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Elevating Stroke Care: Navigating the Transition from Primary Stroke to Comprehensive Centers

By Tom Devlin, MD, PhD & Michelle Luffey, MSN, RN, NE-BC

PSCs provide essential care for patients with acute stroke, focusing on rapid diagnosis and treatment to improve outcomes. However, as stroke care continues to evolve, some PSCs are pursuing CSC designation to offer more specialised care for complex cases. This article examines the necessary infrastructure, staffing and financial considerations involved in making this transition, and the potential advantages and risks associated with becoming a CSC.

Transitioning from a PSC to a CSC requires significant infrastructure to meet the specific needs of advanced stroke care. While this infrastructure is commonly found within large academic medical centres, it is possible to build what is needed within tertiary and community hospital settings. Creating a specialised neurocritical care unit (NCCU) is a positive step, as the accreditation standards do not mandate that the unit should exclusively cater to stroke or neuroscience patients. Therefore, other services can also utilise the unit. It should be equipped to provide continuous cardiac, respiratory, and intracerebral monitoring; advanced life support; and rapid intervention for patients with severe stroke and related neurological complications.

As a CSC, the NCCU must be staffed to manage stroke patients of any severity—therefore, 24/7 neurointensivist coverage is a mandatory certification requirement.[2] This can be achieved in a variety of ways through the deployment of physicians who are board certified in neurocritical care, or other critical care specialists, such as pulmonary critical care physicians who have completed certification in emergency neurological life support (ENLS) and essentials of neurocritical care (ENCC), which are offered by the Neurocritical Care Society.

Training and Resources

In many new and established CSCs, advanced practice providers (APPs) with neurocritical care and cerebrovascular experience are often critical to around-the-clock programme success.[1,2] It is crucial to ensure that the care provided by neurocritical care-trained nurses is consistent as well. Training should include ventriculostomy and external ventricular drainage apparatus function; treatment of blood pressure abnormalities and increased intracranial pressure; care of patients with intracranial haemorrhage (ICH), subarachnoid haemorrhage (SAH) following thrombolytic therapy and post-surgical intervention; management of intubated/ventilated patients; and detailed neurologic assessments and scales (i.e. National Institutes of Health stroke scale [NIHSS] and Glasgow coma scale).[3] The necessary training can be acquired either through a programme developed internally or by having nurses obtain certifications in ENLS and ENCC.

For patients who are no longer in critical care or do not require intensive care, it is important to have a designated stroke unit with acute care or step-down beds. The staff in this unit should have specialised training and education in managing acute stroke patients. While it is not required for certification that the unit houses only stroke patients, there is research indicating that a patient is more likely to be alive, independent, and living at home one year after a stroke, if they were cared for in a discrete stroke unit.[3] Internal training and development programmes can be established to build a skilled and experienced team. Further, by encouraging collaboration and shared learning between existing staff and new hires, you can foster a strong team culture to provide high-quality care for this complex patient population.

Before the patient ever arrives in the NCCU or another stroke unit, initial acute care is provided in the emergency room (ER), which is likely already a focal point of your current primary stroke programme. The quick identification of potential stroke, prompt assessment and immediate transfer of patients to computed tomography (CT) scanning remains a crucial focus of your stroke alert process.

The primary difference between the PSC and CSC programmes lies in the coordinated emergency response that includes a dedicated stroke team available on-site 24/7.[2] A PSC may have private-practice neurologists taking calls from their office or home, or they may use a telestroke service for immediate video connection. On the other hand, the CSC has in-house resources to respond promptly to emergencies in the ER. This can be accomplished with the implementation of a neurohospitalist programme comprised of a combination of vascular neurologists and specially trained neurology advanced practice providers (APPs). The deployment of this service not only provides practitioners the opportunity to address the immediate needs in the acute phase of stroke but also ongoing patient care management throughout the hospital stay.

CSCs provide expert consultation and support to other hospitals and emergency medical service (EMS) providers as well, necessitating the deployment of a dependable telehealth platform.[4] As an advanced stroke care provider, the facility will serve as a hub for primary and acute stroke-ready hospitals looking to transfer higher acuity patients—especially those in need of mechanical thrombectomy or surgical intervention. Hospitals and clinics can also partner with the CSC to offer immediate evaluation and treatment for patients with acute stroke symptoms, including determining the need for thrombolytics or interventional services in the case of a large vessel occlusion (LVO) stroke.

Providing a Leadership Role

Beyond assisting hospitals with stroke triage services and transfer of higher acuity patients, the CSC should take a leadership role in the region to develop a regional stroke system of care (SSOC) if one does not yet exist or ensuring that an existing SSOC is making progress in elevating the quality of stroke services provided to the region.

There is also a responsibility for providing stroke education to hospitals, providers, healthcare workers, EMS, and the public. Included in the leadership role of the CSC is to educate referral centres on technology that can elevate quality care throughout the SSOC. The CSC may help referral centres evaluate and incorporate telemedicine into their programmes. Teleneurology can be a critical solution for referral centres to assure quality emergent neurologic care and neuro-rounding services that can minimise futile transfers and drive referral hospital revenue. Additionally, the CSC should actively educate referral centres about the use of artificial intelligence (AI)-based, web-based systems that can facilitate stroke diagnosis and streamline emergency patient workflow.

CSCs must have an interventional neuroradiology (INR) suite equipped with a biplane angiography and neuroendovascular devices for the treatment of acute ischaemic stroke.[5] Sharing this suite with other interventional services, such as cardiology or interventional radiology, is possible. However, it is important to have a plan in place to swiftly clear the table in the event of an emergent stroke intervention. It is also necessary to have a backup plan for an alternate lab to complete the intervention if needed. This could be another cath lab suite, interventional radiology suite, or even a hybrid operating room (OR) within the facility. The neurointerventional suite should be staffed by interventional neurologists, neurosurgeons, neuroradiologists, or other specialists with expertise in endovascular stroke interventions including mechanical thrombectomy.

The decision around which type of provider to recruit may require a more strategic approach. Many primary stroke programmes in either a tertiary care facility or community hospital might not have the robust vascular neurosurgery services required for comprehensive stroke care. If this is the case, it may make the most sense to recruit vascular neurosurgeons with endovascular training who can meet the needs for both open vascular neurosurgery and endovascular neurointervention. And, depending on the potential volumes of both endovascular and open surgical cases, there may still be a need to supplement the endovascular team with either an endovascular neurologist or neurointerventional radiologist to manage the call burden.

Financial Factors

A full financial pro forma including market analysis should be performed to evaluate the financial implications of moving to a CSC. In order for the organisation to make an informed decision regarding the feasibility of moving to comprehensive stroke, it is crucial to have a thorough understanding of the market opportunities in neurosurgery and neurointervention. There are financial advantages in making this move given the increased reimbursement for higher complexity cases and the research funding opportunities; however, there are significant initial and ongoing investment costs to consider as well.

In case the organisation lacks an interventional suite equipped with biplane imaging, it might be necessary to construct a new room or renovate an existing lab, both of which would entail construction expenses. The biplane imaging system cost, on average, is approximately US$1.8 million compared to the single plane imaging system at approximately US$1.2 million. To assure programme success—for new and ongoing programmes—it is essential that CSCs develop a core finance oversight group to regularly review neuroscience-specific financial reports to determine opportunities for financial optimisation. This group must include a combination of data warehouse, coding, documentation, revenue integrity, patient access and clinical experts to fully maximise financial savings and growth.

The surgical needs for complex vascular neurosurgery will require the facility to be equipped with advanced surgical tools, such as stereotactic navigation systems and intraoperative imaging. Having these advanced surgical capabilities will allow surgeons to perform additional surgical cases beyond those needed for stroke intervention, bringing additional complex surgical case volume to the facility. The additional surgical volume may provide a good financial opportunity for the facility but does have to be weighed against the additional operational costs associated with the need for 24/7 staffing of specialised personnel and maintaining advanced equipment. These ongoing costs must be carefully managed to ensure financial sustainability.

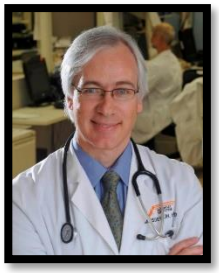
The Final Decision

If the market analysis validates the volume opportunity, movement to a CSC can be advantageous for an organisation. Achieving CSC designation can improve a hospital's reputation in the community and among referring providers, potentially leading to increased patient referrals and revenue. The prestige associated with CSC designation can also attract skilled medical professionals, including neurologists, neurosurgeons, and neuroradiologists, who may bring additional revenue-generating procedures and services to the hospital. CSCs manage a higher volume of patients, including complex cases that often require specialised interventions. This can result in increased reimbursement rates from insurance providers and government programmes, leading to higher overall revenue for the hospital.

These infrastructure, staffing and financial considerations are not an all-inclusive review of what is involved in moving from PSC to CSC. Transitioning is a significant undertaking that requires careful planning, investment, and ongoing management. However, if done correctly, it can lead to improved patient outcomes, increased reputation and prestige, and higher overall revenue for the hospital.[6]

Seeking assistance from experienced consultants can help ensure that your organisation navigates this complex process successfully and makes informed decisions about the infrastructure, staffing and financial aspects of becoming a CSC. As the landscape of stroke care continues to evolve, partnering with experts will help your organisation stay ahead of the curve and provide the highest level of care for this complex patient population.

Michelle Luffey is a Senior Vice President at Corazon, Inc., which offers strategic program development for the cardiovascular, neuro, orthopedic, and surgical specialties. Corazon provides a full continuum of consulting, recruitment, interim management, and accreditation services for hospitals, health systems and practices of all sizes across the country and in Canada. To reach the authors, call 412-364-8200 or email mluffey@corazoninc.com



Thomas Devlin is the director of the Catholic Health Initiatives (CHI) Memorial Stroke and Neuroscience Center (Chattanooga, USA); director of the Chattanooga Center for Neurologic Research LLC; medical director of the Neuroscience Innovation Foundation; co-director of CommonSpirit/National Neuroscience Collaborative; and a professor of neurology at the University of Tennessee Health Science Center (Memphis, USA).

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