

# Time Study and Process Improvement of the Halifax Infirmary Acute Stroke Protocol

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## 1. Introduction

**Time is brain - 2 million neurons lost/minute**  
 Stroke is a debilitating disease

- Hemorrhagic (brain bleed)
- Ischemic (clot blocks blood to the brain)

**Acute Stroke Protocol (ASP)**

- tPA (intravenous medication dissolves clot)
- EVT (surgery to remove the clot)

**Act FAST - Treatment is time sensitive**

- tPA < 4.5hrs EVT < 12 hrs.



## 2. Problem Definition

The Halifax Infirmary (HI) is not reaching Canada's Heart & Stroke Foundation quality benchmarks

- Results in worse outcomes for patients.

**Goals:**

- Identify and quantify delays in the system
- Provide suggestions to improve time
- Improved performance reporting

## 3. Methodology

- Time study
- Analysis of historical performance
- Develop visualizations of quality indicators
- Evaluate improvement strategies
- Stakeholder interviews

EHS                      Emergency Dept.                      Radiology  
 Neurology              CT/Imaging Dept.                      Anesthesia  
 Locating                      Registration Clerk

## 6. Recommendations

**Emergency Department**

- Get patient info from EHS while moving to CT
- Lab collection kit (IV lines, blood vials, covid swab)
- Outlined requirements for single call activation

**Imaging**

- Collect patient jewelry in a baggie with patient sticker before arriving at CT by Paramedics or Physician
- Neurologist and Radiologist training to confidently diagnose, attain consent, and administer tPA

**tPA**

- Administer Bolus (Needle) at CT and finish IV line in ED
- Carry a stroke kit
- Do not wait for blood results from the lab

**EVT**

- Set up layout photo for each radiologist's preferences
- Further pre-stage with a cover & tag and lock safety system

**Standard operating procedures**

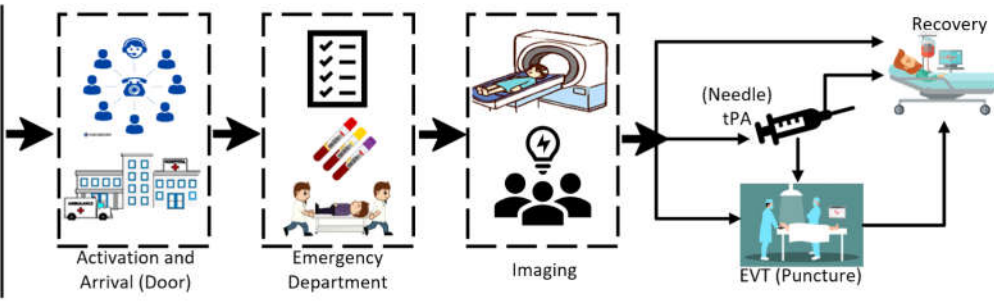
- Work with stroke neurologists to develop best SOP guidelines
- Improved monthly performance report

## 4. Process and Scope

ASP Activations at the HI  
 Acute Ischemic Stroke Treatments  
 Capture times of subtasks and Quality Indicators

- Door to Imaging (DTI)
- Door to Needle (DTN)
- Door to Groin Puncture (DTP)
- Image to Puncture (ITP)

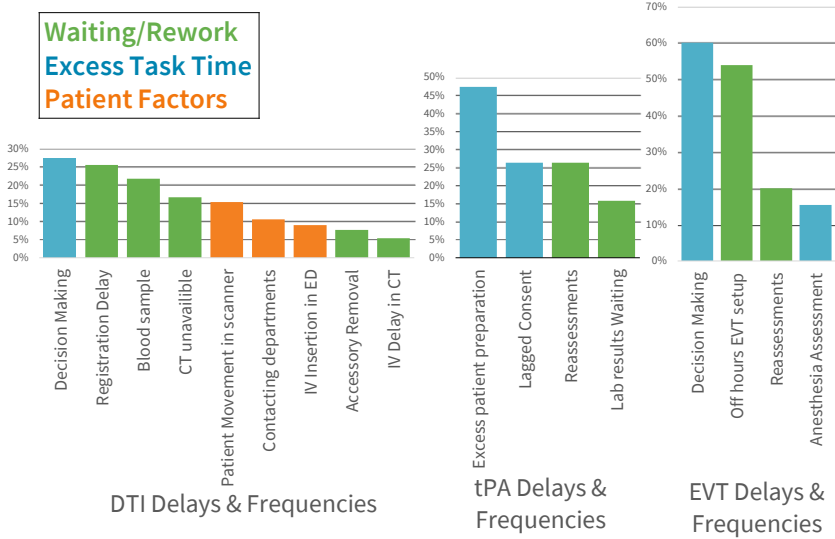
Measured 35 in-hospital subtasks  
 Nov.17 2021-Feb.28 2022



## 5. Results

**Primary causes of delays:**

- Communication issues create waiting times
- Lack of standardized tasks
- Few standard operating procedures for best practices
- Variation in what is required of each task
- Some team members idle
- Tasks that could be done in parallel



**Time study results and Quality Indicators (minutes)**

	Trials	IQR	Median	Target Median	90 <sup>th</sup> Percentile	Target 90 <sup>th</sup> Percentile
DTI	102	12-20	15	15	42	-
DTN	19	35-71	42	30	89	60
DTP	13	70-102	87	60	108	90
ITP	11	53-88	71	45	97	-

## 7. Conclusion

