

# Does Hospital Participation in Telestroke Lead to Faster DTN for Spoke Hospitals?

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## PURPOSE/BACKGROUND

- Door-to-needle (DTN) time for acute ischemic stroke (AIS) varies substantially between hospitals.
- Discrepancies in DTN time for tissue plasminogen activator (tPA) delivery are, in part, due to lack of available resources such as vascular neurology coverage.
- Telestroke brings neurological expertise to spoke hospitals by connecting them with the resources at hub hospitals.

## OBJECTIVE & HYPOTHESIS

- Within our telestroke network, we aimed to determine whether the strength of a spoke hospital's connection to the hub hospital was associated with patients' DTN time for tPA delivery.
- We hypothesize the patients presenting to spoke hospitals with more frequent telestroke contact to the hub hospital will have shorter DTN times than those with less frequent contact.

## METHODS

### Data Source

- Detailed stroke patient time and date information contributed from participating spoke hospitals

### Population

- All tPA-treated ischemic stroke patients with and without telestroke consults presenting to spoke hospitals from 2006-2016

### Primary Predictor Variable

- Strength of connection between hub and spoke hospital, defined as number of Telestroke consults from the patient's presenting hospital during the year of the patient's presentation

### Analysis

- Linear regression analysis to examine relationship between hospitals' Telestroke participation and patients' DTN times
- We controlled for hospitals' tPA volume, temporal trends, and clustering within hospitals



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## RESULTS

### 16 Spoke Hospitals (2006-2016) 367 tPA-treated Patients

Hospitals' Median DTN:	78.8 min (IQR 71.3-85)
Patient's Median DTN:	76 min (IQR 61-98)
Patients treated within 60 min:	24.8% (n=91)
Median telestroke consults/year:	37 (IQR 61-98)

Table 1. Summary of door-to-needle data results.

- Among all 367 patients, the median door-to-needle time was 76 minutes (IQR 61-98).
- 24.8% of all patients were treated within 60 minutes (n=91).
- The spoke hospitals' median DTN was 78.8 min (IQR 71.3-85).
- Throughout the study, the median number of telestroke consults per year was 37 (IQR 61-98).
- The strength of connection between the hub and spoke hospital was significantly associated with faster DTN time for patients: 1.8 minutes gain per 10 additional consults ( $p < 0.001$ ) as shown in Figure 1.

### Predicted DTN Based on Spoke Hospital's Strength of Connection to MGH

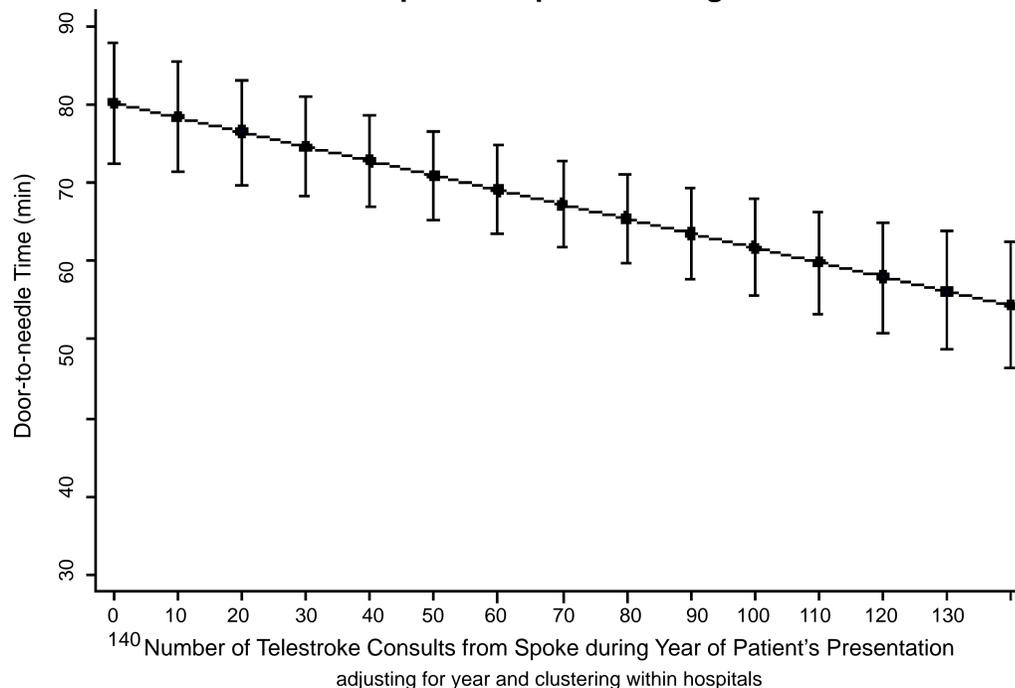


Fig. 1. Correlation between the number of Telestroke consults during the year a patient presented to that spoke hospital and their DTN time ( $p < 0.001$ )

## CONCLUSIONS

- More frequent contact between a telestroke spoke and its hub was associated with faster tPA delivery for patients, even after accounting for hospitals' tPA volume and secular trends in DTN improvements.
- This study highlights the added benefits of increased utilization of telestroke.

## FUTURE WORK

This study is part of a larger quality improvement initiative, MGH DTN60, as outlined in Figure 2.

- Determining the correlation between tPA delivery and Telestroke participation is one component in evaluating performance of tPA delivery and providing feedback to participating hospitals.
- Spoke hospitals' experience with Telestroke will be determined through survey questionnaires when performance feedback is given to help MGH DTN60 identify areas of improvement in stroke care.
- Widespread intervention and education efforts within the Partners Telestroke Network are still needed to stress the importance of and facilitate quick, efficient tPA-delivery.

### MGH DTN60

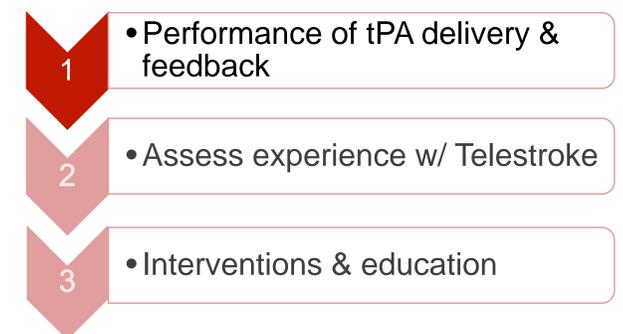


Fig. 2. MGH DTN60 initiative general outline.

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