year) for the past 4 years in the case of academics and those with extensive research or administrative responsibility. The Member Boards participating in the RFP of NeuCC will seek independent verification of NeuCC practice and competence of those candidates applying for the NeuCC RFP. Member Boards will accept this verification from one of the following individuals: the program director of the Neuro- or Neurological Critical Care fellowship program affiliated with the hospital where the physician spends the majority of his or her NCC clinical time, medical director of the Neuro- or Neurological Critical Care Intensive Care Unit, the Chief of Neuro- or Neurological Care in that hospital, the physician’s department chair, the hospital Chief of Staff or Chief Medical Officer, or the Vice-President of Medical Affairs.

c. Additional qualifications (if any):

Those certified in NCC by UCNS or CAST (prior to 2023) or those who have completed a “fellowship” in NCC (ACGME-, UCNS-, CAST- accredited, or other equivalent non-accredited fellowship as judged by the RFP fellowship training committee) will also be eligible for the RFP one they have also passed the initial NCC RFP closed book, secure, cognitive exam.

6. With regard to Board-based assessment for candidates prior to awarding this area of focused practice, which assessment methods will be required? (Check all that apply)

- Examination
- Written
- Oral/practical
- Other (Please specify)
- Participation in a registry
- Submission and review of case lists
- Review of patient charts
- Other (please specify)

a. Please describe the rationale behind the method(s) required in the assessment process:

7. Please outline the Maintenance of Certification (MOC) program planned for this area of focused practice:

The MOC program will consist of the following: 1) The diplomat must be currently board certified by an ABMS member board sponsoring the Neurological Critical Care RFP and in good standing with one’s primary board continuous certification (CC/MOC) program; 2) Participate in the Neurological Critical Care RFP Annual Web-based learning tool offered through ABNS and Scitent, Inc. and accessed through primary board web-site; 3) Confirm ongoing focus of practice as evidence by at least 17% of clinical or professional time (300 hours per year) with care delivered in an intensive care unit.
8. Document the professional and scientific status of this area of focused practice by addressing (a) through (d) below.

a. Please describe how the existence of a body of scientific medical knowledge underlying the proposed area of focused practice is, in large part, distinct from, or more detailed than that of other areas in which certification or focused practice are offered:

Specialty training in the neurosciences addresses a broad and rapidly expanding body of knowledge. With the growth of diagnostic and therapeutic options in the clinical neurosciences it is clear that additional subspecialty training is required to master them. The explosive growth and maturation of the field of Neurological Critical Care (NeuCC), the unique population served, and the specialized skill set required to serve that population in multiple diverse clinical settings have set the framework for this application to offer not only subspecialty certification in Neurocritical Care (NCC) but also a RFP in Neurological Critical Care (NeuCC). The advent of mechanical ventilation and expanded interest in management of brain-injured patients historically bonded critical care and clinical neurosciences providers. As understanding of secondary neurological injury and advanced therapies developed, it was apparent that clinicians who have an understanding of the underlying neurological disease processes (e.g. stroke, Guillain-Barre syndrome, myasthenia gravis, traumatic brain injury and status epilepticus) and specialized expertise in critical care are best equipped to provide comprehensive integrated multisystem care to critically ill patients with nervous system disorders. Expertise needed includes the procedural and cognitive skills needed for standard forms of ICU monitoring and management as well as specialized forms of neurological monitoring and interventions. The body of scientific medical knowledge that defines the field continues to rapidly develop. Journals such as Neurology, Critical Care Medicine, Journal of Neurosurgery, and Neurosurgery established subsections devoted to Neuro ICU care. The Neurocritical Care Society created a dedicated journal, Neurocritical Care, devoted specifically to the growing body of scientific knowledge in this subspecialty area. It has been published since 2004 with Springer with an impact factor of 2.488. It ranks 17th out of 33 journals in the discipline of critical care medicine and 87th out of 193 journals in the discipline of neurology. There are 2 volumes with 6 issues annually and it is directed towards neurointensivists, neurologists, neurosurgeons, medical and surgical intensivists, anesthesiologists, emergency physicians, and critical care nurses treating patients who are critically ill due to nervous system disorders. The first textbook dedicated to the field was published in 1983. As of this year 127 Neuro ICU care texts are available on Amazon.com. Neurointensivists have a knowledge base tailored to the specific needs of their patients. The NCS has worked extensively with other neurological, neurosurgical and critical care societies to develop guidelines to address the unique needs of this population including multi-modality brain monitoring, critical care management of subarachnoid hemorrhage, management of status epilepticus, insertion and management of external ventricular drains, venous thrombosis prophylaxis, and reversal of anticoagulation in intracranial hemorrhage. A Neurocritical Taxonomy Code was recently approved by the National Uniform Claim Committee (NUCC). This code defines Neuro ICU Care as being “devoted to the comprehensive, multisystem care of the critically ill neurological patient." Like other intensivists, the neurointensivist generally assumes a primary role for coordinating the care of patients in the ICU, including both the neurological and medical management of the patient. They must also provide consultative services for these patients as requested within the health system.

b. Explain how this proposed area of focused practice addresses a distinct and well-defined patient population and care need:

Patients with neurological conditions who are critically ill require physicians who are knowledgeable in the examination, evaluation, and options for care of both the primary neurological condition as well as the associated critical care conditions. Integrating the management of these conditions may require approaches that differ from those of the general critical care population and require a physician with
dual training to appropriately manage them. These physicians not only provide direct care, but also lead and train a team of physician extenders, nurses, pharmacists, and other professionals who are aware of the specific needs of the neurological critically ill patient.

c. Please provide information about the group of diplomates concentrating their practice in the area of focused practice, if known:

i. The projected number of such diplomates in total and annually (along with the source(s) of the data):

Given current number of CAST- credentialed neurosurgeons (n=39) and the 22 CAST-accredited fellowships (source Society of Neurological Surgeons), the projected number of new diplomats entering the RFP on an annual basis is between 10-20. The total number of diplomats participating is likely to be 150. It should be noted that CAST has also certified 39 neurologists, 19 internist-pulmonologists, 13 anesthesiologists, 5 emergency medicine physicians and 1 pediatrician. If ABPN, ABA, ABEM eventually join in offering this RFP the numbers should double.

ii. The annual rate of change of such diplomates in the recent past and projected annual rate of change for the near future (along with the source(s) of the data):

See above (also SNS).

iii. The current geographic distribution of this group of diplomates, its projected spread in the next five (5) years, and an explanation of how you arrived at this projection:

Based on current diplomats and the location of the existing CAST training programs we expect a distribution as follows: 10% Southeast, 35% Northeast, 25% Northwest, 20% Southwest with the country divided in quadrants.

d. Please identify the existing national societies that have a significant interest in the area of focused practice:

i. Indicate the existing national societies' size and scope, along with the source(s) of the data:

Neurosurgeons in the United States are represented by the following organizations, all of which are supportive of this NeuCC proposal: The American Association of Neurological Surgeons – 10,960; Congress of Neurological Surgeons - 9,000; American Board of Neurological Surgery - 4616 active neurosurgeons; Joint Section on Trauma and Critical Care - 2530 active members

ii. Indicate the distribution of academic degrees held by their members, along with the source(s) of the data:

MD, PhD, DO

iii. Indicate the relationship of the national societies' membership with the proposed focused practice designation:

SNCC and SNS CAST contain neurosurgeons practicing critical care, and these members and their societies' leadership support recognition of this subspecialty area.
9. Please describe how the cognitive knowledge, clinical and interpersonal skills, professional attitudes, and practical experience of diplomates in this area of focused practice will be distinct from diplomates in other specialties, subspecialties, and areas of focused practice in terms of:
   a. Clinical competence:

   The neurosurgeon participating in the NeuCC RFP will exhibit competency in critical care neurosciences in addition to standard critical care skills and knowledge. They are distinguished from other clinical neuroscientists by their expertise in critical care and from intensivists by their expertise in diverse neurological and neurosurgical pathologies. These additional skills not only include cognitive and procedural aspects but also skills in coordinating the multi-disciplinary nature of the care required by the unique population served. Additionally, they must be competent in managing patients in an ICU environment, which requires skills in patient triage, allocation of resources, and clarification of goals of care. Their cognitive skills will be distinct from neurosurgeons and non-neurosurgeons exclusively practicing NCC in that they will maintain a full-knowledge and skill set in clinical neurosurgery, which from a procedural standpoint as applied to invasive neuromonitoring and recovery strategies will be unique.

   b. Scope of practice:

   Neurological Critical Care encompasses a broad clinical practice spanning general and neurological critical care. The core skill set includes implementation and management of neurological, ventilatory, circulatory, nutritional, renal, hepatic, and metabolic support. Furthermore, fellows should develop a foundation in critical care systems, team-based care, and the use of protocol based care where indicated. Finally, fellows should be introduced to scholarly activity in this field. This is distinct from Neurosurgical Critical Care which encompasses the care of only those patients likely to need neurosurgical procedures or for whom a procedure has already been performed.

   c. Body of knowledge and skills:

   Program Content - Cognitive Skill Set

   Participants in the RFP are expected to provide patient care that is compassionate, appropriate, and effective for the promotion of health, prevention of illness, treatment of disease, and care at the end of life. They must be able to gather accurate, essential information from all sources, including interviews, physical examinations, medical records, and diagnostic/therapeutic procedures. They must be able to make informed recommendations about preventative, diagnostic, and therapeutic options and interventions that are based upon sound clinical judgment, scientific evidence, and patient preference. They must develop, negotiate, and implement effective patient management plans and integrate patient care. They must be able to perform the diagnostic and therapeutic procedures considered essential to the practice of NeuCC with competency. They are expected to demonstrate knowledge of established and evolving biomedical and clinical sciences, and the application of their knowledge to patient care and the education of others. They must apply an open-minded, analytical approach to acquisition of new knowledge. The tools necessary to accomplish these goals can be obtained through practice, fellowship or some combination thereof and will be reinforced, developed and refined during and through the diplomat’s focused practice and the assessments that go along with it.

   Acquisition of the specific cognitive skills by trainees can be accomplished through the use of any of a number of techniques, including supervised direct patient care, didactic sessions, journal clubs, or literature reviews.

   I. Neurological Disease States: Pathology, Pathophysiology, and Therapy
The following are specific diseases, conditions, and clinical syndromes commonly managed by a neurointensivist and will be the focus of clinical practice, focus, education and ongoing assessment:

A. Cerebrovascular Diseases

1. Infarction and ischemia
   • Massive hemispheric infarction
   • Basilar artery occlusion and stenosis
   • Carotid artery occlusion and stenosis
   • Crescendo TIAs
   • Occlusive vasculopathies (Moya-Moya, sickle cell)
   • Spinal cord infarction

2. Intracerebral hemorrhage
   • Supratentorial
   • Cerebellar
   • Brainstem
   • Intraventricular

3. Subarachnoid hemorrhage – aneurysmal and other Vascular malformations
   • Arteriovenous malformations
   • AV fistulas
   • Cavernous malformations
   • Developmental venous anomalies

4. Dural sinus thrombosis

5. Carotid-cavernous fistulae

6. Cervical and cerebral arterial dissections

B. Neurotrauma

1. Traumatic brain injury
   • "Diffuse axonal injury"
   • Epidural hematoma
   • Subdural hematoma
   • Skull fracture
   • Contusions and lacerations
   • Penetrating craniocerebral injuries
   • Traumatic subarachnoid hemorrhage

2. Spinal cord injury
   • Traumatic injury (transection, contusion, concussion)
   • Vertebral fracture and ligamentous instability

C. Disorders, Diseases, Seizures, and Epilepsy

1. Seizures and epilepsy
   • Status epilepticus (SE) Convulsive
     Non-convulsive (partial-complex and “subtle” secondarily generalized SE)

2. Neuromuscular diseases
   • Myasthenia gravis
   • Guillain-Barre syndrome
   • ALS
   • Rhabdomyolysis and toxic myopathies
   • Critical illness myopathy and neuropathy

3. Infections
1. Encephalitis (viral, bacterial, parasitic)
2. Meningitis (viral, bacterial, parasitic)
3. Brain and spinal epidural abscess
4. Toxic-metabolic disorders
   - Neuroleptic malignant syndrome/malignant hyperthermia
   - Serotonin syndrome
   - Drug overdose and withdrawal (e.g., barbiturates, narcotics, alcohol, cocaine, acetaminophen).
   - Temperature related injuries (hyperthermia, hypothermia)
5. Inflammatory and demyelinating diseases
   - Multiple sclerosis (Marburg variant, transverse myelitis)
   - Neurosarcoidosis
   - Acute disseminated encephalomyelitis (ADEM)
   - CNS vasculitis
   - Chemical or sterile meningitis (i.e. posterior fossa syndrome, NSAID induced)
   - Central pontine myelinolysis
   - Others
6. Neuroendocrine disorders
   - Pituitary apoplexy
   - Diabetes insipidus (including triple phase response)
   - Panhypopituitarism
   - Thyroid storm and coma
   - Myxedema coma
   - Addisonian crisis
D. Neuro-oncology
1. Brain tumors and metastases
2. Spinal cord tumors and metastases
3. Carcinomatous meningitis
4. Paraneoplastic syndromes
E. Encephalopathies
1. Eclampsia, including HELLP Syndrome
2. Hypertensive encephalopathy
3. Hepatic encephalopathy
4. Uremic encephalopathy
5. Hypoxic-ischemic and anoxic encephalopathy
6. MELAS
F. Clinical syndromes
1. Coma
2. Herniation syndromes with monitoring & ICP
3. Elevated intracranial pressure and Intracranial hypotension/hypovolemia
4. Hydrocephalus detection & treatment
5. Cord compression
6. Death by neurologic criteria, end of life issues, and organ donation
7. Vegetative state
8. Dysautonomia (cardiovascular instability, central fever, hyperventilation)
9. Reversible posterior leukoencephalopathy
10. Psychiatric emergencies (psychosis)
G. Perioperative Neurosurgical Care
H. Pharmacotherapeutics
I. General Critical Care: Pathology, Pathophysiology, and Therapy
   A. Cardiovascular Physiology, Pathology, Pathophysiology, and Therapy
      1. Shock (hypotension) and its complications (vasodilatory and cardiogenic)
      2. Myocardial infarction and unstable coronary syndromes
      3. Neurogenic cardiac disturbances (ECG changes, stunned myocardium)
      4. Cardiac rhythm and conduction disturbances; use of antiarrhythmic medications; indications for and types of pacemakers
      5. Pulmonary embolism
      6. Pulmonary edema: cardiogenic versus noncardiogenic (including neurogenic)
      7. Acute aortic and peripheral vascular disorders (dissection, pseudoaneurysm)
      8. Recognition, evaluation and management of hypertensive emergencies and urgencies
      9. Calculation of derived cardiovascular parameters, including systemic and pulmonary vascular resistance, alveolararterial gradients, oxygen transport and consumption
   B. Respiratory Physiology, Pathology, Pathophysiology and Therapy
      1. Acute respiratory failure
         • Hypoxemic respiratory failure (including ARDS)
         • Hypercapnic respiratory failure
         • Neuromuscular respiratory failure
      2. Aspiration
      3. Bronchopulmonary infections
      4. Upper airway obstruction
      5. COPD and status asthmaticus, including bronchodilator therapy
      6. Neurogenic breathing patterns (central hyperventilation, Cheyne-Stokes respirations)
      7. Mechanical ventilation
         • Positive pressure ventilation (BIPAP)
         • PEEP, CPAP, inverse ratio ventilation, pressure support ventilation, pressure control, and non-invasive ventilation
         • Negative pressure ventilation
         • Barotrauma, airway pressures (including permissive hypercapnia)
         • Criteria for weaning and weaning techniques
      8. Pleural Diseases
         • Empyema
         • Massive effusion
         • Pneumothorax
      9. Pulmonary hemorrhage and massive hemoptysis
     10. Chest X-ray interpretation
     11. End tidal CO2 monitoring
     12. Sleep apnea
     13. Control of breathing
   C. Renal Physiology, Pathology, Pathophysiology and Therapy
      1. Renal regulation of fluid and water balance and electrolytes
      2. Renal failure: Prerenal, renal, and postrenal
      3. Derangements secondary to alterations in osmolality and electrolytes
      4. Acid-base disorders and their management
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5. Principles of renal replacement therapy
6. Evaluation of oliguria and polyuria
7. Drug dosing in renal failure
8. Management of rhabdomyolysis
D. Metabolic and Endocrine Effects of Critical Illness
   1. Enteral and parenteral nutrition
   2. Endocrinology
      • Disorders of thyroid function (thyroid storm, myxedema coma, sick euthyroid syndrome)
      • Adrenal crisis
      • Diabetes mellitus
      • Ketotic and hyperglycemic hyperosmolar coma
      • Hypoglycemia
3. Disorders of calcium and magnesium balance
4. Systemic Inflammatory Response Syndrome (SIRS)
5. Fever, thermoregulation, and cooling techniques
E. Infectious Disease Physiology, Pathology, Pathophysiology and Therapy
   1. Antibiotics
      • Antibacterial agents
      • Antifungal agents
      • Antituberculosis agents
      • Antiviral agents
      • Antiparasitic agents
   2. Infection control for special care units
      • Development of antibiotic resistance
      • Universal precautions
      • Isolation and reverse isolation
3. Tetanus and botulism
4. Hospital acquired and opportunistic infections in the critically ill
5. Acquired Immune Deficiency Syndrome (AIDS)
6. Evaluation of fever in the ICU
7. Central fever
8. Interpretation of antibiotic concentrations, sensitivities
F. Physiology, Pathology, Pathophysiology and therapy of Acute Hematologic Disorders
   1. Acute defects in hemostasis
      • Thrombocytopenia, thrombocytopathy
      • Disseminated intravascular coagulation
      • Acute hemorrhage (GI hemorrhage, retroperitoneal hematoma)
      • Iatrogenic coagulopathies (warfarin and heparin induced)
   2. Anticoagulation and fibrinolytic therapy
3. Principles of blood component therapy (blood, platelets, FFP)
4. Hemostatic therapy (vitamin K, aminocaproic acid, protamine, factor VIIa)
5. Prophylaxis against thromboembolic disease
6. Prothrombotic states
G. Physiology, Pathology, Pathophysiology and Therapy of Acute Gastrointestinal (GI) and Genitourinary (GU) Disorders
   1. Upper and lower gastrointestinal bleeding
   2. Acute and fulminant hepatic failure (including drug dosing)
3. Ileus and toxic megacolon
4. Acute perforations of the gastrointestinal tract
5. Acute vascular disorders of the intestine, including mesenteric infarction
6. Acute intestinal obstruction, volvulus
7. Pancreatitis
8. Obstructive uropathy, acute urinary retention
9. Urinary tract bleeding
H. Immunology and Transplantation
1. Principles of transplantation (brain death, organ donation, procurement, maintenance of organ donors, implantation)
2. Immunosuppression, especially the neurotoxicity of these agents
I. General Trauma and Burns
1. Initial approach to the management of multisystem trauma
2. Skeletal trauma including the spine and pelvis
3. Chest and abdominal trauma - blunt and penetrating
4. Burns and electrical injury
J. Monitoring
1. Neuromonitoring
2. Prognostic, disease severity and therapeutic intervention scores
3. Principles of electrocardiographic monitoring
4. Invasive hemodynamic monitoring
5. Noninvasive hemodynamic monitoring
6. Respiratory monitoring (airway pressure, intrathoracic pressure, tidal volume, pulse oximetry, dead space, compliance, resistance, capnography)
7. Metabolic monitoring (oxygen consumption, carbon dioxide production, respiratory quotient)
8. Use of computers in critical care units for multimodality monitoring
K. Administrative and Management Principles and Techniques
1. Organization and staffing of critical care units
2. Collaborative practice principles, including multidisciplinary rounds and management
3. Emergency medical systems in prehospital care
4. Performance improvement, principles and practices
5. Principles of triage and resource allocation, bed management
6. Medical economics: health care reimbursement, budget development
L. Ethical and Legal Aspects of Critical Care Medicine
1. Death and dying
2. Forgoing life-sustaining treatment and orders not to resuscitate
3. Rights of patients, the right to refuse treatment
4. Living wills, advance directives; durable power of attorney
5. Terminal extubation and palliative care
6. Rationing and cost containment
7. Emotional management of patients, families and caregivers
8. Futility of care and the family in denial
M. Principles of Research in Critical Care
1. Study design
2. Biostatistics
3. Grant funding and protocol writing
4. Manuscript preparation
5. Presentation preparation and skills
6. Institutional Review Boards and HIPAA

III. Procedural Skills
A. General Neuro-Critical Care
1. Central venous catheter placement; dialysis catheter placement
2. Pulmonary artery catheterization
3. Management of mechanical ventilation, including CPAP/BiPAP ventilation
4. Administration of vasoactive medications (hemodynamic augmentation and hypertension lysis)
5. Maintenance airway and ventilation in nonintubated, unconscious patients
6. Interpretation and performance of bedside pulmonary function tests
7. Direct laryngoscopy
8. Endotracheal intubation
9. Shunt and ventricular drain tap for CSF sampling
10. Performance and interpretation of transcranial Doppler
11. Administration of analgosedative medications, including conscious sedation and barbiturate anesthesia
12. Interpretation of continuous EEG monitoring
13. Interpretation and management of ICP and CPP data
14. Jugular venous bulb catheterization
15. Interpretation of SjvO2 and PbtO2 data
16. Management of external ventricular drains
17. Management of plasmapheresis and IVIG
18. Administration of intravenous and intraventricular thrombolysis
19. Interpretation of CT and MR standard neuroimaging and perfusion studies and biplane contrast neuraxial angiography
20. Perioperative and postoperative clinical evaluation of neurosurgical and interventional neuroradiology patients
21. Performance of lumbar puncture and interpretation of cerebrospinal fluid results
22. Induction and maintenance of therapeutic coma and hypothermia

10. For (a) through (e) below, please project the need for and the effect of the proposed new focused practice on the existing patterns of certification or other areas of focused practice. Please indicate how you arrived at your response.

a. Please indicate whether there is any overlap between this area of focused practice and existing subspecialty certifications or other areas of focused practice.

While there is currently no overlap, there may be a perceived overlap with NCC subspecialty if this SS is approved. The major reason for the need for this overlap is the inability of many neurosurgeons to fully participate in the NCC SS due to restrictions inherent in that program with regard to CAST fellowship training. This in turn could severely limit access of patients to high quality NeuCC as neurosurgeons providing this care would not have a means of ongoing MOC assessment and there would be no ABMS recognized pathway for ensuring either that they were meaningfully engaged, meaningfully educated or successful in adopting that educational program.
b. Please outline plans for evaluation of the impact of the proposed area of focused practice on your own programs of specialty and subspecialty certification and any other areas of focused practice:

The evaluation of the impact of the RFP will be assessed in reference to board certification in Neurosurgery without the RFP by: 1) tracking the number of new diplomats participating; 2) tracking the initial scores on the cognitive MOC tool; 3) surveys to hospitals regarding perceived quality of practitioners. The impact of the RFP via the NCC SS certification led by ABPN and co-sponsored by ABNS, ABA and ABEM will be assessed by: 1) tracking the number of ACGME non-accredited but substantively equivalent fellowships versus the number of ACGME accredited NCC fellowships; 2) surveying hospitals on the comparatively quality of services delivered by practitioners in the two pathways; 3) examining the geographic distribution of practitioners from the two pathways to determine if the RFP is providing increased access for patients.

c. Please outline plans for evaluation of the impact of the proposed area of focused practice on other Member Boards’ programs of specialty and subspecialty certification and any other areas of focused practice:

See above.

d. The impact of the proposed area of focused practice on practice, both existing and long-term, specifically:

i. Access to care (please include your rationale):

The NeuCC RFP differs from the NCC SS in that it allows for non-ACGME fellowship training to count toward the clinical practice experience. Currently none of the CAST-accredited fellowships is ACGME accredited. This pathway would increase the availability of individuals with relevant experience and training in this area thereby increasing access to care.

ii. Quality and coordination of care (please include your rationale):

By increasing the access of neurosurgeons to the field, via recognition of CAST fellowships as a reasonable point of entry, the RFP is likely to improve the coordination of care with neurosurgeons and improve the quality of care by helping to develop advanced invasive approaches to monitoring and early recovery and treatment.

iii. Benefits to the public (please include your rationale):

The benefits to the public are many but the RFP increases access and decreases cost, while bringing to bear the entire breadth of the physician community on the medical care of Neuro ICU patients. By investing and engaging neurosurgeons, who in fact take care of a large percentage of these patients and providing them with meaningful MOC programs the public interest is served.

e. Please explain the effects, if known, of the proposed area of focused practice on:
i. Immediate costs and their relationship to the probable benefits (please indicate your methodology):

The training costs are limited to salary for trainees. The benefits of reduced hospitalization costs and improved outcomes leading to reduced post-hospitalization costs will dwarf the costs of training. Administrative costs to institutions with existing residency programs and UCNS or CAST accredited training programs should not change significantly under the RFP, in contradistinction to the NCC SS, since much of the infrastructure and training costs are already in place.

ii. Long-term costs and their relationship to the probable benefits (please indicate your methodology):

No additional long-term costs are anticipated.

f. Please explain the effects if this area of focused practice is not approved:

If not approved, patient access to rigorously assessed practitioners of all backgrounds is likely to be negatively affected but neurosurgeons in particular will be disproportionately affected as CAST training and practice pathway are their principle mechanisms of entry. Since neurosurgeons provide much of the neurological ICU care in the United States the lost opportunity to make certain these physicians are up to date and focusing their practice will be lost.

11. Please indicate how the proposed area of focused practice will be evaluated periodically (e.g., every five years) to assure that the area of focused practice remains viable:

SNS-CAST (as well as ACGME and UCNS to the degree that this turns out to be relevant) will/have developed Program Requirements in Neurological Critical Care and will accredit and regularly monitor the status and quality of the Training Programs. The performance on the ABNS-administered certification examinations of graduates of accredited Neurological Critical Care programs will be one outcome measure of the quality of those training programs. The ABNS will periodically reassess the number of Neurological Critical Care Training Programs, graduates, candidates for the NeuCC RFP, and participation of diplomates in the RFP's MOC tool.

12. Please list key stakeholder groups from which ABMS may wish to solicit commentary on the proposed area of focused practice:

The Leapfrog Group
American Heart/Stroke Association
Brain Injury Association
Centers for Medicare and Medicaid Services

To be completed for areas of focused practice for which formalized training is currently available to meet some of the requirements for clinical experience and patient volume:

13. Please provide the following information for those training programs that have a primary educational effort devoted to the proposed area of focused practice, along with their geographic locations and the source(s) of the data:

a. Please list the names of training programs in the proposed area of focused practice:

Currently there are 61 UCNS-accredited fellowships: [Source: UCNS website Jan 2, 2017]
1. Baylor College of Medicine
2. California Pacific Medical Center
3. Cedars-Sinai Medical Center
4. Cleveland Clinic Foundation
5. Detroit medical Center/Wayne State University
6. Duke University
7. Emory University Hospital
8. Henry Ford Hospital
9. Hofstra Northwell School of Medicine
10. Johns Hopkins
11. Loyola U Chicago
12. Massachusetts General Hospital
13. Mayo Clinic College of Medicine, Rochester
14. Mayo Clinic Florida
15. Medical College of Wisconsin
16. Medical University of South Caroline
17. Mercy Hospital at Buffalo
18. Mount Sinai Medical Center
19. New York Presbyterian Hospital
20. Northwestern University Feinberg School of Medicine
21. Ochsner Health System
22. Oregon Health and Science University
23. Rush University Medical Center
24. Seton Hall University School of Health and Medical Sciences
25. Stanford University Medical Center
26. SUNY Upstate Medical University
27. The Ohio State University
28. Thomas Jefferson University Hospital
29. Tufts Medical Center
30. United Health Services Hospitals-Wilson Medical Center
31. University Hospitals Case Medical Center
32. University of Alabama Birmingham
33. University of California Davis Medical Center
34. University of California, Los Angeles
35. University of California San Diego Health System
36. University of California San Francisco
37. University of California Irvine
38. University of Chicago
39. University of Cincinnati
40. University of Colorado Hospital
41. University of Kansas School of Medicine
42. University of Maryland
43. University of Massachusetts Medical School/UMass Memorial
44. University of Miami/Jackson Memorial Hospital
45. University of Michigan
46. University of Minnesota Medical School
47. University of Mississippi Medical Center
48. University of North Carolina at Chapel Hill
49. University of Pennsylvania
50. University of Pittsburgh Medical Center
51. University of Southern California
52. University of Tennessee College of Medicine
Currently SNS-CAST has accredited 22 neurocritical care training programs [Source: SNS Website]

I.  Baylor College of Medicine
2.  Brigham & Women’s Hospital
3.  Hofstra North Shore-LIJ School of Medicine
4.  Houston Methodist
5.  Mayo Clinic
6.  Penn State University
7.  Rush University Medical Center
8.  Thomas Jefferson University
9.  Case Western
10. University of Colorado
11. University of Miami
12. University of Michigan
13. University of New Mexico
14. University of Texas, San Antonio
15. University of Wisconsin-Madison
16. Indiana University
17. University of Pittsburg
18. UT-Houston
19. UCSF
20. Emory
21. SUNY-Syracuse
22. U Rochester

b. Indicate the total number of trainee positions available currently (along with the source(s) of the data):

159 (UCNS, SNS websites)

c. Provide the number of trainees completing the training annually (along with the source(s) of the data):

Summing the available data from the UCNS and SNS websites, approximately 50-60 trainees are completing the training annually.

d. Organization(s) providing accreditation or oversight for training programs (Please submit evidence that they have the willingness, capability, and resources to conduct the review of these programs):

The UCNS and CAST have been committed to overseeing high quality Neuro ICU training for several years. Some of the programs overseen by these organizations will come under the auspices of the ACGME as the SS NCC is rolled out by ABMS. Others however may not have the financial resources to do that and CAST is committed to providing the oversight and accreditation for those programs.
14. How much additional clinical experience is required beyond training?

In order to remain in the RFP NeuCC program, the diplomat must demonstrate ongoing commitment to the care of Neurological ICU patients as evidenced by at least 17% of their clinical practice time. It is understood that many will provide these services in concentrated periods so a yearly commitment of 300h is felt to be sufficient. This translates to 7-8 weeks of full time ICU coverage.

**NOTE:** When submitting this application, please attach the following items:

- Copy of proposed application form for the candidates for this area of focused practice *(Attachment 1)*
- A written statement indicating concurrence or specific grounds for objection from each Primary and Conjoint Board having expressed related interests in the same field *(Attachments 2a, 2b)*
- Written comments on the proposed area of focused practice from at least one (1) public stakeholder groups *(Attachment 3)*
- An example of how diplomates will be recognized for this area of focused practice *(Attachment 4)*
Application for ABNS Recognition of Focused Practice in Neurological Critical Care

Applicant:

Academic Title:

Address:

Email: Phone:

Chief of Neurosurgery Department: Phone:

Chief Medical Officer: Institution:

Phone:

Assistant's Name: Assistant's Email:

ACGME Residency Training program / specialty:

Year of residency completion:

Board Certification:

If ABNS certified please supply the following information:

ABNS Certificate #:

If certified by an American Board of Medical Specialties board other then ABNS: Certifying Board:

Certificate #:

If completed a fellowship in critical or Neurological Critical Care (e.g. CAST, UCNS, ACS, Anesthesiology, Neurotrauma and critical care fellowships, etc), please attach certificate or letter from fellowship Director.

Program Name:

Fellowship Director: Year:

In Lieu of Fellowship - Practice Attestation: "My practice complies with one of the following categories: (1) An average of at least 17% of my clinical practice time was spent in the practice of NCC (>300h/y) for past 6y or, (2) 25% (>450 h/y) for 4y or (3) 33% (>600h/y) for 3y or (4) 50% (> 900h/y) for 2y"

Date of Successful Completion of the Neurological Critical Care Examination

Administered by:

Please attach Certificate of Completion

On going - Practice Attestation: "At least 17% of my clinical practice time is spent in the practice of NCC (>300h/y)"
SENT VIA EMAIL
February 23, 2018

Richard E. Hawkins, M.D.
President and CEO
American Board of Medical Specialties
353 North Clark Street, Suite 1400
Chicago, IL 60654

Dear Dr. Hawkins:

The American Board of Anesthesiology (ABA) supports the application by the American Board of Neurological Surgery for a focused practice pathway in Neurological Critical Care.

As you may know, the ABA has submitted an application to ABMS for co-sponsorship of subspecialty certification in Neurocritical Care (NCC). We believe establishment of this subspecialty certification will help to further advance the training and recognition of neurocritical specialists and improve the care of patients.

Our Board of Directors has not yet had opportunity to comprehensively discuss focused practice pathways. Until such time, we cannot make a determination as to whether and when we would pursue a focused practice in any anesthesiology subspecialty.

In the interim, we are supportive of the ABNS application for a focused practice pathway in Neurological Critical Care.

Sincerely,

Deborah J. Culley, M.D.
Secretary

Daniel J. Cole, M.D.
Executive Director, Professional Affairs

cc: E. Sander Connolly, Jr., MD, ABNS Director
Fredric B. Meyer, M.D., ABNS Executive Director
Mary E. Post, MBA, CAE, ABA Executive Director, Administrative Affairs
February 27, 2018

Richard E. Hawkins, M.D.
President and Chief Executive Officer
American Board of Medical Specialties
353 North Clark Street
Suite 1400
Chicago, IL 60654

Dear Dr. Hawkins:

The American Board of Emergency Medicine (ABEM) supports the application by the American Board of Neurological Surgery (ABNS) for a designation in Focused Practice in Neurological Critical Care.

Sincerely,

Terry Kowalenko, M.D.
President

Via email

Cc: John C. Moorehead, M.D., ABMS Chair
    Randall K. Roenigk, M.D., ABMS Committee on Certification Chair
    Mary Nan S. Mallory, M.D., ABMS Committee on Certification Member
    Michael L. Carius, M.D., ABMS Board of Directors
February 16, 2018

Richard E. Hawkins, M.D.
President and CEO
ABMS

Dear Dr. Hawkins,

This letter is to provide the support of the American Board of Psychiatry and Neurology (ABPN) for the application of the American Board of Neurological Surgery (ABNS) for a Focused Practice in Neurological Critical Care (NeuCC). We have had extensive discussions with the ABNS about their proposal and believe that careful consideration has been given to the educational structure and process for this Focused Practice. Even though the ABNS is participating in our application for a subspecialty in Neurocritical Care (NCC), we have come to understand that the Focused Practice option will be a more realistic pathway into neurological critical care for most neurosurgery candidates.

If you need more information concerning our support of the ABNS application, please let me know.

Sincerely,

Larry R. Faulkner, M.D.
President and CEO
ABPN

CC Katherine Torres-Hertz
Fredric B. Meyer, M.D.
February 15, 2018

Fredric B. Meyer, MD
Executive Director
American Board of Neurological Surgery
245 Amity Road, Suite 208
Woodbridge, CT 06525

Re: Neurological Critical Care Recognition of Focused Practice Program,
American Board of Neurological Surgery

Dear Dr. Meyer:

The American Association of Neurological Surgeons (AANS) is delighted
to lend its full support to the American Board of Neurological Surgery’s
application for recognition of focused practice in neurological critical care.
This area of practice has been at the core of neurosurgery since the earliest
days of our specialty. The very nature of what we do provides us with a
unique perspective on the needs of critically ill patients. Our residents
receive daily exposure to and instruction in neurocritical care throughout
their training. Formal recognition of focused practice in this area will
enhance our ability to educate the next generation in this area, to raise
standards, and most importantly, to improve patient outcomes.

As the organization that is formally charged with speaking on behalf of
American neurosurgery, the AANS stands ready to work with you on this
important initiative. Please do not hesitate to reach out whenever we can be
of assistance.

Yours truly,

Alex B. Valadka, MD, FAANS, FACS
President
American Association of Neurological Surgeons
16 February 2018

Fredric B. Meyer, MD
Executive Director
American Board of Neurological Surgery
245 Amity Road, Suite 208
Woodbridge, CT 06525

Re: American Board of Neurological Surgery Recognition of Focused Practice Program for Neurological Critical Care

Dear Dr. Meyer:

The Committee on Advanced Subspecialty Training (CAST) of the Society of Neurological Surgeons (SNS) has for years been developing and then promoting the subspecialty of NeuroCritical Care (NCC) through CAST accreditation of fellowships and certification of its trainees. This subspecialty is an essential element of the training and practice of every neurosurgeon, who by the very nature of the specialty must deal with many types of critically ill patients.

Many neurosurgeons now spend all or a major portion of their practice in the NCC subspecialty, and recognition of their skills has changed the face of the typical ACGME-approved neurosurgical training program. This thoughtful application and its terminology will continue to maintain the various disciplines in neurosurgery within a single umbrella specialty board, while recognizing the need for excellence and practitioners in this subspecialty. This schema facilitates the continued daily exposure and instruction in neurologic critical care throughout each neurosurgery resident’s training, and ensures that these skills will remain within the future armamentarium of every neurosurgeon so as to attain the best care and outcomes for its patients.

CAST is pleased to fully support this proposal of the American Board of Neurological Surgery’s application for recognition of focused practice in neurological critical care. Furthermore, CAST stands ready to work enthusiastically with the ABNS to support this very important program.

Sincerely

[Signature]

Arthur L Day MD
Chairman
Committee on Advanced Subspecialty Training (CAST) of the Society of Neurological Surgeons

CAST CHAIR
Arthur L Day, MD
SECRETARY
Steven Giannotta, MD
MEMBERS
Charles Branch, MD
Antonio Chocone, MD
Shelly Timmons, MD
Douglas Kondziolka, MD
Cormac Maher, MD

CORRESPONDENCE:
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SNS/CAST
5550 Meadowbrook Drive
Rolling Meadows, IL 60008
Email: CAST@ans.org