

**NATIONAL INSTITUTES OF HEALTH STROKE SCALE CERTIFICATION
IMPROVED ASSESSMENT AND CARE OF VETERANS—A QUALITY
IMPROVEMENT PROJECT**

by

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Abstract

This pilot project sought to fill the gap in practice that included a lack of early recognition, assessment skills and practice guidelines for the care of stroke patients, improving patient care and hand off communication. A team was formed at an 11-unit Veterans Health Administration facility. The team comprised various nursing disciplines whom were invited to discuss the current state of veteran care, and current evidence based practices of stroke recognition and care. Pre- and post- intervention tests were administered and data was collected to measure the assessment, recognition, and comfort level of registered nurses (RNs). Data revealed nine out of ten RNs showed an improvement in recognition and assessment skills, as well as comfort level when using the assessment tool. The project implies certification can positively affect the comfort level and assessment skills of nurses. The recommendation of the project leader is to expand the intervention to a wider discipline of nurses for improved care of veterans.

Keywords: assessment, comfort, National Institutes of Health, National Institutes of Health Stroke Scale tool, nurse, recognition, Registered Nurse, stroke, veteran, Veterans Health Administration

National Institutes of Health Stroke Scale Certification Improved Assessment and Care of
Veterans—A Quality Improvement Project

Introduction

Approximately 87% of strokes are ischemic in nature, thus making the patient eligible to receive life-saving medication known as tissue plasminogen activator (tPA) (Grif-Alspach, 2013). Given that tPA must be administered within 180 minutes of stroke symptom onset, time is important in the recognition and transfer of patients to identified stroke centers. Early identification of stroke-like symptoms by nursing personnel is critical for improving the outcome and potentially saving the patient's life. Grif-Alspach (2013) identified that the highest risk factor for stroke is hypertension, followed by atrial fibrillation (A-Fib) and nicotine abuse.

A large percentage of patients at the selected facility have been diagnosed with hypertension and/or A-Fib and are active daily nicotine users, thus placing the veterans at this facility at a high risk for stroke. Intervention strategies aimed at high-risk groups are more effective in treatment outcomes than non-target intervention strategies; therefore, those caring for patients identified with high-risk factors should be prepared with intervention strategies (Hassmiller-Lich et al., 2014). Patients who receive a baseline or pre-stroke-center assessment score, which is based on the National Institutes of Health Stroke Scale (NIHSS) scoring guide, have been shown to improve overall outcomes when the score is calculated correctly (Sucharew et al., 2013).

Grif-Alspach (2013) reported that the factors that most prohibit the administration of tPA are non-recognition of signs and symptoms of stroke and delay of treatment, which renders the patient ineligible for tPA administration. Grif-Alspach (2013) also reported that education

provided by direct patient care nurses could reduce the delay in recognizing signs and symptoms by the patient, as well as the delay in transporting the patient to a medical facility.

Patients who receive tPA within the 180-minute window are 30% more likely to have improved neurological recovery (Muchada et al., 2014). Tocco (2011) reported that all nurses in all disciplines of care should know how to recognize signs and symptoms of stroke and alert necessary teams. The NIHSS assessment is completed in the emergency department (ED) setting, where some facilities opt to utilize ongoing neurological assessments using abbreviated stroke scales, which can be time consuming on the nursing staff. Tocco (2011) pointed out that this is less favorable because of the risk of missing neurologic findings, specifically with patients with lower abbreviated scores.

Studies have found that early identification and assessment—specifically a neurological assessment with documentation—improves patient outcomes when they present with stroke-like symptoms. Although they did not specify which assessment tool should be used, the studies reported improved outcomes with early intervention on behalf of the patient (Arling et al., 2012). Although the age of the patient presenting with the onset of stroke-like symptoms has little bearing on patient outcomes, assessment and intervention on behalf of those presenting with stroke-like symptoms improves overall outcomes (Chumbler et al., 2012). The purpose of this paper is to describe a pilot project with urgent care nurses who gained certification through the National Institutes of Health (NIH) and utilized NIHSS assessment tool to care for Veterans presenting with stroke like symptoms.

Review of Literature

An electronic search of multiple digital databases was conducted. Identification of the pertinent literature led to hand searches of several articles and journals using Capella

University's library portal system and the Department of Veterans Affairs' intranet library portal. The search revealed 18 articles relevant to the project. Initial databases searched included Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline (PubMed), and Elton B. Stephens Company (EBSCO) Health. The Medical Subject Heading (MeSH) system was used to search keywords to retrieve evidence-based studies.

Keyword searches included *NIHSS use, veterans, stroke-like symptoms, NIHSS certification, NIHSS validity, stroke, stroke scale, and certification*. The search terms were then paired to search two-to-six-word phrases to narrow the search for application to the project. Phrase pairings included: NIHSS certification, NIHSS validity, NIHSS, and veteran care. A total of 123 articles were found using the search criteria. The selection of articles was further narrowed by article publication date to be no older than seven years old. Articles were selected based on their relevance to the DNP project, although one article was selected with an age of more than 10 years because of its similarity to the project. The articles were chosen specifically because of the commonality of the research and the implementation of the project, which specifically deals with the care of veterans with stroke-like symptoms and utilizing the NIHSS scoring and/or certification.

Literature on the care of patients at risk for stroke suggests that patient outcome is improved by early identification and treatment, proper documentation of Last Seen Normal (LSN) time, and assigning an NIHSS score (Hinkle, 2013). Identification of stroke-like symptoms is important in the early identification and treatment of stroke to prevent poor outcomes as a result of reduced blood flow to the brain. After initial identification of stroke-like symptoms, the LSN is obtained and recorded. To provide proper communication with the receiving stroke center, an NIHSS score should be assigned by a certified individual.

The only approved treatment of ischemic stroke with improved outcomes is to receive intravenous (IV) tPA (Muchada et al., 2014). Administration of tPA is dependent on stroke severity based on the NIHSS score and CT scan, patient age, past medical history, and documentation of the LSN time. Currently, the National Institute of Neurological Disorders and Stroke (NINDS) states that tPA should be withheld for patients with an NIHSS score of less than 5, as the NINDS tPA trial found there was no benefit (as cited in Muchada et al., 2014).

The NIHSS score plays a major role in the initial care of the patient receiving care, and it can have a significant effect on the patient's outcome on discharge. Zandieh et al. (2012) and Sucharew et al. (2013) reported that an NIHSS score assigned during prehospital (stroke center) care increases the basis of hospital care, and correctly assigned scores can improve overall patient outcomes. As a tool for measuring stroke severity, the NIHSS score (and certifying agency, the American Heart Association) has received multiple validations and has been deemed highly reliable as an assessment tool to guide the need for the administration of the neurological saving medication, tPA (Hinkle, 2013).

Theoretical Framework

The theoretical framework used in this project was Lippitt's change theory, which consists of seven phases that correspond to the phases of the nursing process (as cited in Mitchell, 2013). Lippitt's seven phases include diagnose, assess motivation/capacity for change, assess resources, select objective, choose roles and implement change, maintain change, and terminate the helping relationship (as cited in Mitchell, 2013).

Method

This project focused on the gap in practice and the lack of guidelines when recognizing, assessing, and caring for veterans with stroke-like symptoms. Prior to the intervention, the

facility had limited policies in place for nurses in regard to recognition, assessment, and care of veterans presenting with stroke-like symptoms. Further, there were no guidelines for registered nurses (RNs) who transported veterans for hand-off communication to ED staff at the receiving facility.

A professional team was developed to assess the need for the implementation of the NIHSS assessment tool. Once the team members were identified, a survey was distributed to urgent care RNs to assess their level of comfort for the care of veterans presenting with stroke-like symptoms, use of the NIHSS assessment tool, and RN hand-off communication—specifically when communicating regarding the NIHSS score. Once the survey was conducted, the identified participants received training in the use of the NIHSS assessment tool, were provided with the assessment tool, and were directed to the online certification resource, trainingcampus.net. Participants were given a time frame of 14 calendar days to complete the online certification process.

A deadline was established to have all participants certified and utilizing the assessment tool when caring for veterans presenting with stroke-like symptoms. Once certification was completed by all 10 participants, the use of the assessment tool was mandatory, and hand-off communication with the receiving facility RN included the NIHSS score. RNs were monitored by members of the professional team for compliance with the new policy guidelines.

A survey was delivered 60 days after the established deadline date to assess the RNs' level of comfort in recognizing, assessing, and caring for veterans presenting with stroke-like symptoms, Appendix A. The survey was identical to the pre-intervention survey and ascertained the RNs' self-assessment of their skills associated with using the NIHSS assessment tool. Further, a survey was delivered for RNs to self-identify their comfort level of recognition of

stroke-like symptoms, care of veterans presenting with stroke-like symptoms, and comfort level with using the NIHSS assessment tool.

Setting

The setting for this process improvement project took place at an 11-unit Department of Veterans Affairs healthcare facility. The Medical Center was within the Veterans Health Administration of the North East. The facility delivers care to approximately 75,000 veterans for primary care, geriatrics and extended care, and mental health services. It offers outpatient and inpatient services, including inpatient acute psychiatric care, gerontology psychiatric, substance abuse and treatment, posttraumatic stress disorder, homeless domiciliary programs, and 24-hour urgent care coverage.

Participants

The project began with the development of a professional team of varied nursing backgrounds to evaluate the need for the project and the implementation of the planned intervention. The team made recommendations for the project's implementation, time frames, and staff to be included in the educational intervention. The team consisted of nursing staff from administration, bedside nursing, and nursing education, a unit manager, an assistant unit manager, and a clinical nurse leader.

Members of the Medical Emergency Response Team (MERT), Nurse Practice Board (NPB), Nurse Executive Committee (NEC), and Medical Center Executive Committee (MCEC) were also consulted on the project's implementation and time frames. Approval was given prior to the project's implementation from the Director of Primary Care, Unit Manager, Assistant Unit Manager, MERT committee, NPB committee, NEC, and MCEC, respectively.

The inclusion criteria for the project participants included all RNs who currently work full-time in the urgent care unit, or who potentially cover the urgent care unit or as –needed unit coverage. This inclusion criterion was established by the DNP leader with approval from the professional team members. Ten RNs were identified using the inclusion criteria and were given the pre-/post-intervention surveys.

Each participating RN chose a unique identifier, with the same identifier being used on the pre/post intervention surveys. This provided anonymity for participants as well as confidentiality; identifiers were then matched for the pre/post survey and compared for data analysis. Surveys were kept in a locked drawer, in a locked room, where only the DNP learner had access to the drawer. Surveys were destroyed after all data had been verified and collected.

Data Collection

A pre-training survey (Appendix A) based on NIHSS assessment tool guidelines with permission from the National Institute of Neurological Disorders was distributed, measuring (a) baseline assessment skills for veterans presenting with stroke-like symptoms, (b) use of the NIHSS tool, (c) baseline care of veterans presenting with stroke-like symptoms, and (d) hand-off report to receiving RN at a certified stroke center. There were four questions related to the identification of stroke-like symptoms and NIH guidelines for stroke care to assess the RNs' pre-educational intervention knowledge base.

A meeting was held for RNs over the course of two days to encompass every nurse on day and night shift from differing schedules. The training was delivered to the nursing staff at this meeting using a didactic information and discussion period. The educational meetings were kept to a maximum of one hour to reduce exertion and overstimulation, and to minimize overtime, thereby avoiding budgetary constraints.

The educational intervention presentation was uploaded to the educational resource utilized by the facility, Talent Management System (TMS). The TMS is the resource used by all employees to conduct required training outlined by unit managers and the chief of nursing education. The NIHSS website for certification was uploaded to the TMS for participants to complete the certification requirement within a four-week time frame. A post-training survey, Appendix A, was then distributed to the RNs to measure changes in their knowledge and comfort level in recognizing a stroke 60 days after the project's implementation.

Data Analysis

The pre- and post-intervention surveys were delivered to the participants prior to the educational session and then 60 days after the intervention. Comparative data analysis was conducted to compare the pre-intervention answers to the post-intervention answers, along with a retrospective study of charts to determine the documentation of NIHSS scores on veterans presenting with stroke-like symptoms.

The comparative analysis of the pre- and post-intervention answers was conducted under anonymity to eliminate bias. Each participant selected a numerical identifier and was instructed to place the chosen identifier on their pretest. The participant used the same identifier on the post-test for comparison values, and the numerical identifiers were compared with the pre- and post-intervention answers.

Results

Intervention

This project consisted of a non-research-based pilot study in which the intervention for RNs included a change in current practice. The practice change was considered a quality improvement project and deemed to fit the criteria for a quality improvement project by the

Institutional Review Board (IRB) liaison from the facility. Therefore, it was not subject to oversight by the IRB from the facility. This decision was reviewed by the Capella University IRB, which concurred that the project was a quality improvement endeavor, and therefore exempt from Capella IRB review.

Discussion

The project participants included ten ($N = 10$) RNs comprising of seven women and three men. The participants' demographics are shown in Table 1. Scoring on the pre- and post-intervention surveys was conducted and compared (Table 2). A marked improvement was noted on questions 1, 2, 3, and 5, with percentage improvements of 78%, 20%, 56%, and 20% respectively. Question 4 revealed no improvement in knowledge of the assessment of the Level of Consciousness (LOC), with all participants selecting the correct answer.

Regarding the answers for RNs' reported level of comfort, Table 3 noted increased levels of comfort in all four areas of questioning: assessment, use of the NIHSS tool, care of veterans with stroke-like symptoms, and hand-off communication to gaining facility. The RNs reported their self-assessed comfort levels on a scale of 1 to 5, with 1 = *low level of comfort* and 5 = *high level of comfort*.

There was a noted improvement in the comfort level of assessment of veterans presenting with stroke-like symptoms, and an increase in the mean score of 0.9 for pre-intervention ($M = 3.3$) compared to post-intervention ($M = 4.2$). The RNs' comfort level increased when using the NIHSS assessment tool when comparing pre-intervention ($M = 2.6$) to post-intervention ($M = 3.5$). Overall care of veterans with stroke-like symptoms pre-intervention ($M = 3.5$) increased with certification post-intervention ($M = 4.3$). Lastly, the comfort level for

RNs increased when conducting hand-off communication to a higher level of care facility pre-intervention ($M = 3.5$) compared to post-intervention ($M = 4.5$).

After the 60-day pilot study, a retrospective chart review was conducted on all facility code blue encounters, with 75 charts identified as “code blue”. The chart reviewed the inclusion criterion for veterans with complaints of slurred speech, facial palsy, altered mental status, and gait disturbances coinciding with a “code blue”. The review revealed two veterans with stroke-like symptoms and a ‘code blue,’ which prompted assessment by the project participants. In Encounter A, the RN scored the veteran 7 using the NIHSS tool, and encounter B scored 15, which resulted in transport via a medical helicopter to a Level I trauma and stroke center.

Summary

The results of this project identified an increased level of comfort when assessing and caring for veterans presenting with stroke-like symptoms with NIHSS certification and use of the assessment tool. Although there were only two instances of NIHSS tool use, hand-off communication to the gaining facility was reportedly improved.

Limitations and Future Directions

A key assumption in this project was the honesty and reliability of the nursing administration to appropriately document the veterans presenting with stroke-like symptoms, and for staff to activate a code blue response. A retrospective chart review was conducted for 75 code blue encounters and identified only two encounters where veterans presented with stroke-like symptoms. An identified limitation was the nomenclature of the nursing administration’s documentation, in which veterans may have presented with stroke-like symptoms but no code blue was called on the veteran, or the nomenclature did not capture the identifying factors of stroke-like symptoms. For example, chart documentation may have identified encounters as a

hypertensive crisis, headache, or weakness, with no code blue activation for these encounters, therefore hindering the retrospective chart review of code blue encounters.

Conclusions

Despite the small sample size and the low number of identified presentations, the outcomes of this quality improvement project have been positive. Encouraging comments were made by the nursing staff regarding training that is applicable to their career and, more specifically, to improving the care of veterans. With increased foundational knowledge of the recognition and assessment skills of stroke-like symptoms, improved care and outcomes will be delivered to veterans. It is recommended to expand this project to include a larger pool of nursing staff and medical clinicians to meet the ever-increasing demands to deliver high-quality, veteran-centered care.

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Table 1

Participant Demographics

Age in Years	# of Participants
31–40	3 (37, 38, 39)
41–50	1 (44)
51–60	6 (54, 55, 55, 56, 57, 58)
Mean age in years: 49.3	
Years of Nursing Experience in Urgent Care	# of Participants
3–5	1 (5)
6–10	2 (8, 9)
11–15	2 (12, 14)
16–20	2 (18, 19)
21+	3 (25, 26, 29)
Mean years of nursing experience: 16.6	

Table 2

Intervention Survey

Question	Pre-Intervention		Post-Intervention		% Improvement
	Correct	Incorrect	Correct	Incorrect	
1: Motor Leg	2	8	9	1	78%
2: Facial Palsy	8	2	10	0	20%
3: Assessment	4	6	9	1	56%
4: LOC	10	0	10	0	0%
5: Baseline	8	2	10	0	20%

Table 3

Comfort Survey

Question	Pre-Intervention Mean	Post-Intervention Mean
A: Assessment	3.3	4.2
B: NIHSS tool use	2.6	3.7
C: Care	3.5	4.3
D: Hand-off communication	3.5	4.4

Appendix A

Answer the following questions regarding care of veterans with stroke-like symptoms. On a scale of 1–5, with 1 being low level of comfort and 5 being high level of comfort. Place an “X” in the box that corresponds with your self-assessment.

Answer the following questions based on the National Institutes of Health Stroke Scale scoring tool. Place an “X” in the box that corresponds with the best answer choice to the question.

Question	A	B	C	D
<p>1. To assess motor leg: the limb is to be placed in a ____ degree angle (testing supine), and the drift is scored if the leg falls before 5 seconds.</p> <p>A.) 45 B.) 30 C.) 90 D.) 15</p>				
<p>2. To assess facial palsy:</p> <p>A.) Have patient show teeth. B.) Have patient raise eyebrows & close eyes. C.) Score symmetry of grimace in response to noxious stimuli in the poorly responsive or non-comprehending patient. D.) All of the above.</p>				
<p>3. Patients are to receive an assessment score at (check all that apply):</p> <p>A.) Initial presentation B.) 2 hours C.) 24 hours +/- 20 minutes D.) 7–10 days</p>				
<p>4. To assess Level of Consciousness (LOC):</p> <p>A.) Assess alertness, orientation, and the ability to follow simple commands. B.) Assess if the patient can recite the Declaration of Independence. C.) Assess alertness, orientation, and the ability to follow difficult, complex commands. D.) Assess if the patient can count backward from 100 to 0.</p>				
<p>5. An initial baseline score is to be established:</p> <p>A.) Upon arrival to a facility with NIHSS certified personnel. B.) By estimating what the patient may have been at initial onset of stroke symptoms. C.) Not done if symptoms are greater than 2 hours old. D.) By asking the patient to complete a survey on how they feel.</p>				

QUESTION	1	2	3	4	5
A. What is your level of comfort with assessing a Veteran with stroke-like symptoms?					
B. What is your level of comfort utilizing the National Institutes of Health Stroke Scale scoring system?					
C. What is your level of comfort with care of the Veteran experiencing stroke-like symptoms?					
D. What is your level of comfort with hand-off communication to Brandywine Hospital ER staff for veterans with stroke-like symptoms?					

Appendix B. STATEMENT OF ORIGINAL WORK

Academic Honesty Policy

Capella University's Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

The following standards for original work and definition of *plagiarism* are discussed in the Policy:

Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)
Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else's ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University's Research Misconduct Policy (3.03.06) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy: Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.

Statement of Original Work and Signature

I have read, understood, and abided by Capella University's Academic Honesty Policy (3.01.01) and Research Misconduct Policy (3.03.06), including the Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the *APA Publication Manual*.

Learner name

and date

Joshua W. Baker, RN MSN 12/16/2016
