

DIDO Times in Anterior LVO Ischemic Stroke

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Introduction

- Acute ischemic stroke is a major cause of death and disability. Every 30 minute delay in time from onset to treatment lowers the likelihood of a good outcome.¹
- Door-in-door-out (DIDO) is defined as the duration from time of arrival at a primary stroke center (PSC) to time of discharge to a comprehensive stroke center (CSC) for mechanical thrombectomy(MT). Shorter DIDO time relates to improved outcomes.
- There is no standardized DIDO for ischemic stroke, though the American Heart Association (AHA) offers an ideal DIDO time of <90 minutes for 50% or more of patients.²

Aims and Objectives

- Identify, compare, analyze components of DIDO times from two PCSs (Hospital A and B) within Beaumont transferring candidates for MT to the same CSC.
- Identify which modifiable DIDO components are most important for hospital systems to optimize in order to improve stroke outcomes.
- Create a basis from which a prospective study could be launched seeking to address the areas of improvement noted in this study to achieve lower DIDO times.

Methods

- Retrospective study comparing DIDO component duration of ischemic stroke patients transferred from PSC Hospital A and B to the CSC in Royal Oak for mechanical thrombectomy from December 2020 until present using the electronic medical record.
- Inclusion Criteria: Confirmed anterior LVO on CT/CTA, first worked up at Hospital A or Hospital B, MT performed at Royal Oak Beaumont (CSC) between December 2020 and July 2022, presented <24 hours after symptom onset.
- Exclusion Criteria: posterior circulation LVO
- Results were analyzed via SAS v9.4. Given the patients represented the entire population, no statistical testing was necessary.

Results

- Patient selection began with all patients transferred from Hospitals A and B with a diagnosis of stroke and this was narrowed down via inclusion and exclusion criteria displayed in Figure 1.
- Demographics between the two populations were relatively equivocal in age, sex, and race as seen in Table 1.
- There was found to be a significant difference between DIDO times between Hospital A and B.
- The DIDO components found to be notably prolonged were completing imaging (CT order to CTA Completion) and dispatch time to patient pick up as seen in Table 2.
- Markers following PSC discharge were comparable between the two groups including travel time to CSC, door to puncture time, door to reperfusion time, and post operative complications.

Table 1. Demographics

Age, Median (IQR)	Hospital A (N=22) 77.5 (73.0, 83.0)	Hospital B (N=9) 72.0 (66.0, 73.0)	Total (N=31) 75.0 (69.0, 83.0)
Sex, n(%)			
F	10 (45.5%)	6 (66.7%)	16 (51.6%)
M	12 (54.5%)	3 (33%)	15 (48.4%)
Race, n(%)			
Asian	0 (0.0%)	1 (11.1%)	1 (3.2%)
Black	0 (0.0%)	1 (11.1%)	1 (3.2%)
Other	1 (4.5%)	0 (0.0%)	1 (3.2%)
White	21 (95.5%)	7 (77.8%)	28 (90.3%)

Table 2. DIDO Component Median in Minutes (IQR)

	Hospital A (N=22)	Hospital B (N=9)	Total (N=31)
Arrival to CT Order Time	4.5 (3.0, 8.0)	4.0 (2.0, 8.0)	4.0 (3.0, 8.0)
CT Order to CTA Completion (Imaging Overall)	35.0 (26.0, 49.0)	108.0 (74.0, 122.0)	44.0 (29.0, 68.0)
CTA Completion to Decision to Transfer	12.0 (5.0, 30.0)	29.5 (19.0, 41.5)	21.0 (7.0, 39.0)
Transfer Request to Acceptance	30.0 (23.0, 42.0)	37 (21.0, 40.0)	30.0 (23.0, 42.0)
Time from Decision to Departure	49.5 (44.0, 62.0)	42.0 (32.0, 57.0)	49.0 (40.0, 58.0)
Dispatch Time to Patient Pick Up	45.5 (40.0, 58.0)	38.0 (29.0, 52.0)	45.0 (38.0, 52.0)
DIDO Time	113.5 (93.0, 136.0)	162 (139.0, 215.0)	129.0 (99.0, 162.0)

Figure 1.

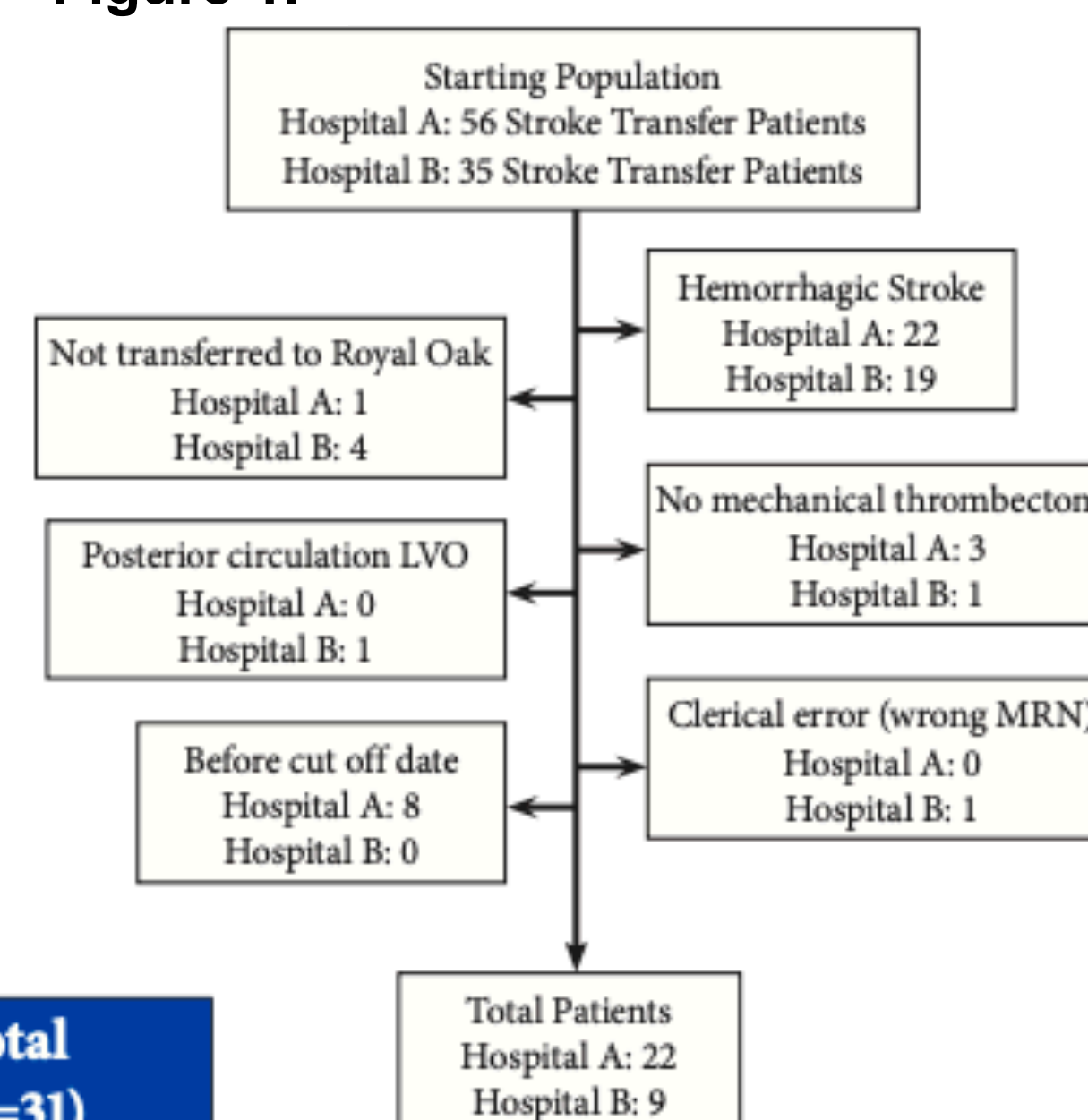


Figure 1. DIDO Time in Minutes

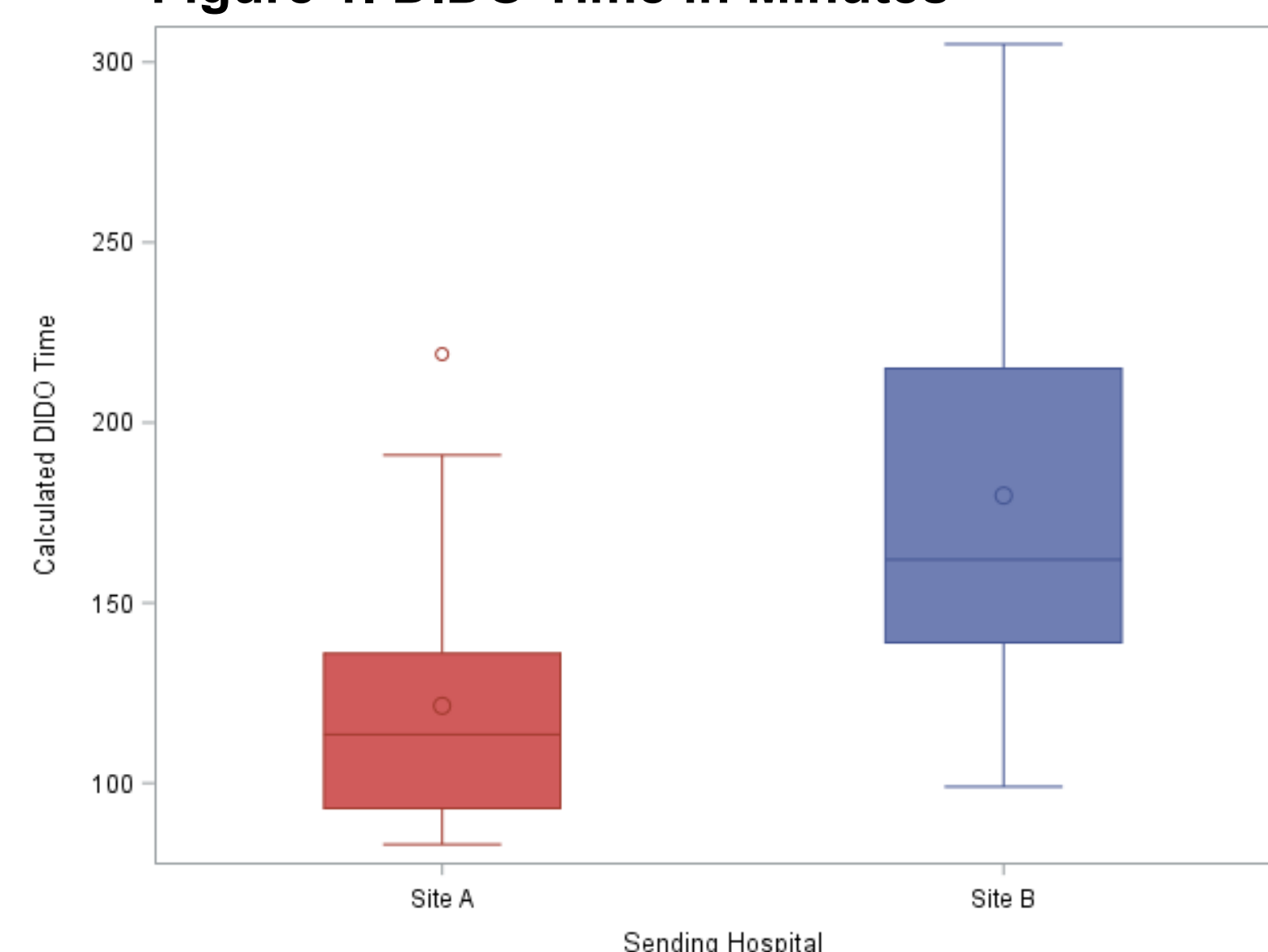
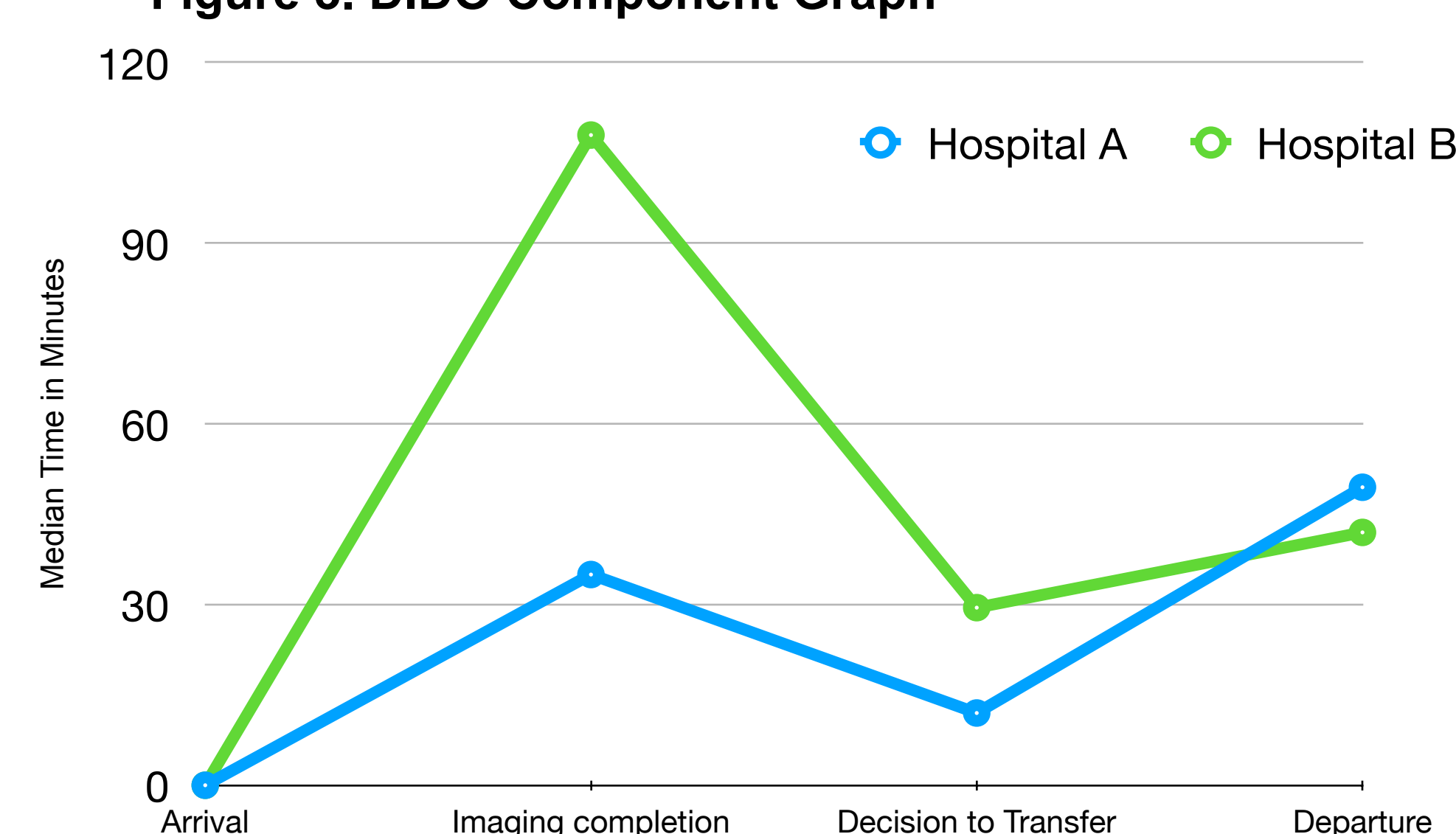


Figure 3. DIDO Component Graph



Discussion

- DIDO times for both PSCs are well above the ideal DIDO time of <90 minutes proposed by the AHA (0/31 cases reached this goal).²
- The greatest opportunities for DIDO improvement lie in decreasing imaging completion and ambulance wait times.
- The discrepantly longer imaging completion time at Hospital B (median 108 minutes) versus Hospital A (median 35 minutes) offers a great area of opportunity for Hospital B to improve DIDO time.
- Both PSCs had similar prolonged wait times for ambulances to arrive for transfer to CSC.
- Recognizing and addressing deficiencies in stroke care can improve patient outcomes and decrease future burden on healthcare systems and society.³

Conclusions

- There is a notable difference in DIDO times between the two PCSs transferring candidates to the CSC in Royal Oak for mechanical thrombectomy.
- Process improvement to reduce imaging times and delays in patient transportation in our hospital system would likely yield the greatest effect on improving patient outcomes.
- Further research is warranted to determine a standardized DIDO for ischemic stroke for PSCs.

References

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