Improving Door to CT Times for Stroke Patients Using EMS Pre-Notification

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Background

Approximately 795,000 strokes occur in the United States each year. Every 40 seconds, someone in the US has a stroke. Early recognition of stroke signs and symptoms, along with rapid evaluation and treatment, is critical towards achieving optimal patient outcomes. Phase II of the American Heart Association/American Stroke Association’s Target: Stroke Direct to CT Protocol includes:

• Pre-hospital notification by Emergency Medical Services of patients suspected of presenting with stroke.
• Readiness of Emergency Department (ED) staff to expedite care of the stroke patient upon arrival.
• Rapid ED MD assessment of the patient.
• Direct transport to CT.

These initiatives are the initial process steps towards achieving the ultimate goal of Door to Needle (thrombolytic therapy) Time of less than 60 minutes and were the focus of our process improvement efforts.

Project Aim and Design

The objective of this project was to optimize our pre-notification process and decrease the Door to CT time for stroke patients arriving by EMS to the Emergency Department as part of an initiative to decrease Door to Needle Time. The PDCA methodology was employed. The Emergency Department (ED) team in collaboration with local EMS agencies, redesigned and implemented the EMS Stroke Screen\(^1\), a pre-notification tool that is used to communicate potential stroke cases en route to the ED. Education of ED and EMS staff occurred in August 2016, followed by a September implementation. Upon dispatch, the paramedic now speaks directly to the ED physician on duty, conveying the information captured by the tool, and a pre-hospital stroke code is initiated. By consistently using this tool and method of pre-notification, patients are received immediately upon arrival, quickly assessed by the ED physician, and expedited to the CT scanner.

Outcomes

Baseline data from Q1 16 to Q3 16 reflect a median quarterly Door to Stroke Code time ranging between 1 and 5 minutes and a median Door to CT Initiated time ranging from 16-18 minutes. Q4 16 is a transitional quarter, where we educated and began implementing the redesigned processes. Q1 and Q2 17\(^2\) represent post-intervention results, with Door to Stroke Code time -4 and -9 minutes respectively, and Door to CT Initiated 7 and 6 minutes respectively.

Lessons Learned

By implementing a pre-notification tool with local EMS agencies, increasing awareness of stroke metrics, and introducing a direct to CT process, we were able to significantly reduce both Stroke Code and CT Initiation times. Additionally, EMS pre-notification calls have increased from between two to five per quarter prior to the initiative, to ten in Q1 2017 demonstrating their engagement, collaboration and commitment, both to the revised process and providing high-quality and timely stroke care. Exediting the care of potential stroke patients arriving to the ED and rapid transport to imaging are critical steps in providing stroke care, when minutes matter.

Summary

Timely evaluation and treatment are key in ensuring positive outcomes for patients presenting to the ED with signs and symptoms of a stroke. Utilizing this process, eligible patients may receive time sensitive treatments earlier and have a better chance of survival and improved functional outcomes.

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1 We would like to acknowledge Dr. Evie Marcolini and the YNHH ED for the adaption of their EMS Stroke Screen.

2 At the time of abstract submission, Q2 data is through February 2017 only.