

Code Stroke

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Clinical Problem

Decreasing door to needle times is an important issue in stroke tissue based treatment. Research shows the patient will benefit from decreasing tPA administration times. Even shaving one minute from the treatment time has been shown to give the patient 1.8 extra days of healthy life (Meretoja et al., 2014). In addition, in-hospital mortality and post-administration intracranial hemorrhage decreases as administration time decreases (Fonarow et al., 2014).

The clinical question is what are the best practices to decrease door to needle times in Alteplase (tPA) administration?

Background

Baptist Health Floyd is a 250-bed hospital in a suburban setting. The ED averages around 50,000 visits per year. The hospital began pursuing Primary Stroke certification in 2014. In 2015, a Lean Six Sigma project was initiated because door to needle times for Alteplase (tPA) administration were averaging around 62 minutes, with the goal being less than 60 minutes and a secondary goal of less than 45 minutes. The ED door to CT turnaround times were averaging about 44.98 minutes with only 64% less than the 45 minute goal. The lab door to turnaround times averaged about 56.46 minutes with only 40% of the results under the 45-minute goal. The Code stroke process had variation in practice.

Project description

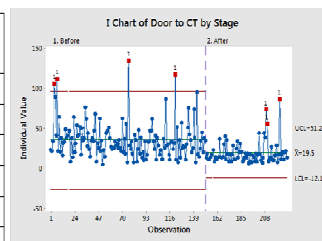
A review of literature was conducted that revealed best practices in decreasing door to Alteplase (tPA) administration including practices such as direct to CT, single call activation, and team concepts (Middleton, Grimley, & Alexandrov, 2015).

Lean Six Sigma methodology was used to analyze the current process. Lean Six Sigma is a process improvement method that uses a team to help remove waste in a process. A multidisciplinary team was formed that included ED staff, physicians, radiology technicians, laboratory technicians, stroke coordinator, stroke neurologist, and Lean Six Sigma Black Belt. The team completed a map of the current process, identified barriers and time wasters. They mapped out a new process which included detailed standard work instructions and a swim lane of the process. The new processes included:

- Direct to CT for both EMS and triage patients
- Triage nurse activates internal team B to notify ED MD using set of common stroke symptoms
- ED MD completes quick ABC assessment, activates Code Stroke
- Code stroke overhead paged to notify remainder of team
- Team including lab and neurologist swarms the patient in CT suite
- Toolkit of Code Stroke paperwork, lab supplies and IV start supplies located in CT suite
- Alteplase initiation in CT
- Debriefing process to identify further quality improvement opportunities

Results

Measure	Prior (Jan-Sept)	Post (Oct - Nov)
CT turnaround compliance within 45 minutes	64%	92%
CT turnaround time average	44.98 minutes	27.93 minutes
Lab turnaround compliance	40%	75%
Lab turnaround time average	56.46 minutes	38.63 minutes
Door to needle time average	61.74 minutes	50.71 minutes
Alteplase (tPA) treatment rate	13.94%	22%



Conclusion & Implications

The Lean Six Sigma methodology was a viable option to help identify barriers and non-value-added steps in the process. Benefits include:

- Streamlining and standardizing the process
- Each role was provided step by step directions of their role in the process
- Clear criteria to activate Team B decreased individual nurse subjectivity and empowered the nurse
- Identification of an ED physician champion and end results of the change assisted with obtaining ED physician buy-in

The changes have assisted in driving down the variation in door to CT and lab results. But most of all, it has assisted in decreasing door to Alteplase (tPA) administration as well as increasing Alteplase administration rates which will ultimately improve patient outcomes.

References

- Fonarow, G. C., Zhao, X., Smith, E. E., Saver, J. L., Reeves, M. J., Bhatt, D. L., ... Schwamm, L. (2014, April 23/24). Door-to-Needle times for tissue plasminogen activator administration and clinical outcomes in acute ischemic stroke before and after a quality improvement initiative. *JAMA*, 311(16), 1632-1640.
- Meretoja, A., Keshkaran, M., Saver, J. L., Tatlisumak, T., Parsons, M. W., Kaste, M., ... Churilov, L. (2014, April). Stroke thrombolysis save a minute, save a day. *Stroke*, 45(). <http://dx.doi.org/10.1161/STROKEAHA.113.002910>
- Middleton, S., Grimley, R., & Alexandrov, A. W. (2015, February). Triage, treatment, and transfer: Evidence-based clinical practice recommendations and models of nursing care for the first 72 hours of admission to hospital for acute stroke. *Stroke*, 46, e18-e25.