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# Emergency Department Nurses' Knowledge of Evidence-Based Ischemic Stroke Care

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I am a second-degree nursing student graduating in May 2011. I obtained a Bachelor of Arts in Integrative Physiology from the University of Colorado in 2008. Since beginning the nursing program at the University of Kentucky in spring 2009, I have served as a research intern working with nursing faculty member, Kate Moore.

I presented my work at the College of Nursing Scholarship Showcase in March 2011 and was awarded “Best Undergraduate Podium Presentation.” My research is also being related in a professional journal article and will be submitted to the *Journal of Emergency Nursing*.

As a dedicated student, I will be graduating with academic honors and was on the Dean’s List each semester I was a full-time student at the University of Kentucky. I am a member of the Delta Psi Chapter of Sigma Theta Tau, the Honor Society of Nursing, and a member of Phi Kappa Phi Honor Society. Upon graduating, I will be working as a bedside nurse with a special interest in critical care. I hope to pursue a doctoral degree after gaining experience as a registered nurse in the clinical setting.

#### Faculty Mentor: Dr. Kathryn Moore



Stroke is a major health problem in the United States Emergency Department (ED). Nurses are on the front lines of identifying a stroke when the patient presents to the ED and ensuring proper management in the first critical hours post injury. Current literature outlined in the paper describe a knowledge deficit on the part of ED nurses about stroke care and the current evidence-based practice guidelines for the

management of stroke. This paper examines the factors which may impact ED nurses knowledge of stroke management and how that might be implemented into practice.

Ms. Traynelis has worked many long and hard hours as part of the research team from the beginning of the project. She was involved from the IRB submission through the data analysis.

## **Introduction**

Almost 800,000 people will have a stroke this year in the United States (American Heart Association, 2010). There is one stroke every forty seconds and one stroke-related death every four minutes in the United States (American Heart Association, 2010). Because of the remarkable frequency of strokes, it is probable that a stroke will affect each one of us at some point in our lives, either directly or indirectly.

A stroke, also known as a brain attack, is a life-threatening condition that decreases oxygen delivery to the brain (National Stroke Association, 2010). Strokes can be ischemic or hemorrhagic in origin. An ischemic stroke occurs when a blood clot occludes blood flow in an artery in the brain resulting in decreased oxygen delivery to brain tissue. A hemorrhagic stroke occurs when a blood vessel ruptures in the brain resulting in decreased oxygen delivery to brain tissue (National Stroke Association, 2010). Decreased oxygen delivery to brain tissue may result in tissue ischemia and ultimately brain tissue death (National Stroke Association, 2010). Brain tissue death may result in long-term mild to severe functional and cognitive deficits. Almost 90% of strokes are ischemic (American Heart Association, 2010). This paper will focus on ischemic stroke.

Once an ischemic stroke has transpired in a patient, response time of both paramedics and emergency department (ED) nurses is paramount to minimize brain tissue death (Adams, et al., 2010). Paramedics and ED nurses must be able to recognize the presentation of an ischemic stroke and have knowledge of the appropriate intervention. The American Heart Association (AHA) has published recommended guidelines for the evaluation and treatment of an ischemic stroke (Adams, et al., 2010). Therefore, the evaluation and treatment of ischemic stroke should not have much variation state-to-state.

## **Literature Review**

A review of the literature found one study pertaining to nurses' knowledge of ischemic stroke care. An investigator administered a multiple-choice test to emergency department (ED) nurses (N = 20) (Harper, 2007). The research found a significant knowledge deficiency of evidence-based ischemic stroke care in ED nurses, as nurses correctly answered a mean average of 53% of questions on evidence-based ischemic stroke care (Harper, 2007).

Previous research has demonstrated a knowledge deficit of evidence-based ischemic stroke care in ED nurses. No study was found that assessed knowledge of the ED nurses on a national scale. No study was found that focused solely on primary-stroke care centers. It may be important that further research is conducted to determine the current knowledge level of evidence-based ischemic stroke in ED nurses. Identifying insufficient knowledge may foster an opportunity for the continuing education of ED nurses. Educating will facilitate more efficient and more accurate recognition of an ischemic stroke and evidence-based care of patients suffering from an ischemic stroke. The result of increased recognition and treatment will be greater patient outcomes. Our research sought to fill this void and offer a richer understanding of ED nurses' knowledge of evidence-based ischemic stroke care on a national level.

## **Purpose**

The purpose of the overall study was to assess pre-hospital and emergency department registered nurses' and paramedics' knowledge of evidence-based ischemic stroke care. The research questions of investigation are: What is the knowledge base of pre-hospital and emergency department registered nurses and paramedics of evidence-based ischemic stroke care? What are the levels of knowledge among different demographic groups of registered nurses? This paper will focus exclusively on the latter research question. This paper will discuss which cohort performed the best on the multiple-choice test, therefore being the most knowledgeable evidence-based ischemic stroke-nurse.

## **Methods**

An IRB-approved cross-sectional, descriptive study was conducted. This study was based on the Harper study (2007). Letters of inquiry were sent to ED managers obtained from the National Association of Emergency Medical Services and the Emergency Nurses Association. A total of 500 ED requests and 500 pre-hospital requests were mailed; approximately 250 ED request letters and 300 pre-hospital letters were returned to sender as "undeliverable." The letters of inquiry requested the institutions invite ED nurses and paramedics to participate in the study. Completion of the survey was considered consent to participate. With permission from the pilot study investigator, a ten question multiple-choice quiz was administered via Survey Monkey. The ten questions remained unchanged from the pilot study. The participants were asked to complete the survey without resources or help from colleagues. Prior to answering the multiple-choice questions, the participants related demographic information including: age; gender; education; certification; and years in profession. There was no exclusion of participants based on any demographic factors. Participants were not asked for identifying information, including the facility for which they work. Participants and their facilities were not given quiz results or scores.

Descriptive analysis was done to describe the sample. T-tests were performed to assess the differences between the various groups. The quiz was analyzed using percentages of correct answers.

**Results**

The study sample consisted of 63 voluntary respondents including 53 registered nurses and 7 paramedics. Participants represented various educational levels. The average number of ischemic stroke patients participants cared for in the past month was 4.7 patients.

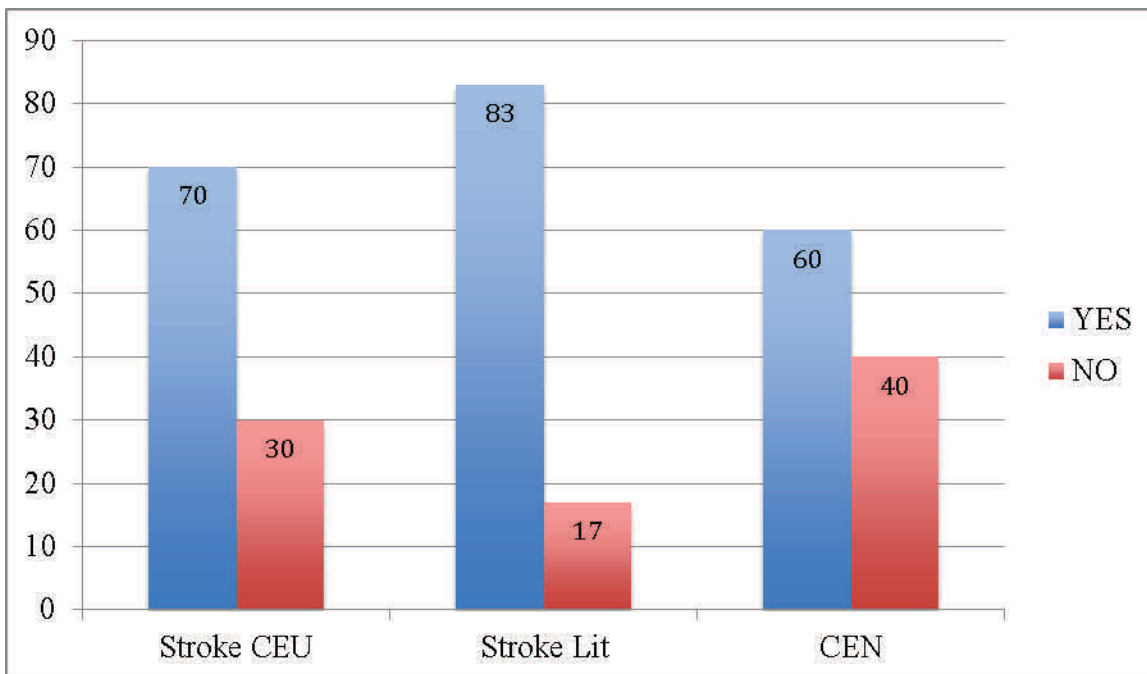
EDUCATIONAL LEVEL	NUMBER RESPONDENTS
Master’s	18
Bachelor’s	29
Associate	13
Diploma	2

**Figure one:** Highest degrees obtained by participants.

Overall results found that test scores ranged from 10% to 90% correctly answered on a 0-100% grading scale. There was a mean average of 58% (SD 17.0) on a scale of 0-100%.

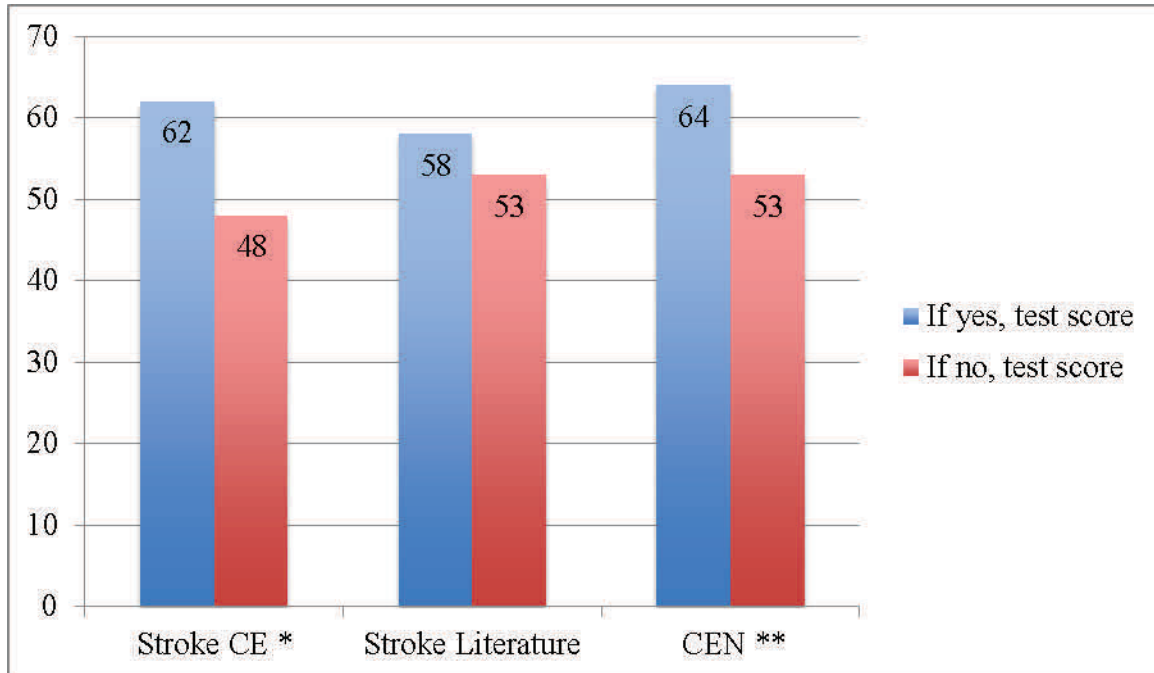
The results can be broken down by the aforementioned demographics. Of the nursing participants, 83% stated that they had read ischemic stroke-related literature within the past twelve months. This cohort did not have significantly higher mean scores when compared to participants who had not read ischemic stroke-related literature in the past twelve months. Of the nursing participants, 70% stated that they have completed evidence-based ischemic stroke continuing education models. This cohort did have a significantly higher mean score (p=0.003) when compared to participants who have not completed evidence-based ischemic stroke continuing education models. Of the nursing participants, 43% stated that they were certified emergency nurses (CEN). This cohort did have significantly higher mean scores compared to participants without CEN accreditation (p<0.01).

**Demographical Findings**



**Figure two:** Percentage of respondents who answered YES to participating in stroke-specific continuing education unit (Stroke CE); stroke literature; and certified emergency nurse (CEN) status compared to those answering NO.

Comparison of Test Scores in % Correct



**Figure three:** Those participating in a Stroke CE within the past year scored significantly higher ( $p < 0.02$ ) than those who did not participate in a stroke CE. Those with CEN status scored significantly higher ( $p < 0.05$ ) than those who are not a CEN. Stroke literature had no significant effect on quiz scores.

**Discussion**

Overall, our study found that participants had unsatisfactory scores on the evidence-based ischemic stroke care quiz and there was an overall knowledge deficit of ischemic stroke care guidelines. In fact, the mean score of 58% answered correctly would be considered failing in any American classroom setting today. This finding mirrored the study by Harper (2007).

When scores were separated into certain demographic cohorts, emergency department nurses are most knowledgeable about evidence-based ischemic stroke recognition and care when they have participated in stroke specific continuing education units (CEUs) when compared to simply reading the literature on stroke. This may be due to the fact that CEUs require participants to complete an activity at the end of the unit. Participants may knowingly or unknowingly pay closer attention to the presented material in a CEU than in a literature article. CEUs may be more beneficial to reinforce treatment protocols. While reading literature did not significantly improve quiz scores, it is still recommended that nurses read current literature to stay up-to-date with novel findings. Additionally, emergency department nurses who have achieved certified emergency nurse (CEN) status demonstrated a greater knowledge level of ischemic stroke guidelines. It is interesting to note that obtaining CEN status requires a stroke-specific CEU. Of our sample, the nursing participants most knowledgeable about evidence-based ischemic stroke care are the emergency department nurses who are both certified emergency nurses and participate in stroke-specific continuing education units. While these cohorts did perform better than their counter-parts, their overall mean score was still low.

There were notable limitations to this study including a small sample size and the fact that it could not be ensured that participants did not use resources or discuss topics with colleagues during the quiz.

**Conclusion**

It could be suggested that stroke specific continuing education units become recommended or even mandatory for nurses in the emergency department, especially those emergency departments receiving a high volume of ischemic stroke patients. It could also be suggested that managers require or prefer a certified emergency nurse status for their employees.

This study was an extension of the study by Harper (2007) and can serve as a stepping stone for future research. It may be important that more research be conducted with a larger sample size. It may be beneficial to implement a more valid quiz with an appropriate passing score in future research; the quiz could be dispersed to experts in the field for review and a criterion score could be determined. It may be interesting to assess the knowledge of evidence-based ischemic stroke care of registered nurses working in primary stroke care centers, as these healthcare providers likely see a large volume of stroke patients on a monthly basis. It may be beneficial to compare the knowledge of registered nurses working in urban, suburban and rural hospitals because patients with having a stroke will be taken to the nearest facility. Regardless of how the next steps unfold, it is important that future research continues to evaluate nurses' knowledge of evidence-based ischemic stroke care.

### Acknowledgements

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### Appendix

A patient presenting to triage with an ischemic stroke may likely exhibit which of the following symptoms?

- a. Disorientation, photophobia, headache
- b. Unilateral arm/leg weakness, droopy or asymmetrical face, difficulty speaking**
- c. Seizure, dizziness, vomiting
- d. Decreased level of consciousness, left leg weakness, right arm weakness

It is recommended that treatment with intravenous tPA begin within how many hours of stroke symptom onset?

- a. 3 h**
- b. 6 h
- c. 9 h
- d. 12

Which of the following is the recommended door-to-drug time for administration of tPA for ischemic stroke?

- a. 30 min
- b. 60 min**
- c. 90 min
- d. 120 min

Prior to administering intravenous tPA for ischemic stroke, labetalol is recommended for lowering the blood pressure to which of the following levels?

- a. Less than 185/110**
- b. Less than 200/115
- c. Less than 215/120
- d. Less than 230/125

Which of the following is the recommended dosage of tPA for patients who have had an ischemic stroke?

- a. 0.3 mg/kg

- b. 0.5 mg/kg
- c. 0.7 mg/kg
- d. 0.9 mg/kg**

An ischemic stroke patient's neurologic status and vital signs should be assessed frequently for how long after tPA administration?

- a. 12 h
- b. 24 h**
- c. 36 h
- d. 48 h

Which of the following types of intravenous fluid is recommended for patients with ischemic stroke?

- a. D<sub>5</sub>W
- b. 0.9% Normal saline solution**
- c. D<sub>5</sub>NSS
- d. Lactated Ringer's

Which of the following temperatures should be treated in a patient with ischemic stroke?

- a. 99°F**
- b. 100°F
- c. 101°F
- d. 102°F

Which of the following medications is recommended within 24-48 hours of ischemic stroke onset?

- a. Heparin
- b. Aspirin**
- c. Plavix
- d. Aggrenox

For patients with ischemic stroke not treated with tPA, it is recommended that the blood pressure be treated if it exceeds which of the following levels?

- a. 165/105
- b. 185/110
- c. 200/115
- d. 220/120**

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