

Improving Medical and Endovascular Management for Acute Ischemic Stroke Through Multidisciplinary Education and Simulation

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Problem Definition

- In patients with acute ischemic stroke (AIS), increased time to IV tPA (door to needle, DTN) and time to endovascular therapy (door to puncture, DTP) are associated with poor clinical outcomes.
- American Heart Association/Stroke Association, Joint Commission, and Society of Vascular and Interventional Neurology 2018 guidelines recommend:
 - Median tPA time (DTN) less than 60 minutes, secondary goal 45 minutes.
 - Median Endovascular therapy (DTP) time less than 90 minutes

2017 ED/Gibbon Stroke Intervention Times

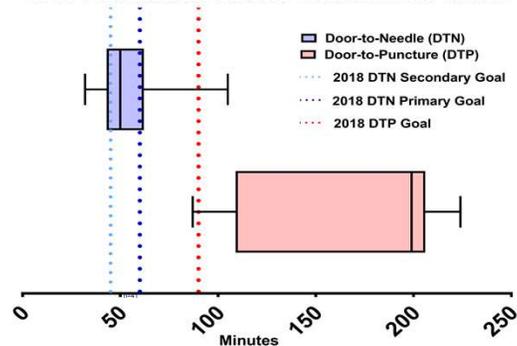


Figure 1. Jefferson 2017 DTN mean time 55.8 min (95% CI 50.3-61.1min, median 50min) and DTP mean time 169 min (95% CI 133-201min, median 199min).

Aims for Improvement

Primary goals:

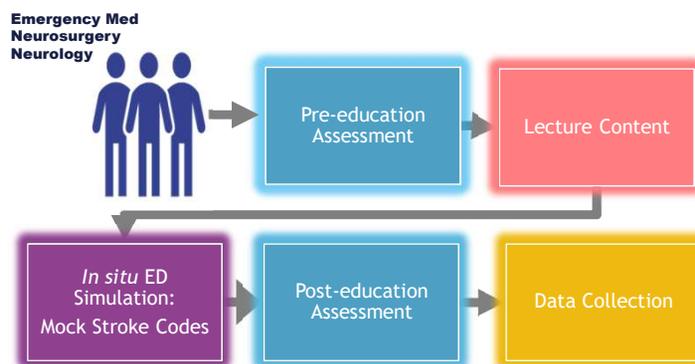
- Reduce door to treatment times (both DTN and DTP) to meet and exceed existing guidelines metrics.
- Educate residents about acute stroke management, including national guidelines and new institutional protocols to improve efficiency during stroke alerts.

Proposed Intervention

Implement a new education program for residents from the departments of Neurology, Neurosurgery, and Emergency Medicine on management of acute stroke alerts. This program will be for current residents and part of the initial training for new interns.

Specific components include:

- Didactic session
- Simulation sessions: Conducted in the emergency department (ED) with standardized patients needing evaluation for tPA and endovascular therapy.
- Self-assessment and content exams

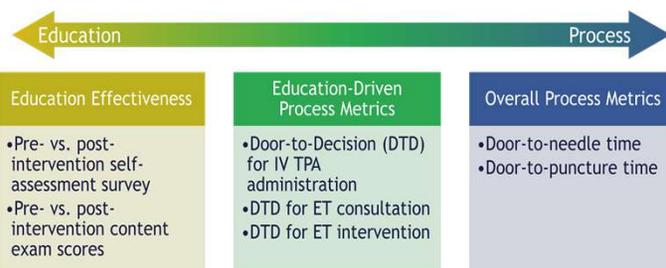


Didactic Lecture Content:

- Clinical presentations of stroke, including signs and symptoms concerning for large vessel occlusion.
- Indications/contraindications for IV tPA
- Interpretation of CT/CTA imaging studies.
- Indications for endovascular thrombectomy
- Recording of time sensitive outcome data
- Review of institutional protocols

Measurement Strategy

We hypothesize that education will improve resident understanding of stroke treatment and execution of stroke management protocols, which will translate into measurable improvements in stroke time metrics. Measured parameters are outlined below:



Primary end points will be three Door-to-Decision (DTD) times to indirectly assess the education program. Secondary metrics will be DTN and DTP times. This information will help identify gaps between education and final time outcomes to elucidate delays of care and other potential areas requiring intervention.

A standardized note template has been created to track time metrics. Statistical analysis will include T-tests and Chi-square tests for the above metrics and regression analysis for factors associated with improved treatment times.

Implementation Plan

Implementation will be coordinated with the existing multi-disciplinary AIS process working group.

- July 2018: Neurology lecture/stimulation
- August 2018: Neurosurgery/ED lecture content
- December 2018: multi-departmental mock stroke code simulation session
- Monthly data collection by AIS working group