An Acute Care Nurse Practitioner Model of Care for Stroke Patients

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Abstract

Stroke is the leading cause of adult disability and the fourth leading cause of death in the United States. Despite advances in research and technology there continues to be fragmentation of stroke care. The author proposed an acute care nurse practitioner (ACNP) model for stroke patients to improve outcomes at a regional medical center. A business plan and job description for an ACNP role as a stroke nurse practitioner (SNP) was developed.

Keywords: acute care nurse practitioner, stroke, stroke nurse practitioner
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Stroke is the leading cause of adult disability and the fourth leading cause of death in the United States (U.S.) (1-4). Approximately 795,000 Americans have a stroke each year; one occurring every 40 seconds and taking a life every four minutes (5). The mean expense per person for stroke care in the U.S. in 2009 was estimated at $6018 with a mean lifetime cost estimated at $140,048 (6). The estimated annual direct and indirect cost of stroke is $73.7 billion (7). The immediate care a stroke survivor receives can impact their hospital course and eventual discharge from the hospital. Among Medicare patients discharged from the hospital after a stroke, 45% return directly to home, 24% discharge to an inpatient rehabilitation facility and 31% discharge to a skilled nursing facility. Of stroke survivors returning directly home, 32% use home health services (8). Stroke not only physically affects a person, but also emotionally. Approximately one out of three stroke survivors experience post stroke depression (9). Depression can impact a stroke survivor’s willingness to participate in therapies, and ultimately, impact their disposition. If stroke survivors’ care is not coordinated in a multidisciplinary approach with the patient at the center of care, the patient’s outcome may be less than desired. Additionally it is imperative that caregivers are involved in the patient’s care to support the patient and to understand the plan of care.

Every minute a large vessel ischemic stroke is untreated, the average person loses 1.9 million neurons, 14 billion synapses and 12 km (7.5 miles) of axonal fibers. Each hour, in which treatment does not occur, the brain loses as many neurons as it does in almost 3.6 years of normal aging. With the introduction of intravenous tissue plasminogen activator (IV tPA) for acute ischemic stroke (IS), IS became a treatable neuroemergency. IV tPA must be given within 3 to 4.5 hours from the time of symptom onset for optimum results (10). Rapid diagnosis and treatment are crucial for reduction in morbidity, disability and stroke-related mortality (11).

This article outlines the author’s Doctor of Nursing Practice (DNP) scholarly project for a proposal to implement an acute care nurse practitioner (ACNP) model of care for stroke patients. The current model and proposed model will be discussed. The author will present current stroke outcomes data and goals for post implementation of the new model of stroke care at a regional medical center. The participatory, evidence-based, patient-focused process for
advanced practice nursing (PEPPA) framework was utilized as a guide to promote the development, implementation and evaluation of a SNP role.

**Background**

This proposal is for a 238-bed regional medical center that serves a 33-county area in the Midwest U.S. Since 2004, the facility has been certified by the Joint Commission as a Primary Stroke Center. Approximately 380 stroke and transient ischemic attack (TIA) patients are discharged annually. Even though the facility strives to meet and exceed stroke care outcomes, some areas have been identified to improve overall stroke care.

The American Heart Association (AHA) sets the standards for stroke care outcomes and promotes the utilization of Get-With-The-Guidelines-Stroke (GWTG-Stroke) program. GWTG-Stroke is a quality improvement program that facilities use to track their stroke measures, disseminate information to stroke team members and develop process improvement plans (12). An area of opportunity for the identified facility is the door-to-computed tomography (CT) and door-to-IV tPA times. In November 2011, a stroke alert process was implemented to facilitate a rapid response for potential stroke patients in the emergency room and to reduce door-to-CT and door-to-IV tPA times (Figure I). Post stroke alert implementation resulted in almost a 50% decrease in door-to-CT time; however, door-to-IV tPA time did not improve significantly. Stroke outcomes data, processes and current literature were reviewed. A suggestion was made to transport potential stroke patients from the ambulance directly to the CT scanner; however, there was resistance from emergency physicians requesting a hands-on examination of the patient prior to obtaining a CT scan. This step would add as much as an hour to the assessment and diagnosis. Additionally, some emergency providers believe a neurologist should see the patient prior to administering IV tPA. The utilization of an ACNP as a stroke nurse practitioner (SNP) was suggested as a way to streamline stroke care, improve patient outcomes and increase collaboration with nurses and providers. This set the stage for the proposal of an ACNP model of care for stroke patients.

**PEPPA Framework**

In order to develop a proposal for a SNP, the PEPPA framework was utilized as a guide to promote the development, implementation and evaluation of a SNP role. The PEPPA framework is a nine-step process
Define the Population and Describe the Current Model of Care

The first step is to define the population and describe the current model of care. The population is defined as all patients 18 years of age or older that present with stroke-like or TIA symptoms in the emergency department or inpatient area. Emergency physicians initially evaluate the patients, place orders for a CT scan and then determine if a patient is a candidate for IV tPA. For stroke patients that are ineligible for IV tPA, a neurologist may not be consulted in the emergency department or inpatient setting. A neurology consult is ordered at the discretion of the emergency or attending physician. Stroke order sets based on clinical practice guidelines are available in the electronic medical record and most providers utilize the order sets. Once a stroke or TIA patient is neurologically stable and the stroke work-up is complete, neurology may sign off the case prior to discharge.

Currently stroke and TIA patients are followed by the stroke program manager (SPM) who is a registered nurse. The SPM coordinates care, educates patients and families on stroke and ensures compliance with stroke outcome measures. The SPM is only consulted on stroke patients in the emergency department that are paged as a ‘Stroke Alert’ for potential IV tPA administration. A consult is placed for the SPM to see strokes or TIAs after patients are admitted to the hospital. Some gaps in the delivery of stroke care have been identified such as: inconsistent care when neurology is not consulted or signs off prior to a patient’s discharge, incomplete work up, increased length of stay and lack of appropriate discharge follow up. These gaps may be addressed with the proposed new model of care and implementation of the SNP role.

Identify Stakeholders and Recruit Participants

In the second step, the key stakeholders are identified and recruited. The author collaborated initially and throughout the development of the SNP proposal with the following stakeholders: patients, families, providers, nursing staff, the stroke team, human resources, finance, quality department, and emergency medical service (EMS).

Determine the Need for a New Model of Care and Identify Priority Areas

After recruiting the stakeholders, the need for a new model of care and identification of priority areas were discussed. Some priority areas to resolve are the door-to-CT and door-to-IV tPA times, coordination of care in the
emergency department and inpatient areas, and collaboration among EMS, nursing and medical staff. The need to improve nursing and provider documentation and the utilization of stroke order sets was also identified. Lastly, patient safety and quality outcomes were identified as priority areas (Figures II and III).

Define the Stroke Nurse Practitioner Role

After the priority areas were identified, the new model of care and SNP role were defined. The new model of care includes the development and implementation of a SNP role. The SPM, Medical Director of the Stroke Center and Human Resources developed, reviewed and approved the job description for the SNP. The job description allows the SNP to practice to the fullest level of preparation with the collaboration of physicians, providers, nursing staff, therapists and multidisciplinary team. Refer to Table I for the responsibilities and duties of the SNP. The minimum requirements are a Master of Science in Nursing or a Doctor of Nursing Practice degree, certification as an ACNP with a minimum of one year of experience preferred. The expectation is the SNP will complete the Neurovascular Education and Training in Stroke Management and Acute Reperfusion Therapy for Advanced Practice Nurse (NET SMART-APN) program within two years of employment. The NETSMART-APN fellowship program consists of 13 online modules and a preceptorship completed at a comprehensive stroke center. The program’s aim is to increase the number of advanced practice providers prepared to administer thrombolytics to decrease disability and death due to acute stroke (14). The Medical Director of the Stroke Center, a board certified neurologist, will be the sponsoring physician for the SNP. The scope of practice for the SNP will be governed by the State Board of Nursing and the certifying accreditation body.

Define the New Model of Stroke Care

The new model of care will require that the SNP is consulted on all potential stroke and TIA patients in the emergency department. The SNP will collaborate with nurses, emergency physicians and neurologists to coordinate care, expedite assessment for IV tPA treatment and provide patient-centered care. The services provided by the SNP will continue outside the emergency department and expand to the critical care, stroke, neurology and acute inpatient rehabilitation units. The SNP will be an integral part of the multidisciplinary team and actively participate in discharge planning and medication reconciliation for stroke and TIA patients to reduce patient length of stay and improve patient and nursing staff satisfaction. The outcomes (Figures I, II, III) will be tracked and shared with the
Senior Leadership Team, Chief Medical Officer, Medical Director of the Stroke Center, and the Quality Board. The SNP will facilitate education for nursing staff and providers, EMS and the public.

Plan Implementation Strategies and Implement Stroke Nurse Practitioner Role

The new model of care and SNP role were presented to the Nursing Administrative Council and Senior Leadership Team and approved. Initiation of the new program will include education to nursing staff, physicians, neurologists, the public and patients and families. Employment of the marketing department is necessary to publicize the new model of stroke care and the new role of the SNP. The current SPM will be transitioned to the role of the SNP upon passing the ANCC national certification exam and licensure as an ACNP. The SNP will complete orientation and the NET SMART-APN fellowship program. The increase in salary for transitioning the SPM to SNP will be an additional $15000 per year or $1250 more per month. The NET SMART-APN fellowship program will be a one-time investment of approximately $8000. The additional costs for credentialing a SNP will be captured by the projected decrease in LOS, improved patient and staff satisfaction. There is an opportunity to decrease the LOS by 0.25 patient days for stroke and TIA based on financial reports. The reduction of LOS equates to a potential cost savings of $19,000 per year. The SNP will provide patient-centered care, daily rounds, and be available to nursing and providers throughout the day. Having a dedicated NP will impact patient and nursing staff satisfaction which in turn improves the organization’s overall bottom line. Some of the services provided by the SNP will be billable, and therefore, will generate some revenue. The SNP may bill for services when neurology is not on the case or for counseling or an intervention.

The second phase of the new stroke care model will include the development and implementation of an outpatient stroke clinic by the SNP. Stroke and TIA patients will be scheduled a 7 to 10-day follow up appointment from discharge with the SNP to review tests, risk factors for stroke and medication compliance. The SNP will communicate with primary care providers (PCPs) on the patient’s hospital course and anticipated plan of care. The SNP will inform the PCP if any labs or tests are pending, or if the patient needs any recommended follow up. If a patient is discharged to an inpatient rehabilitation facility or a skilled nursing facility, the SNP will follow up with the patient, caregiver and facility.
Evaluation Plan for New Stroke Care Model and Stroke Nurse Practitioner Role

The evaluation plan of the new model of care and the SNP role will consist of a self-assessment by the SNP, review of the program and finances by the Senior Leadership Team, and an analysis of the stroke outcome goals set forth by the program. Refer to Figures I, II and III. The evaluation plan for the implementation of the SNP role includes periodic and annual reviews. Outcome data will be tracked on door-to-CT and door-to-IV t-PA times, LOS for TIA and stroke patients, patient and nursing staff satisfaction scores and shared on a quarterly basis. In addition, the Medical Director of the Stroke Center and the Director of Inpatient Services will review the strategic plan and goals, stroke outcome data and fiscal responsibilities and resources with the SNP and determine if any changes need to be implemented.

Implications for Nurse Executives

As organizations continue to focus on patient outcomes and financial stewardship it will be important for nurse executives to recruit and retain talent within their organization. Some organizations offer tuition assistance for nurses to pursue baccalaureate and advanced nursing degrees. While this is a great way to encourage nurses to return to the classroom, how do organizations challenge and promote these nurses to improve patient outcomes, staff and patient satisfaction? ACNPs can promote research and program development within an organization. Additionally, ACNPs can improve teamwork and collaboration within the nursing profession by educating and mentoring staff and facilitating leadership activities to encourage unit based activities.

Conclusion

There is limited research available on patient outcomes related to SNPs. Data from this project will provide baseline information on a SNP’s care and outcomes. The new model of care and the SNP role may be replicated at other organizations to improve stroke care and patient outcomes.
References


Diagram I: PEPPA Framework

1. Define Patient Population & Describe Model of Care
2. Identify Stakeholders & Recruit Participants
3. Determine Need for a New Model of Care
4. Identify Priority Problems & Goals to Improve Model of Care
5. Define New Model of Care & APN role
6. Plan Implementation
7. Initiate Role Implementation Plan
8. Evaluate APN Role & Model of care
9. Determine future needs

Role of Nursing Profession & APN Community

Initiate Role Development & Implementation | Begin Role Development & Implementation | Develop APN Role Policies & Protocols | Provide Education, Resources & Support
Figure I: Door-to-CT and Door-to-IV t-PA Times and Goals

<table>
<thead>
<tr>
<th></th>
<th>Door-to-CT Time (Minutes)</th>
<th>Door-to-IV t-PA Time (Minutes)</th>
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<tbody>
<tr>
<td>AHA Guidelines</td>
<td>( \leq 25 )</td>
<td>( \leq 60 )</td>
</tr>
<tr>
<td>CY 2011</td>
<td>61</td>
<td>80</td>
</tr>
<tr>
<td>CY 2012</td>
<td>33</td>
<td>75</td>
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<tr>
<td>Year 1 Goal</td>
<td>25</td>
<td>56</td>
</tr>
<tr>
<td>Year 2 Goal</td>
<td>17</td>
<td>38</td>
</tr>
</tbody>
</table>
Figure II: Patient and Nursing Staff Satisfaction Scores and Goals

<table>
<thead>
<tr>
<th></th>
<th>Patient Satisfaction: Would you recommend this hospital?</th>
<th>Nursing Satisfaction: Nursing Foundations for Quality of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>CY 2012</td>
<td>72.4 (4th Quarter)</td>
<td>2.90</td>
</tr>
<tr>
<td>Year 1 Goal</td>
<td>77.4</td>
<td>3.11</td>
</tr>
<tr>
<td>Year 2 Goal</td>
<td>82.4</td>
<td>3.25</td>
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Figure III: Patient Length of Stay (LOS) and Goal

<table>
<thead>
<tr>
<th></th>
<th>LOS for TIA Patients</th>
<th>LOS for Ischemic Stroke Patients</th>
<th>LOS for Hemorrhagic Stroke Patients</th>
</tr>
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<tr>
<td>CY 2012</td>
<td>2.340</td>
<td>3.596</td>
<td>5.679</td>
</tr>
<tr>
<td>Goal</td>
<td>2.09</td>
<td>3.346</td>
<td>5.429</td>
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Table I: Stroke Nurse Practitioner Duties and Responsibilities

<table>
<thead>
<tr>
<th>Responsible for:</th>
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<tbody>
<tr>
<td>Responds to Stroke Alerts in the emergency department and Rapid Responses/Codes throughout the hospital involving stroke patients.</td>
</tr>
<tr>
<td>Participates in immediate evaluation, initiation of stroke protocol, consideration and administration of intravenous thrombolytics and coordination of care for seamless delivery of stroke care.</td>
</tr>
<tr>
<td>Serves as a care coordinator and as an advocate for patients and families affected by stroke.</td>
</tr>
<tr>
<td>Reviews, develops and implements clinical practice guidelines related to acute stroke care. Educates nursing staff and providers as necessary.</td>
</tr>
<tr>
<td>Monitors and audits patients’ care and medical records for compliance of the Centers for Medicare and Medicaid Services (CMS) regulations and Stroke Measures for the Joint Commission and the American Heart Association Get-With-The-Guidelines Stroke (GWTG-Stroke) database. Develops process improvement plan(s) as necessary.</td>
</tr>
<tr>
<td>Accountable for leading the Comprehensive Stroke Committee meetings quarterly and as necessary. Periodic updates to the Stroke Center Medical Director, providers, quality board, and committee members.</td>
</tr>
<tr>
<td>Participates in the certification process for Joint Commission Disease Specific Primary Stroke Center. Maintains documentation and compliance of regulations and quality measures.</td>
</tr>
<tr>
<td>Develops, implements and completes an annual review of stroke policies and procedures, order sets and protocols.</td>
</tr>
<tr>
<td>Participates in the development of patient, staff, EMS and public education programs related to stroke care.</td>
</tr>
</tbody>
</table>