When Nurses Lead Change:
Improving Door to Alteplase Times for Stroke Alert Patients

Andrea Perry, MSN, RN, CNL, CEN, CPEN
Sutter Roseville Medical Center, Roseville, CA

Purpose

The American Heart Association Target: Stroke Phase II states that goals for alteplase administration for acute ischemic stroke should be set at 75% of cases within 60 minutes, and 50% within 45 minutes. Prior to this project, only 52% of patients were receiving alteplase within 60 minutes, and only 17% of patients were receiving it within 45 minutes.

The Stroke Champion Program was created to engage bedside nurses in barrier identification, optimization of Stroke Alert Response, and improved treatment times for patients receiving alteplase for acute ischemic stroke.

Setting

This project took place at a suburban community hospital. At time of completion, the emergency department (ED) had 34 licensed beds and saw more than 80,000 patients annually. It is an ACS accredited Level II Trauma Center, Joint Commission accredited Primary Stroke Center with Neurointervention capabilities, STEMI Center, and ENA Lantern Award Recipient.

Design

The process improvement project was designed to be led by bedside ED RNs. High performing RNs were identified by ED Leadership, including those who had demonstrated leadership in the department by serving as charge nurse, flow nurse, or preceptor, and had received positive evaluations from both their managers and peers. High performers from all shifts were invited to participate. The ED Clinical Nurse Leader (CNL) and Stroke Coordinators used Lean processes to facilitate RN identification of barriers and develop future state workflows.

For additional information or clarification, please contact Andrea Perry at perryac@sutterhealth.org

Participants

Twelve ED RNs served as Stroke Champions. The revised process was implemented for all patients presenting via ambulance within 6 hours of stroke symptom onset. All ED staff and ED providers (physicians and Advanced Practice providers) were educated prior to implementation, as were ancillary partners in lab and diagnostic imaging.

Methods

The ED CNL and Stroke Coordinators received approval from the Chief Nurse Executive to recruit 12 Champions and provide paid time for their work. Three 2-hour workshops were hosted, allowing the Stroke Champions to choose what worked best with their schedule. These meetings followed LEAN methodologies, allowing mapping of current state, barriers, and ideal future state. Feedback was summarized and Champions approved the new process. The Stroke Checklist was redesigned, outlining specific roles, timeline of events (such as what occurs before and after CT), and what to communicate post CT. "Grab and Go" IV start kits were created and staged. ED Providers, staff, and ancillary departments received electronic and in person education. During implementation, Stroke Champions were available to assist other staff during stroke activation. ED and Stroke Team Leadership also responded to alerts. Charts were reviewed restrospectively.

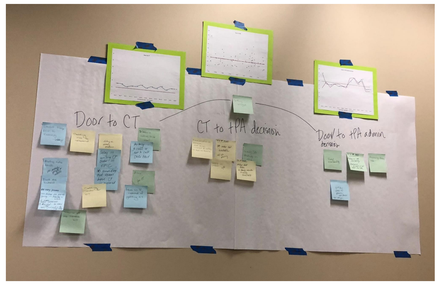

Figure 1. *Sorting the identified barriers to the three main segments of alteplase administration: Door to CT, CT to alteplase decision, and door to alteplase administration.*

Results

The resulting Stroke Alert workflow was revised twice based on staff feedback. Two main revisions occurred:

- Initial patient swarm moved from the ambulance foyer to the trauma bay due to issues with lighting and congestion.
- A Mayo stand was ordered for CT to facilitate IV placement during imaging.

Multiple data points were measured pre- and post-implementation. Pertinent metrics include Door to alteplase < 60 min, Door to alteplase < 45 min, median door to CT time, and Median door to alteplase time.

- Alteplase administered < 45 minutes rose from 17 to 47.9%, a 30.9% increase.
- Alteplase administered < 60 minutes rose from 52 to 71.2%, a 19.2% increase.
- Median Door to CT dropped from 16 to 14 minutes, a 12.5% decrease.
- Median Door to Alteplase time dropped from 58 to 47 minutes, an 18.97% decrease.

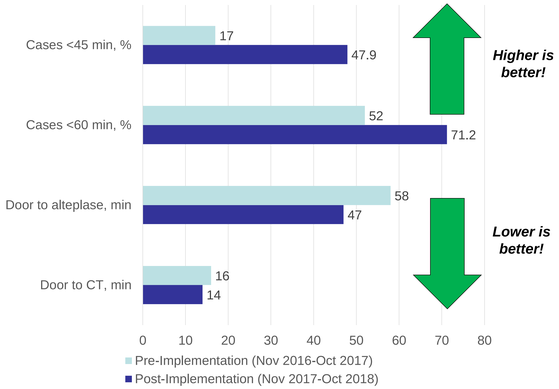

Figure 2*. Improvements in door to treatment times related to Stroke Champion process development and implementation.*

Limitations

Process improvement focused on ambulance arrival patients, as at least 70% of cases arrived in that manner. Data abstraction, however, did not separate ambulance traffic from walk in traffic. Delineation between the two arrival types and subsequent milestones could have demonstrated more substantial improvements in times to CT and treatment.

Implementation of the new stroke alert process occurred just prior to a winter surge in patient volume and admission holds. This may have contributed to delays out of staff's control. Further review of data post-surge could provide better data as to improvements during normal operating conditions.

Implications

Staff engagement is critical in development of efficient, effective processes. Not only can they speak to barriers that leadership may be unaware of, but they can aid their peers in owning and adopting new processes. It is important to adequately prepare staff for and support staff during process implementation. Involving and educating core department staff and ancillary staff ensures for a smooth process. Support during implementation helps to reinforce expectations and rapidly identify and address unexpected issues.

References

1. American Heart Association (2017). *Target: Stroke phase II*. Retrieved from http://www.strokeassociation.org/STROKEORG/Professionals/TargetStroke/Target-Stroke-Phase-II_UCM_469859_Article.jsp#.WUn96Gjyvb0
2. Fonarow, G.C., Smith, E.E., Saver, J.L., Reeves, M.J., Hernandez, A.F., Peterson, E.D., …Schwamm, L.H. (2011). Improving door-to-needle times in acute ischemic stroke: The design and rationale for the American Heart Association/American Stroke Association's Target: Stroke Initiative. *Stroke*, 42, 2983-2989. doi: 10.1161/STROKEAHA.111.621342
3. Marquis, B. L., & Huston, C. J. (2015). *Leadership roles and management functions in nursing: Theory and application* (8th ed.). Philadelphia, PA: Lippincott, Williams & Wilkins.