

## **Nursing Care of Delaware’s Stroke Patients**

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### **Abstract**

This article will highlight essential nursing care in each aspect of the continuum of stroke care. Nursing interventions will be covered from primary stroke prevention through the transitions needed for healthy return to the community and secondary stroke prevention.

### **Introduction**

With nearly 800,000 strokes occurring annually in the United States,<sup>1</sup> every nurse—regardless of their role—has the potential to experience caring for a stroke patient somewhere along the patient’s stroke journey. The American Heart Association (AHA) describes stroke as “a devastating disease with significant personal, family and health system impacts.”<sup>2</sup> Stroke is a leading cause of long-term disability in the US. Between 2018 and 2019 the United States’ stroke-related costs were more than \$56 billion dollars.<sup>1</sup> Nurses play a pivotal role in the care of acute stroke patients and prevention of future stroke.

This article will highlight essential nursing care in each aspect of the continuum of stroke care. Nursing interventions will be covered from primary stroke prevention through the transitions needed for healthy return to the community and secondary stroke prevention. In addition, nursing advocacy opportunities for the “right care, at the right time, in the right setting” will be highlighted.<sup>3</sup> Nurses are integral to effective education and communication within each aspect of stroke care. To ensure safe transitions, it is important to understand each aspect of the stroke care continuum.

### **Prevention**

Stroke prevention is an essential component of nursing stroke care. Modifiable stroke risk factors include hypertension, diabetes, smoking, hyperlipidemia, cardiovascular disease, atrial fibrillation, hypercoagulopathy, carotid stenosis, oral contraceptive use, obesity, and drug and alcohol abuse. Non-modifiable stroke risk factors include age 55 or older, family history of stroke, previous stroke, or transient ischemic attack (TIA), and sickle cell disease.<sup>4</sup>

Individuals in the State of Delaware have higher rates of hyperlipidemia, drug/alcohol use, and smoking than the national average. Nurses can work to educate their patients on how to reduce their risk of stroke through understanding the various ways of reducing cholesterol; as well as reducing or eliminating drug, tobacco, and alcohol use. These risk factors could be addressed at every patient contact in Delaware.

According to the Centers for Disease Control and Prevention (CDC) stroke facts website, only 38% of people knew to call 911 when they recognized the major symptoms of stroke.<sup>1</sup> There is less disability leading to more independence three months after a stroke in patients who arrive at the emergency department (ED) within three hours of symptom onset than those who access care

later. Delaware nurses could prevent significant disability from stroke via community education on stroke recognition, and by instruction to activate the emergency medical system (EMS) at the first sign or symptom of a stroke.<sup>1</sup>

## **Advocacy**

The American Heart Association (AHA) suggests that stroke systems of care should work to ensure stroke patients receive appropriate treatment as fast as possible. Nurses can participate in Delaware's Stroke System of Care Stroke Committee's public virtual meetings to ensure patients get to the right location for the right treatment at the right time. Information regarding these meetings can be found <https://publicmeetings.delaware.gov/#/meeting/75647>.

## **Recognition**

Early recognition of stroke is critical, as treatments for acute ischemic and hemorrhagic strokes are time dependent. For ischemic strokes, restoration of blood flow and oxygen to brain tissue at-risk for permanent damage can be achieved via intravenous thrombolytic medications or mechanical thrombectomy. The damage to the area of at-risk tissue (the penumbra) can be minimized with acute treatments. Early detection is essential to make treatment with intravenous thrombolytics or mechanical thrombectomy possible.

Nurses working triage in EDs receive regular education on stroke recognition. But any nurse in any location could potentially find themselves witnessing the onset of stroke. Sometimes it is recognized when a patient in the specialist's office cannot get their words out; other times it is recognized when a patient comes into or calls their primary care provider's (PCP's) office with double vision. Stroke could even be recognized when a patient has a drooping face coming out of anesthesia after a procedure.

Being familiar with signs and symptoms of stroke will help you recognize stroke and respond appropriately. BE-FAST is an acronym for stroke recognition indicating Balance, Eyes, Face, Arm, Speech, and Time. Is the patient's balance off? Watch for sudden loss of balance. Any change in vision? Sudden blurred or double vision or loss of vision in one or both eyes? Is one side of their face drooping? Ask the person to smile. Is an arm weak? Ask them to raise both arms. Is their speech impaired? Ask them to repeat a simple phrase.

In addition to these signs and symptoms, hemorrhagic strokes can present with the worst headache of the patient's life, nausea and vomiting, photophobia (light sensitivity), and nuchal rigidity (neck stiffness). When any of these symptoms are recognized, it is time to call 911 or activate your hospital's in-house stroke response system.

## **Advocacy**

Nurses can participate in community education for recognition of stroke as a 911-worthy emergency. Sharing stroke education across social media pages is a simple action with potentially broad benefits. Shareable links can be found on the Delaware Division of Public Health's Facebook, Twitter, and Instagram pages.

## **Accessing Emergency Care**

To obtain lifesaving stroke treatment, people should call 911 to have an ambulance transport them to a hospital ED. Instructions to call 911 to get to a hospital are crucial to decrease

symptom onset to treatment time because this can significantly improve patient outcomes. For this reason, nurses should advise community members not to drive someone having a stroke to the hospital, nor should they go to a medical aid unit, or make a doctor's appointment. All these actions can contribute to significant delays leading to ineligibility for urgent treatment.

For hospitalized patients who display signs and symptoms of stroke, one Delaware hospital has developed the acronym "STROKE" to guide bedside nurses to ready patients for evaluation for emergent stroke treatment eligibility.

Symptoms – what stroke symptoms are noted?

Timing – what is the time the patient was last seen as “normal”?

Ready for CT scan– is the patient ready to move (i.e. sling is under the patient, there is a clear path in the room, an oxygen tank is prepped and ready)?

Obtain – have the patient's vital signs and blood sugar been taken? Is 20 G IV prepped?

Know your patient – what is the patient's code status, past medical history, reason for visit, recent pain/sedating medication?

Eat – Keep patient NPO until the CT scan is complete and after a stroke swallow screen can be completed

## **Emergent Care**

Nurses provide emergent stroke care in multiple venues such as the ED, interventional radiology suite, and intensive care units. Through standardized stroke evaluation processes, nurses can improve treatment decisions and care delivery times, thereby improving outcomes for stroke patients.

When someone arrives at a hospital ED with new stroke signs and symptoms, the first questions asked are “when did the symptoms start? When was the patient last seen as normal?” This information is imperative to guide what happens next. The healthcare team needs to make decisions on whether this potential stroke patient is eligible for either of the two main emergent stroke treatments available.

The first treatment option is an intravenous medication known as a thrombolytic which works to dissolve a clot blocking blood flow. The maximum time window to receive thrombolytic treatment is 4.5 hours since the patient was last seen as normal. The second treatment is a specialized procedure known as a thrombectomy, where the clot is removed. The maximum time window to be eligible for the thrombectomy procedure is 24 hours from last seen normal in most cases. Because the time window is not the only criteria for urgent treatment, the healthcare team must have expertise in identifying eligible patients.<sup>4</sup>

Once a patient meets certain criteria, the stroke evaluation process starts with nurses and physicians collaborating with other team members to quickly obtain critical information needed for decision making regarding emergent treatment. This rapid process includes obtaining information on patient history, home medication list, blood tests and—most importantly—a CT scan of the brain. Since “time is brain,” the quicker the eligible patient receives stroke treatment, the more brain cells are saved.

Hospitals use data metrics to monitor outcomes and determine how quickly treatment is provided. Nurses play a vital role in these data metrics, especially door-to-needle (time of ED arrival to time of thrombolytic delivery) and door-to-puncture (time of ED arrival to initial thrombectomy skin puncture).

The ED nurse has many responsibilities during the stroke evaluation process, including identifying potential stroke patients at the triage desk, multiple clinical assessments, transporting the patient safely and quickly to CT scanner and the thrombectomy lab, obtaining blood for lab tests, and administering all medications including the thrombolytic to those who are eligible. In addition, the ED nurse collaborates with the physician and other team members on critical information such as vital signs, blood pressures, neurological assessments, as well as keeping the family informed. Nurses are also key to the in-hospital stroke evaluation process for admitted patients who show signs of an acute stroke.

Once the stroke evaluation process has been completed in the ED, the patient will be admitted to the hospital. The ED nurse provides a comprehensive report with important clinical information to the admission unit nurse team to ensure a seamless transition, as well as a positive outcome.

## **Acute Care (Hospital Stay)**

Hospital care is essential in cases of acute stroke, and stroke trained nurses have a prominent role in contributing to patient outcomes during acute hospitalization. Nurses at all levels have a hand in the creation of interdisciplinary, internal, evidence-based policies, and protocols, as well as putting those stroke protocols into practice at the bedside.

Best practices or standards of care include a stroke swallow screen assessment before any oral intake, neurologic assessments as ordered, and blood pressure and glucose control as ordered. Other important assessments nurses should monitor are deep vein thrombosis risk, fall risk, hydration, nutrition, mobilization, and pressure ulcer risk. Nurses trained in these interventions are extremely important for identifying and preventing post-stroke complications.

Once admitted to the hospital, stroke patients' lives are dependent on expert nurses monitoring for and identifying signs and symptoms of dangerous post-stroke complications including hemorrhagic transformation, brain swelling, brain herniation, seizure, pneumonia, bowel and bladder problems, depression, and falls. Some of the early signs and symptoms of these complications are headaches, nausea and vomiting, confusion, decreased level of arousal, restlessness, speech changes, visual changes, and motor weakness. Late signs and symptoms include pupillary changes, hemiplegia, unresponsiveness, abnormal posturing, and changes in respiratory patterns.

## **Stroke Centers**

Thrombolytic therapy is the standard of care for acute ischemic stroke, and any ED can provide this treatment. The Joint Commission (TJC) has several levels of stroke center certification for acute care facilities. All adult acute care hospitals in Delaware, except for the Veteran's Administration, have been certified by TJC as Stroke Centers. Certified stroke centers balance the required medical care necessary to achieve good outcomes with discharging the patient as quickly and safely as possible. There are currently six Primary Stroke Centers, one Comprehensive Stroke Center and one Acute Stroke Ready Hospital designation in the State of Delaware.

Primary Stroke Centers and Acute Stroke Ready Centers administer thrombolytics, while Comprehensive Stroke Centers administer thrombolytics and also perform thrombectomies and engage in complex hemorrhagic stroke care. All Delaware hospitals have protocols in place to transfer patients to the appropriate stroke center depending on specific patient criteria.

With each designation, there are stringent eligibility criteria, as well as strict standards and core measures each hospital is required to meet. Nurses have a great deal of responsibility in achieving a majority of these stroke core measures, all of which contribute to better patient outcomes. Some of the core measures and standards specific to patients during hospital admission include:

- An NIH Stroke Scale (a stroke severity scale) is completed within 12 hours of arrival for patients who do not undergo emergent stroke therapy. For those undergoing acute therapies, NIHSS is obtained prior to treatment.
- Prophylaxis against venous thromboembolism is acquired by end of hospital day two for both ischemic and hemorrhagic stroke patients.
- Ischemic stroke patients are administered antithrombotic therapy by the end of hospital day two.
- Ischemic or hemorrhagic stroke patients are assessed for rehabilitation service needs.
- Patient and family stroke education: ischemic or hemorrhagic stroke patients or their caregivers are provided written educational materials during the hospital stay addressing the activation of EMS, the need for follow-up after discharge, medications prescribed at discharge, personal risk factors for stroke, and warning signs and symptoms of stroke.
- Ischemic stroke patients are prescribed antithrombotic therapy at hospital discharge.
- Ischemic stroke patients with atrial fibrillation/flutter are prescribed anticoagulation therapy at hospital discharge.
- Ischemic stroke patients are prescribed statin medication at hospital discharge.

There are also additional Comprehensive Stroke Center measures that focus on complex stroke patients such as those who receive thrombolytic and thrombectomy urgent treatments, as well as hemorrhagic stroke patients.

## **Advocacy**

Nurses can advocate for designated stroke units, as the benefits conveyed from these units are well documented.

## **Post-Acute Care**

Patients and their families often seek the opinions of acute care nurses regarding which post-acute care setting would be best for them. Therefore, understanding the post-acute care delivery system is a vital component of the acute care nurse's knowledge base.

The post-acute stroke care spectrum includes Inpatient Rehabilitation Facilities (IRF), Skilled Nursing Facilities (SNF), discharge to home with home health therapies, and discharge to home

self-care. On average, a little more than 52% of stroke patients are discharged to facilities, with approximately 24% going to IRFs and 27% going to SNFs.<sup>3</sup>

IRFs require stroke patients to participate in 15 hours of skilled therapy per week. They are staffed by registered nurses 24 hours a day, many of whom are certified in rehabilitation nursing specialty practice. IRFs also require that stroke patients are likely to be discharged to the community.

SNFs do not have specific skilled therapy requirements and do not require 24-hour registered nurse staffing. Both types of inpatient facilities work on improvement in mobility, self-care, and cognition which can lead to lower hospital readmission rates. The AHA/American Stroke Association recommends care at the IRF level.<sup>3</sup>

For more information, nurses can access the association of rehabilitation nurses' detailed descriptions of post-acute care settings:

[https://rehabnurse.org/uploads/membership/ARN\\_Care\\_Transitions-Levels\\_of\\_Care.pdf](https://rehabnurse.org/uploads/membership/ARN_Care_Transitions-Levels_of_Care.pdf).

Additional information can also be found at The Centers for Medicare and Medicaid website, where facilities can be compared to assist patients and families in their decision:

<https://www.medicare.gov/care-compare/>.

## **Transition to Home**

Transitioning from an inpatient setting to home is typically when family caregivers must assume the caregiving role. This transition is a particularly vulnerable time in the stroke patient's care continuum. Therefore, the caregiver should be assessed for the skills, capacity, and resources to provide care their loved one's needs. Recent research showed that caregiver assessment tools could be used to create tailored care plans and interventions resulting in improved health and decreased strain of the patient's home caregiver.<sup>3</sup>

Measures of successful home discharge and stroke recovery have not been clearly defined, but avoiding complications that can lead to hospital readmission is a goal shared by patients, families, and inpatient facilities alike. Hindrances to home discharge safety include patient comorbidities, cognitive deficits, medication regimens, as well as fatigue. Difficulty with access to and management of clinic and therapy appointments also contributes to home discharge complications.

There are several nursing interventions that may prevent hospital readmission: post-discharge phone calls, medication reconciliation, clinic or home visits, education on the signs and symptoms of stroke, and helping patients access primary care with a treatment plan handoff to the PCP.<sup>3</sup> Current health care industry trends are moving toward care coordination to ensure safe return home; frequently, that care coordinator is a nurse. Whether their title is Stroke Nurse Liaison, Nurse Navigator, or Post-Acute Coordinator, nurses can support discharge, arrange home follow up, and ensure specialized stroke services are accessed as appropriate.

Patients have reported that limited support in accessing community services contributes to hospital readmissions.<sup>2</sup> The community-based nurse can help access community resources such as meal delivery, outpatient therapies, transportation, and support groups.

## **Advocacy**

Nurses can advocate for the use of caregiver assessment tools before home discharge. In addition, nurses can lead stroke support groups.

## **Preventing the Next Stroke**

Helping patients prevent another stroke is paramount. Ideally, secondary stroke prevention education would be initiated during the acute care stay and reinforced at each subsequent patient contact. Education on personal stroke risk factors and interventions help patients and their caregivers prevent future events. The importance of adherence to prescribed medication regimens needs to be emphasized. Education on vascular risk factors including diabetes, hyperlipidemia, hypertension, and smoking cessation are essential components of secondary stroke prevention.

## **Advocacy**

Nurses can encourage safe physical activity and healthy eating at each opportunity.

## **COVID's Effect on Nursing Care of the Stroke Patient**

Nursing care has a direct impact on stroke patient outcomes. Multiple nurse interventions are essential to drive positive patient outcomes, therefore, nursing shortages put a strain on stroke health care delivery processes. The recent COVID pandemic hit the nursing profession hard, leading to staffing shortages nationwide. Fortunately, organizations are looking at this challenge and providing guidance with long term solutions. The American Nursing Association (ANA) and American Association of Critical Care Nurses (AACN) convened a nurse staffing task force and in 2023 released recommendations for addressing the current nursing shortages.<sup>5</sup> The following are the key recommendations outlined by this group<sup>6</sup>:

1. Reform the work environment.
2. Innovate for models of care delivery.
3. Establish staffing standards that ensure quality.
4. Improve regulatory efficiency.
5. Value the unique contribution of nurses.

Hopefully these recommendations, along with additional expert ideas, will help alleviate the nursing shortage and make the profession even stronger.

## **Summary**

Nurses are integral to effective education and communication to ensure safe transitions. Meeting the patient and caregivers where they are on the health literacy spectrum is a daily practice for nurses. We can use this skill to address and reinforce topics such as secondary stroke prevention, stroke recognition, medications, smoking cessation, physical care for the stroke survivor, environmental concerns, personal care, recovery, and return to work.

Our community includes many nurses who have exceptional skills, deep knowledge, and the ability to impact the health of Delaware's residents and the health of residents in Delaware's

neighboring states. These nurses all have varying educational levels from Associate to Doctoral degrees, as well as various licensures: Licensed Practical Nurses, Registered Nurses, Advanced Practice Registered Nurses (Nurse Practitioners, Clinical Nurse Specialists, Nurse Anesthetists, Nurse Mid Wives). We want to thank all the nurses who commit their lives every day to improving the quality of life for all individuals.

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