



Does Comprehensive Stroke Center Recommended Nurse Training Result in Earlier In-hospital Stroke Recognition



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Introduction

- Early recognition of acute ischemic stroke (AIS) symptoms leads to better revascularization outcomes.
- Intuitively: In-hospital stroke onset has potential for more rapid assessment and treatment as there are readily available medical staff present at onset.
- Reality: Patients are in bed and not routinely neurologically assessed, staff may be unaware of stroke symptoms
- What can we do?
- Educate medical personnel in order to increase alertness of stroke symptoms and improve their recognition
- Improve process for inpatient stroke alerts in order to avoid unnecessary delays in getting head CT, labs, IV tPA and intervention.
- The Joint Commission requirement for CSC:
- 8 hours of annual stroke education for nurses who take care of stroke patients (ED, ICU, Stroke unit...)
- 2 hours of annual stroke education for other staff (5).

Hypothesis

- The hypothesis of this study is that nurses with the CSC-recommended stroke education are better at recognition and action in patients with acute stroke than nurses without required 8 hour training:
- Activate stroke alert more quickly
- Activate stroke alert for appropriate symptoms
- Transfer patients to head CT
- Quicker administration of IV tPA

Design and method

- In-hospital, non-emergency room "Stroke Alerts" were retrospectively reviewed for the five-year period of January 2013 to December 2017.
- Data source:
- Admission history and physical
- Neurology consult note
- Neurology interim stroke alert note
- Discharge summary
- All data were checked for accuracy by two separate collectors
- Comparison of units staffed by CSC trained nurses and standard training nurses - data analysis with t-test and chi-square
- OUMC Plan for CSC compliant stroke educations:
- Stroke Nurses attend Advanced Stroke Life Support class and online courses (6).
- Non-Stroke Nurses online course only
- We compared mean time for initiating SA since last known normal, time to CT, and final diagnosis for the SA between CSC trained staff and non-CSC trained staff.

Results

Figure 1. Percent of Stroke Alerts paged by hours 1-8 (one nurse shift)

- There is no difference in number of stroke alerts paged by our no matter what stroke education nurse received

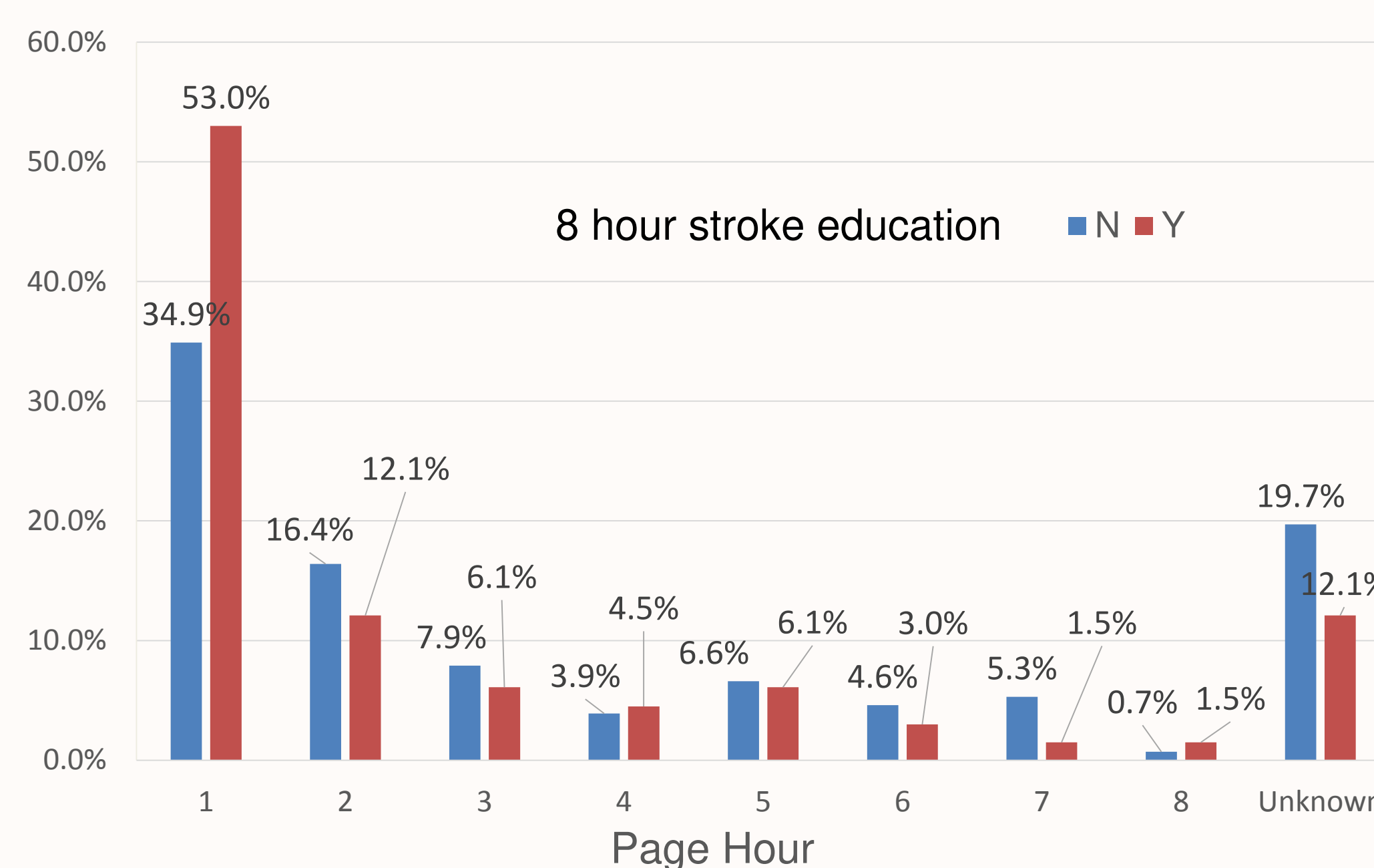


Figure 2. Stroke Alert paged during first hour vs. all other hours

- Nurses who received 8 hour stroke education could recognize stroke and page Stroke Alert during first hour after symptom onset significantly better
- This effect continued even after all patients who had neurochecks ordered were eliminated

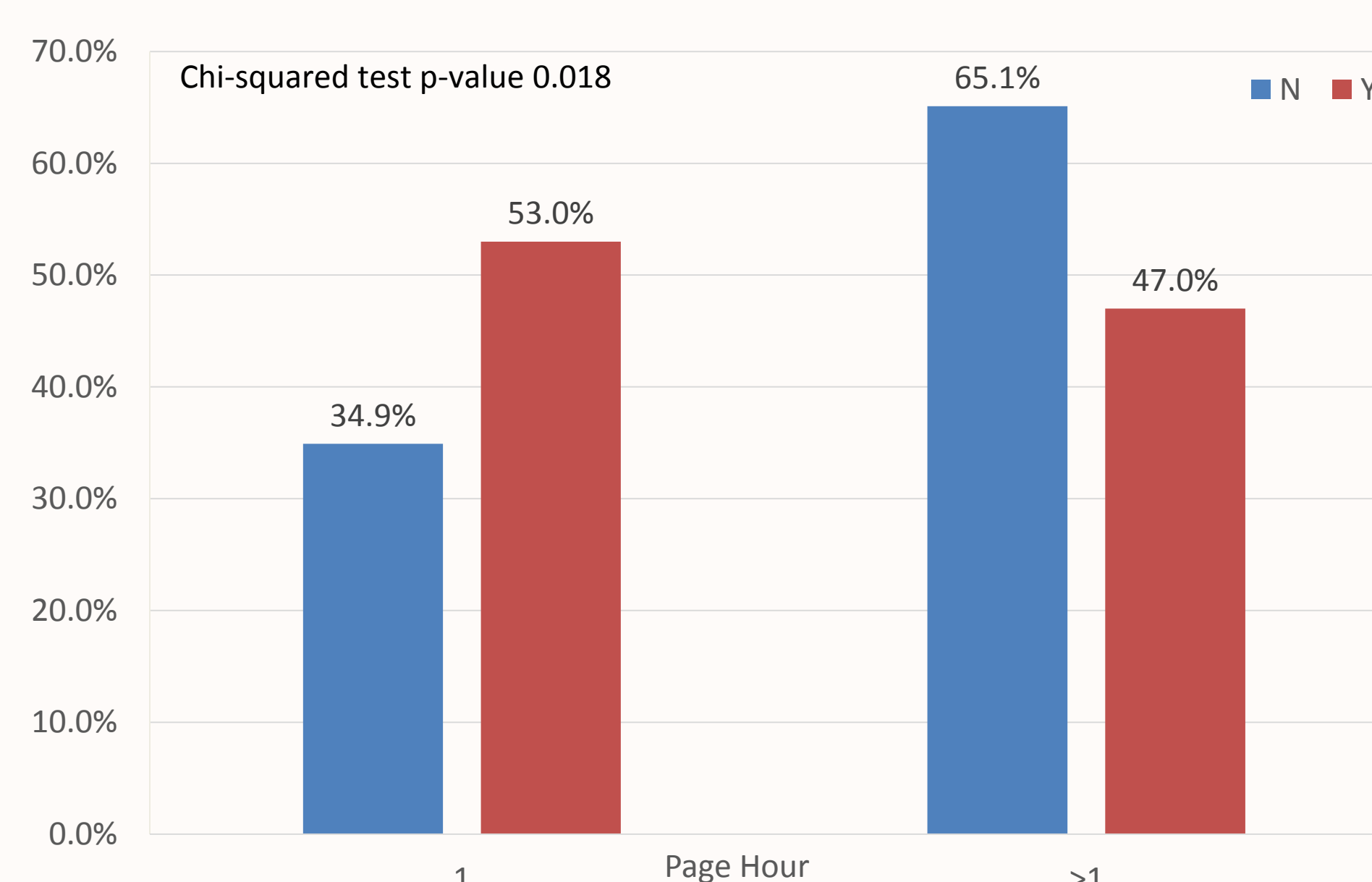


Table 1. Nurses who had 8 hours of stroke education significantly more commonly paged Stroke Alert (SA) for "real stroke" than for stroke mimic p=0.029

Page Hour	8 hour CSC Training			Regular 2 hour training		
	All SA	Real strk	Real stk%	All SA	Real strk	Rea stk%
1	53	17	32.0%	35	16	84.0%
2	25	4	16.0%	8	2	33.0%
3	12	8	66.0%	4	2	50.0%
4	6	1	16.0%	3	0	0.0%
5	10	3	30.0%	4	3	75.0%
6	7	2	28.0%	2	0	0.0%
7	8	4	50.0%	1	0	0.0%
8	1	1	100.0%	1	1	100.0%
Unknown	30	12	40.0%	8	4	50.0%

Results

Table 2. General characteristics of all inpatient stroke alerts

General Characteristics	Overall (n=218)
Age	62 (± 15)
Gender (Female)	108 (49.5%)
NIHSS	10 (± 8.5)
Neurochecks ordered	28 (12.8%)
Days.since.admit	6.0 (± 12)
Nurses who had required CSC Training	66 (30.3%)
Page Hour	
1	88 (40.4%)
2	33 (15.1%)
3	16 (7.3%)
4	9 (4.1%)
5	14 (6.4%)
6	9 (4.1%)
7	9 (4.1%)
8	2 (0.9%)
Unknown Time of Onset	38 (17.4%)
Admitting service/category	
Cardiac	31 (14.2%)
Endocrine	1 (0.5%)
GI	12 (5.5%)
Hematologic	1 (0.5%)
ID	38 (17.4%)
Neoplastic	36 (16.5%)
Nephrologic	12 (5.5%)
Neuro	52 (23.9%)
OBGYN	4 (1.8%)
Pulmonary	5 (2.3%)
Trauma	26 (11.9%)
Risk Factors	
DM	76 (34.9%)
HTN	151 (69.3%)
CAD	62 (28.4%)
Afib	38 (17.4%)
Dyslipidemia	92 (42.2%)
Smoking	56 (25.7%)
Prior.stroke	52 (23.9%)
mRS	
0	58 (26.6%)
1	44 (20.2%)
2	31 (14.2%)
3	19 (8.7%)
4	24 (11.0%)
5	18 (8.3%)
Missing	24 (11.0%)
Type of Stroke	
ICH	8 (3.7%)
Ischemic	72 (33.0%)
Stroke mimic	138 (63.3%)

Conclusion

- Nurses who had CSC required 8 hour stroke education quicker recognized stroke symptoms and paged stroke alerts during first hour.
- This effect continued to stay even when all patients who had ordered neurochecks were eliminated from the analysis.
- Nurses who had CSC required 8 hour stroke education more commonly called Stroke Alert for patients who were later diagnosed with ischemic or hemorrhagic stroke, even though nurses who had regular stroke education more commonly call stroke mimics
- Expanding the CSC training to all staff would benefit hospital-wide stroke alerts. More data is needed to confirm this.

References

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