

# Trends and determinants of door-in-door-out times for patients transferred for mechanical thrombectomy: analysis of national registry data

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## Introduction

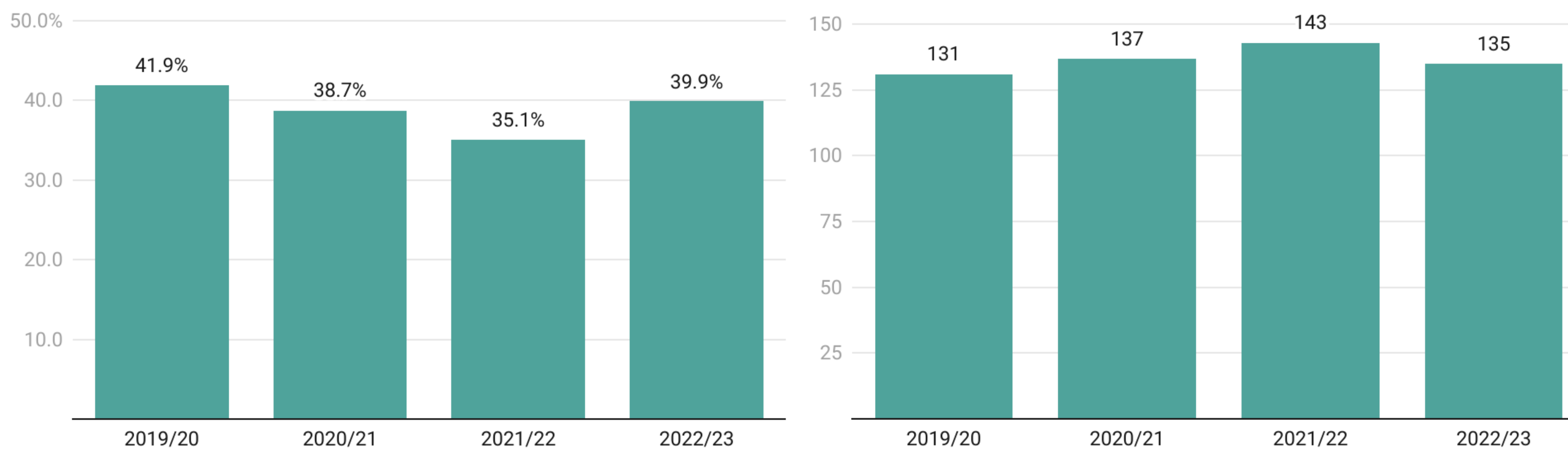
Current consensus guidelines stipulate that the median door-in-door-out (DIDO) time for inter-hospital transfer for mechanical thrombectomy (MT) should not exceed 45 minutes within acute stroke centres, with evidence suggesting that prolonged DIDO times may have deleterious effect on outcomes following MT. Identifying factors associated with DIDO can support the delivery of quality improvement interventions to facilitate improved patient flow.

## Method

Data from the Sentinel Stroke National Audit Programme (SSNAP) were used to describe trends in the proportion of patients with a DIDO less than 120 minutes compared with greater than or equal to 120 minutes for patients undergoing MT. A range of patient characteristics and hospital factors were described and compared using univariate analyses.

## Results

4,472 patients were transferred for and underwent MT between April 2019 and March 2023. 38.7% (1,731) of patients had a DIDO less than 120 minutes (figure 1). The median DIDO over the 4 years was 137 minutes [IQR 100-193] (figure 2).



**Figure 1.** Proportion of patients with a DIDO less than 120 minutes per year. **Figure 2.** Median DIDO (minutes) per year.

The patient characteristics and hospital factors described are shown in figure 3. Characteristics and factors associated with longer DIDO times are shown in table 1.

Patient characteristics		Hospital factors	
Female gender	p=0.04	Delays in imaging from arrival	p<0.0001
Pre-stroke diabetes	p=0.04	Lower rates of thrombolysis	p<0.0001
Previous stroke/TIA	p=0.03	Out of hours arrival	p<0.0001
Less severe stroke	p<0.0001	Weekend arrival	p=0.001
Lower pre-stroke disability	p<0.001	Slower thrombolysis	p<0.0001
Pre-stroke hypertension	p=0.03		
AF prior to stroke and on anticoagulants	p=0.007		

**Table 1.** Patient characteristics and hospital factors associated with longer DIDO times.

## Patient characteristics

	< 120 minutes	≥ 120 minutes
Gender (Female) (%)	43.0	46.0
Pre-stroke mRS (0) (%)	75.0	71.0
Pre-stroke mRS (1) (%)	18.0	19.0
Pre-stroke mRS (2) (%)	6.0	8.0
Pre-stroke mRS (3) (%)	2.0	2.0
Pre-stroke mRS (4) (%)	0.2	1.0
Pre-stroke mRS (5) (%)	0.2	0.1
Pre-stroke hypertension (%)	45.0	48.0
Pre-stroke congestive heart failure (%)	4.0	5.0
Pre-stroke diabetes (%)	13.0	15.0
Previous stroke/TIA (%)	13.0	16.0
Pre-stroke atrial fibrillation (%)	19.0	21.0
If AF prior to stroke, on anticoagulants (%)	13.0	15.0
Median age	71.0	72.0
Median NIHSS	17.0	16.0

## Hospital factors

	< 120 minutes	≥ 120 minutes
Received thrombolysis (%)	66.0	52.0
Thrombolysis received within 30 minutes of arrival (%)	31.0	9.0
Thrombectomy received on the weekend (%)	18.0	22.0
Arrival out of hours (%)	9.0	28.0
Median onset to arrival (mins)	93.0	93.0
Median arrival to brain imaging (mins)	15.0	24.0

**Figure 3.** Comparisons of patient characteristics and hospital factors for patients with a DIDO less than 120 minutes and those with a DIDO 120 minutes or more. The teal lines show the characteristics or factors which are significantly different between the two cohorts of patients. Out of hours arrival = arrival between 8pm and 8am.

## Conclusion

Identification of modifiable process factors during inter-hospital transfer for MT can provide a target for quality improvement initiatives to expedite patient flow and reduce treatment delay.