

## NCS Website

### Neurocritical Care Fellowship Training- Frequently Asked Questions

#### **1. What is neurocritical care?**

Neurocritical care is the intensive care management of patients with life-threatening neurological and neurosurgical illnesses such as massive stroke, bleeding in or around the brain (subarachnoid hemorrhage, intracerebral hemorrhage, subdural hemorrhage, intraventricular hemorrhage), brain tumors, brain trauma, status epilepticus, nerve and muscle diseases (myasthenia gravis, Guillain-Barre Syndrome), spinal cord disorders and the cardiopulmonary complications of brain injury. Neurocritical care provides the interface between the brain and other organ systems in the setting of critical illness. Patients are taken care of within a single specialized unit with expertise in managing the unique needs of such critically ill patients.

#### **2. Who is a neurointensivist?**

Neurointensivists are physicians who have undergone additional subspecialty training to care for the unique needs of patients with acute brain and spinal cord disorders. Like other intensivists, the neurointensivist assumes the primary care role for his or her patients in the ICU, coordinating the neurological, neurosurgical and critical care needs of the patient. Along with treating acute brain and spinal cord injuries, neurointensivists also manage medical complications of neurological and neurosurgical illnesses such as acute respiratory failure, shock, sepsis, arrhythmias and renal failure. Neurointensivists are able to provide complete care for patients by integrating and balancing the management of both the brain and the body. Neurointensivists may perform a wide range of bedside procedures, such as arterial and central venous catheter insertion, endotracheal intubation, intracranial pressure monitor insertion and critical care ultrasound. In many facilities, neurointensivists are the leaders of the multi-disciplinary neurocritical care team.

#### **3. Who can become a neurointensivist?**

The [United Council of Neurological Subspecialties \(UCNS\)](#) provides certification in Neurocritical Care to physicians from the following specialty backgrounds-

- Neurology
- Neurological Surgery
- Internal Medicine
- Anesthesiology
- Surgery
- Emergency Medicine
- Pediatrics
- Equivalent certification by the Royal College of Physicians and Surgeons of Canada (RCPSC).

#### **4. Where can I find a list of Neurocritical Care fellowship programs?**

The complete list of UCNS accredited neurocritical care programs is available [here](#).

The Neurocritical Care Society's interactive map of fellowships is [here](#).

In addition, it is often useful to look at the individual fellowship programs' websites.

#### **5. I am a Neurology resident. How do I become a neurointensivist?**

By completing a 2-year fellowship in Neurocritical Care at a [UCNS accredited program](#) following completion of your residency training.

#### **6. I am an Internal Medicine resident. How do I become a neurointensivist?**

By completing a 2-year fellowship in Neurocritical Care at a [UCNS accredited program](#) following completion of your residency training. You can also do a one-year neurocritical care fellowship following completion of a general critical care or pulmonary/ critical care fellowship.

#### **7. I am an Anesthesia resident. How do I become a neurointensivist?**

By completing a 2-year fellowship in Neurocritical Care at a [UCNS accredited program](#) following completion of your residency training. You can also do a one-year neurocritical care fellowship following completion of a general critical care fellowship. Neurocritical care is also typically an important component of fellowship training in neuroanesthesia, available following an anesthesia residency- a [list of neuroanesthesia/ neurocritical care fellowships](#) is available from the Society for Neuroscience in Anesthesia and Critical Care (SNACC)-

#### **8. I am an Emergency Medicine resident. How do I become a neurointensivist?**

By completing a 2-year fellowship in Neurocritical Care at a [UCNS accredited program](#) following completion of your residency training. You can also do a one-year neurocritical care fellowship following completion of a general critical care fellowship.

#### **9. I am a Neurosurgery resident. How do I become a neurointensivist?**

The UCNS offers certification in neurocritical care following fellowship training of **one-year** duration to candidates who have completed residency training (or a minimum of four years of post-graduate clinical training) in neurosurgery. The fellowship can therefore be enfolded into residency training, but only at a PGY-5 level or greater and must be completed in 12 contiguous months. One-year [Committee on Advanced Subspecialty Training \(CAST\) fellowships](#) in neurocritical care (which may be enfolded in blocks of at least 4 months, or completed following residency training) are also available through the Society of Neurological Surgeons.

**10. I am a Critical Care Fellow. How do I become a Neurointensivist?**

The UCNS offers certification in neurocritical care following fellowship training of **one-year** duration to candidates who have completed post-graduate fellowship training in anesthesia critical care, surgical critical care, or internal medicine critical care that requires at least six months of critical care training. Remember that the match for neurocritical care fellowships occurs a year prior to the start of fellowship training, and that applications through the SF Match are typically submitted at least 6 months prior to the match! Go to the [SF Match website](#) or contact individual programs directly to find unfilled (post-match) positions that might allow you to matriculate into a program without waiting for the next match cycle.

**11. Where can I find information on neurocritical care fellowship programs with immediate vacancies and post-match unfilled spots?**

Information on immediate vacancies and post-match unfilled spots is available at the [SFmatch website](#), here. You can also contact individual programs to inquire about vacancies.

**12. How long is neurocritical care fellowship training?**

Neurocritical care fellowships accredited by UCNS will be completed in 2 years, EXCEPT for candidates who are eligible for the 12 month curriculum by having completed an anesthesia, surgery or internal medicine critical care fellowship **or** have the requisite duration of post-graduate clinical training in Neurosurgery (see above).

**13. Are neurocritical care fellowships Accreditation Council of Graduate Medical Education (ACGME) accredited?**

No, neurocritical care fellowships are accredited by the United Council of Neurologic Subspecialties (UCNS).

**14. Can I obtain American Board of Medical Specialties (ABMS) certification in Neurocritical Care?**

No. [Certification in Neurocritical Care](#) is also provided by the United Council of Neurologic Subspecialties (UCNS).

**15. What is the UCNS and what does it do?**

[UCNS](#) is a nonprofit organization that **accredits** training programs (fellowships) in neurologic subspecialties and awards **certification** to physicians who demonstrate their competence in these subspecialties. Some other subspecialties covered by the UCNS are neuro-oncology, neuro-imaging, headache medicine, interventional neurology, geriatric neurology, clinical neuromuscular pathology, behavioral neurology/ neuropsychiatry and autonomic disorders. An important goal of accreditation and

certification provided by UCNS is to enhance the quality of training for physicians in neurological subspecialties that may not be covered by the ACGME and ABMS.

**16. How do I apply to Neurocritical Care fellowships? <Link to SFmatch application information>**

Most neurocritical care fellowships offer positions through the San Francisco Match (SFmatch). You will need to first submit your applications through the SFmatch Central Application System (CAS). Applicant registration at SFmatch.org typically opens approximately 21 months prior to the commencement date of fellowship training. Deadlines for receipt of completed applications through the CAS vary and are program-specific. The match itself occurs approximately a year prior to the commencement date of fellowship training. More information on applying through the SFmatch is available [here](#). The match calendar is available [here](#).

**17. What procedures does a neurointensivist typically perform?**

The procedural skills included in the Core Curriculum of the UCNS are listed below:

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 analgesedative 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 SjvO<sub>2</sub> and PbtO<sub>2</sub> 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

***In actual practice, the range of procedures performed by a neurointensivist will depend on the training the individual has received, the specific privileges their institution is willing to bestow and local practice patterns.*** Similar to other intensivists, most neurointensivists routinely insert arterial and central venous catheters, manage mechanical ventilation and vasopressors and have at least some expertise in airway management. Many routinely perform endotracheal intubation, bronchoscopy, thoracentesis, tube thoracostomy, bedside tracheostomy, lumbar drain insertion, interpretation of electroencephalography (EEG), goal directed critical care ultrasound, transcranial doppler and insertion of intracranial catheters/ monitors.

**18. How much does a neurointensivist make?**

A link to the most recent salary survey of neurointensivists is available [here](#).

**19. What are the employment opportunities for neurointensivists? Will I easily get a job?**

While there is no specific data on the percentage of graduating neurocritical care fellows who obtained full time neurocritical care employment, there are typically many open positions advertised for neurointensivists. While most graduating fellows will likely obtain employment in the field, the mix of available positions in academia and private practice may be evolving. A list of open positions can be found on the Neurocritical Care website [here](#).

**20. Are combined fellowships available (neurocritical care/ stroke, neurocritical care/ neurointerventional, neurocritical care/ general critical care)?**

Many individuals have completed fellowship training in allied disciplines, such as stroke, interventional neuro and general critical care, in addition to accredited training in neurocritical care. For the most part, such training is likely to be sequential. Combined fellowships in which the total duration of training is shorter than the required duration of each individual fellowship are uncommon because of the more stringent accreditation requirements present today for most subspecialty training programs. You will have to inquire with individual programs.

**21. I am an international medical graduate...**

***1. Can I do a neurocritical care fellowship in the United States without completing residency in the US first? if so, can I obtain a license to practice in the US afterward?***

You must have completed residency training in an ACGME accredited program and be ABMS board certified or eligible to enter a UCNS-accredited neurocritical care fellowship program (equivalent certification by the Royal College of Physicians and Surgeons of Canada is acceptable). Some neurocritical care fellowship programs have, however, offered positions to international medical graduates without residency training in North America. Such training may not lead to UCNS certification. You will have to inquire with individual programs.

For the most part, post-graduate (residency) training in the United States is necessary to obtain an unrestricted license to practice in the US.

***2. What visas do neurocritical care fellowship programs sponsor?***

Several programs offer J-1 visa sponsorship. It is important to be aware of all associated regulations (such as the 2-year home country requirement) and documentation requirements associated with J-1 visa sponsorship. Fewer programs offer H1B visa sponsorship, because of issues related to training vs work visas and prevailing wage laws. Remember that programs have varying levels of familiarity with visa sponsorship- be sure to address all relevant institutional rules and requirements at the time of your fellowship interview, prior to submission of your rank order list.