

Executive Summary

Stroke Thrombolytic Timing in the Emergency Department

April M. Stevenson

College of Nursing, East Carolina University

Doctor of Nursing Practice

Executive Summary

Key Findings

- Door-to-needle (DTN) performance improved by 13 percentage points (27% to 40%) and computed tomography-to-needle (CTN) performance improved by four percentage points (26% to 30%) reflecting enhanced efficiency throughout the stroke treatment process.
- An interdisciplinary quality improvement approach strengthened collaboration amongst emergency medicine, emergency nursing, radiology, pharmacy and neurology team.
- Standardized stroke workflow improvements through iterative plan-do-study-act (PDSA) cycles reduced process variation and enhanced the consistency of stroke care delivery.
- Leadership and key stakeholder engagement and routine performance monitoring with continuous feedback supported successful implementation and sustainability of practice changes.
- Earlier thrombolytic treatment has the potential to improve neurological outcomes, functional mobility and quality of life for eligible patients diagnosed with acute ischemic stroke (AIS).
- This project demonstrated that evidence-based performance improvement has the potential to enhance stroke care timeliness and throughput and may be replicated in similar emergency department settings.

Background & Purpose

Acute ischemic stroke is one of the leading causes of disability & morbidity in the United States (US). Administration of IV thrombolytic therapy in a timely manner improves neurological outcomes and reduces disability. American Heart Association (AHA) and

Executive Summary

American Stroke Association (ASA) guidelines advocate for rapid treatment, recommending $CTN \leq 25$ minutes & $DTN \leq 45$ minutes (Powers et al., 2019). Despite these recommendations, delays in stroke evaluations, imaging, decision making and treatment continue to challenge EDs, and have the potential to negatively impact patient outcomes. The purpose of this Doctor of Nursing Practice (DNP) project was to improve (AIS) treatment timeliness in a Level III emergency department (ED) by reducing computed tomography-to-needle (CTN) & door-to-needle (DTN) times among patients receiving intravenous (IV) thrombolytic therapy.

Methodology

An interdisciplinary ED-based quality improvement workgroup was formed with key stakeholders across the stroke care continuum. This workgroup met weekly for three months during the implementation project period. Quality improvement methodology with iterative PDSA cycles was utilized. Multiple process and outcome data was monitored, with a specific focus on reducing CTN and DTN times; while protecting the integrity of other watch metrics to ensure not to diminish already established workflows.

Results

The three-month implementation of this DNP project demonstrated successful improvement in the timeliness of stroke care. Through continuous and repetitive tests of change, workflow processes were optimized. Education was enhanced related to AIS recognition and evaluation. Communication was strengthened. And clinical decision making and treatment timeliness was improved. At the end of the three-month implementation period, the rolling 12-month DTN improved 13 percentage points (27% to 40%), while CTN performance improved 4 percentage points (26% to 30%). Process measures, such as ED arrival-to-CT completion time

Executive Summary

and Tenecteplase (TNK) order-to-administration time, among other key related stroke throughput metrics remained intact and continued to meet or exceed set targets throughout the implementation period.

Strengths

The most impactful strengths of this project included the interdisciplinary collaboration of the key stakeholders, leadership engagement, and the use of evidence-based quality improvement methodology. For the entire implementation period, each discipline had representation, through attendance and active participation in weekly QI meetings utilizing iterative PDSA cycles of continuous quality improvement and performance monitoring. The collaborative structure facilitated timely identification of barriers and allowed workflow modifications throughout the implementation period. Most importantly, improvements in CTN and DTN were achieved while maintaining other established stroke performance measures, demonstrating that targeted workflow improvements did not negatively affect other aspects of stroke care.

Limitations

This project was conducted over a three-month implementation period at a single Level III ED, which may limit generalizability in other settings. This short period limits the ability to determine or evaluate long term sustainability. Project outcomes may have been influenced by operational and organizational factors, including staffing, patient volume, seasonal fluctuations beyond control of the project team. Additionally, certain interventions agreed upon by the group were unable to be implemented due to large organizational and system barriers that limit timely approval by the end of the project period. Although limitations existed, the project demonstrated

Executive Summary

meaningful improvements that support future implementation and evaluation in similar emergency department settings.

Implications

This project demonstrated that structured, interdisciplinary QI initiatives can improve AIS treatment timeliness without compromising other critical stroke performance measures. Stroke symptom identification was enhanced from the point of arrival to the ED. Coordination and communication amongst key stakeholders across the stroke care continuum was enhanced. Standardized stroke and throughput processes were standardized to reduce variation and delays in care delivery. Targeted education for clinical staff and providers regarding the complexities of AIS management emphasized the importance of timely decision-making and coordinated care with both patients and families earlier in care processes. A stroke process flow map was established for consistent process integrity and consistency. The project findings support continued investment in leadership engagement, workflows, performance monitoring and ongoing continuous improvement to sustain improvements. Similar evidence-based interventions may be adopted for other emergency departments seeking to improve stroke care quality, throughput and patient outcomes.

Conclusions

Improving thrombolytic timing in the emergency department requires more than the implementation of a protocol or procedure. This project demonstrated the value and impact that focused quality improvement strategies can lead to improved stroke throughput processes and better patient outcomes. Engaged and active leadership, interdisciplinary collaboration, continuous PDSA cycles of performance monitoring and evaluation proved to be beneficial

Executive Summary

towards building a culture of evidence-based care. Because the implementation period was only three months, recommendations persist to seek organizational stroke infographic approval to support patient and family education to help reduce prolonged decision making. The ED should continue to biweekly review of stroke timeliness metrics to sustain gains, and continue to identify opportunities for improvement, and provide routine performance feedback. Stroke performance should be integrated into department and organizational quality dashboards, staff and provider meetings to support long term accountability & sustainability. ED leadership should continue to provide ongoing constructive criticism, ask questions, provide positive feedback and team recognition.

Executive Summary

References

Executive Summary. Content last reviewed July 2018. Agency for Healthcare Research and Quality, Rockville, MD.

<https://www.ahrq.gov/research/shuttered/acfselection/summary.html>

Powers, W. J., et al. (2019). Guidelines for the early management of patients with acute ischemic stroke. *Stroke*, 50(12), e344–e418. <https://doi.org/10.1161/STR.0000000000000211>