

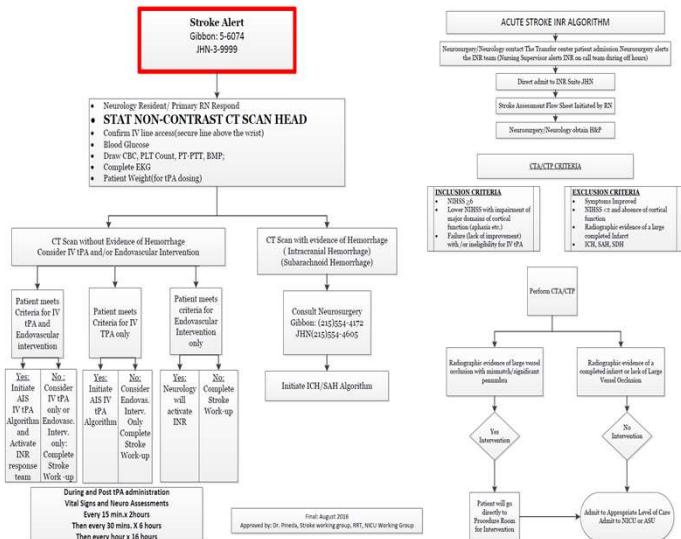
# Process Improvement for Endovascular Thrombectomy in Patients Presenting with Acute Ischemic Stroke

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## BACKGROUND

- Endovascular thrombectomy (ET) reduces disability and improves patient outcomes when provided in addition to standard medical therapy for treatment of patients with acute ischemic stroke (AIS).
- Recent trials have shown clinical effectiveness and improved outcomes in select patients who present up to 24 hours after symptom onset.
- Every hour delay in endovascular reperfusion results in less favorable disability and functional independence outcomes at 90 days.
- Recommendations from The Society for Vascular and Interventional Neurology, adopted by the Joint Commission, suggest a median door-to-puncture (DTP) time of <90 minutes for ET
- Thomas Jefferson University (TJU) serves as a regional comprehensive stroke center, and maintains a reputation as a national leader in stroke care and endovascular therapies.
- Patients undergo ET at the Jefferson Hospital for Neuroscience (JHN), and frequently present as direct transfers from outside hospitals (OSH).
- Patients who present with AIS to the TJU emergency department (ED) or as inpatients in the Gibbon building require both emergent evaluation and transfer to JHN for ET.
- Anecdotal differences exist in patients with AIS requiring ET who present directly to JHN vs. those transferring from the TJU ED/Gibbon, but this difference has never been critically evaluated.
- Existing stroke activation protocols at TJU do not reflect the latest recommendations, extending indications for ET up to 24 hours after symptoms onset.

2016 JeffersonStroke Activation and ET Protocols

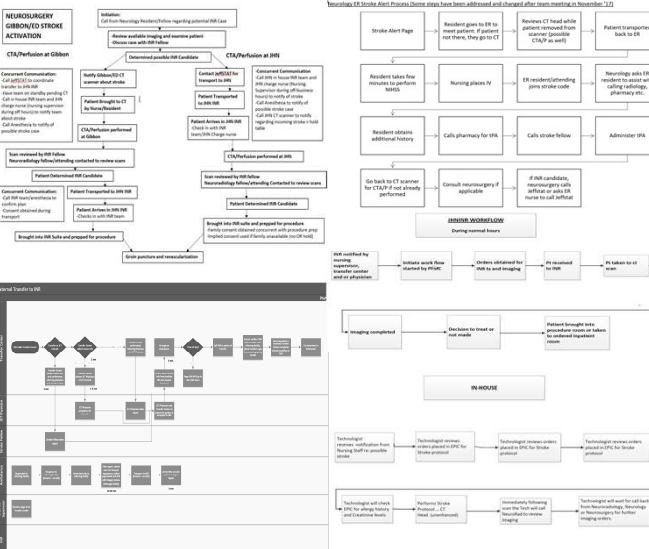


## AIMS

- Critically evaluate the existing stroke activation and ET protocols for compliance with new 2018 metrics and guidelines.
- Review DTP times under the existing protocol to assess for potential inefficiencies or gaps in care delivery, specifically addressing differences between processes at JHN compared to ED/Gibbon.
- Make changes to the existing stroke alert protocol to better reflect current guidelines, streamline care, and ultimately improve process metrics (DTP times).
- Establish a system for recursive continuous analysis of AIS patients to identify protocol gaps, inefficiencies and areas for further intervention.

## METHODS

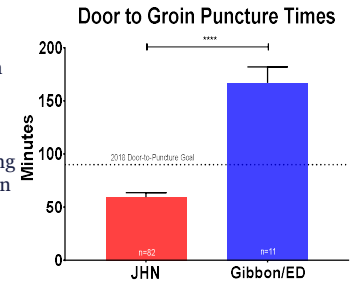
A multidisciplinary working group was created to review existing protocols and address any discrepancies with the new 2018 AIS management guidelines. The multidisciplinary working group consisted of members from: Neurosurgery, Neurology, Emergency Medicine, Neurocritical Care, JHN Nursing, Interventional Neuroradiology (INR) nursing, ED Nursing, Nursing Education and Pharmacy. Individual process maps were created to identify areas of inefficiency or noncompliance. Examples are shown below:



Additionally, the institutional "Get with the Guidelines" stroke data base was reviewed to obtain DTP times for all patients who underwent ET from January to December of 2017. Differences were assessed between patients presenting directly to JHN vs through the ED/Gibbon.

## RESULTS

Database review demonstrated a significant difference in mean DTP times between patients presenting primarily to JHN vs. those presenting from the ED and Gibbon building (59.4min vs. 166.8 min,  $p < 0.0001$ , median 50.5 vs 199).



Process charts revealed clear inefficiencies in the coordination of care for patients who presented to the ED/Gibbon compared to those who presented directly to JHN. At JHN, a streamlined process existed for rapid evaluation and treatment of eligible patients for ET. Skilled and experienced INR staff, as well as the geographic centrality of required equipment for advanced imaging and angiography, facilitates rapid evaluation and treatment of patients immediately on arrival. Contrarily, in the TJU ED, numerous siloed processes require simultaneous activation and coordination for successful protocol execution. Furthermore, additional services, such as transportation and pharmacy (for IV TPA delivery), were needed to facilitate patient care. These factors likely resulted in the prolonged DTP times seen in these patients.

## CONCLUSIONS AND FUTURE STEPS

Analysis of flow charts and existing data demonstrates a clear difference in processes for patients who present with AIS to the ED vs. those who present directly to JHN. DTP times for patients presenting to the TJU ED was not only significantly greater than those presenting to JHN, but over twice the time interval recommended by the evidence-based guidelines. Addressing the ED stroke activation protocol represents a clear target for further process improvement interventions.

Following preliminary evaluation, a new protocol has been instituted as of May, 2018. Identification of new relevant time points is actively being incorporated into the protocol and documented in patient EMRs. Biweekly meetings of the AIS working group are being held to continuously analyze both specific cases as well as process metrics to identify areas requiring further intervention or modification. Limited select cases of patients requiring ET presenting to the TJU ED under the new protocol have documented DTP times less than 60 minutes.

