



Massachusetts Data Brief

Primary Stroke Service, CY 2023

Overview – Calendar Year 2023

The Primary Stroke Service (PSS) designation in Massachusetts indicates health care facility readiness to evaluate and treat acute stroke patients 24 hours a day. Massachusetts PSS facilities have a regulatory requirement to submit data to the Department of Public Health (DPH) by 105 CMR 130.1410. After clinical evaluation, eligible patients with acute ischemic stroke may be treated with thrombolytics such as tPA, a type of drug that dissolves stroke-causing clots, improving patient recovery and outcome.¹ Evaluation for treatment involves ruling out medical contraindications and computerized tomography scan (CT). Current recommendations encourage prompt evaluation and treatment of eligible patients, specifically facilities should perform a CT scan and administer thrombolytic therapy within 60 minutes of facility arrival.² Research shows an expanded window of 4.5 hours from patient last known well to treatment is effective at reducing morbidity and mortality.³

Table 1. Massachusetts PSS Stroke Patient Characteristics, CY 2023 (n=15,852)

Stroke Type	N (%)	Rate (per 100,000)
Intracranial Hemorrhage	1,744 (11.0)	30.8
Ischemic	11,005 (69.4)	194.3
Subarachnoid Hemorrhage	582 (3.7)	10.3
Transient Ischemic Attack	2,486 (15.7)	43.9
Not otherwise specified	35 (0.2)	.6
Sex		
Female	7,896 (49.8)	267.7
Male	7,953 (50.2)	293.0
Race and Ethnicity		
American Indian/Alaska Native, nH/nL	32 (0.2)	404.7
Asian American/Pacific Islander, nH/nL	512 (3.2)	124.1
Black/African American, nH/nL	1,351 (8.5)	369.3
Hispanic/Latinx	1,183 (7.5)	192.7
Multi-race, nH/nL	12 (0.1)	5.6
White, nH/nL	11,931 (75.3)	294.6
Unable to be determined, nH/nL	831 (5.2)	N/A
Age group		
18-44	725 (4.6)	28.1
45-64	4,018 (25.3)	213.2
65+	11,109 (70.1)	924.9
Patient Means of Arrival		
EMS	8,528 (53.8)	N/A
Private Transport	4,548 (28.7)	N/A
Transfer from another hospital	2,506 (15.8)	N/A
Not documented or unknown	270 (1.7)	N/A

Data Sources: PSS Stroke Registry, extracted September 24, 2024 Rate denominator based on UMass Donahue Institute 2020 Massachusetts Population Estimate⁴ NH=non-Hispanic/non-Latinx, AI/AN=American Indian/Alaska Native, AAPI=Asian American and/or Pacific Islander

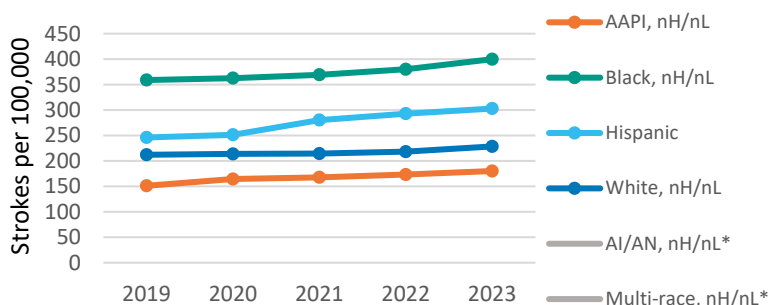
Other notable findings:

- The median age of patients was 73 years with an interquartile range of 62-82 years.
- The NIH Stroke Scale (NIHSS) measures the overall severity of stroke, ranging from 0-42. The median score in MA was 2 with an interquartile range of 0-7.

Stroke-Care Quality Findings:

- The median time from last known well (LKW) to emergency department (ED) arrival was **292 minutes** with an interquartile range of 85-789 minutes.
 - 5,812 (37%) patients had no LKW or arrival time documented
- The median time from ED arrival to CT scan initiation was **38 minutes** with an interquartile range of 14-112 minutes.
 - 2,906 (18%) patients did not have a CT scan time documented
- The median time from CT scan to thrombolytic administration was **42 minutes** with an interquartile range of 29-60 minutes.
- Overall, for patients with thrombolytic administration, the median LKW to treatment was **135 minutes** with an interquartile range of 98-192 minutes.

Age Adjusted Stroke Rates by Race/Ethnicity, CY 2019-2023



*Non-Hispanic AI/AN and Multi-race are not displayed due to small number counts.

Conclusions

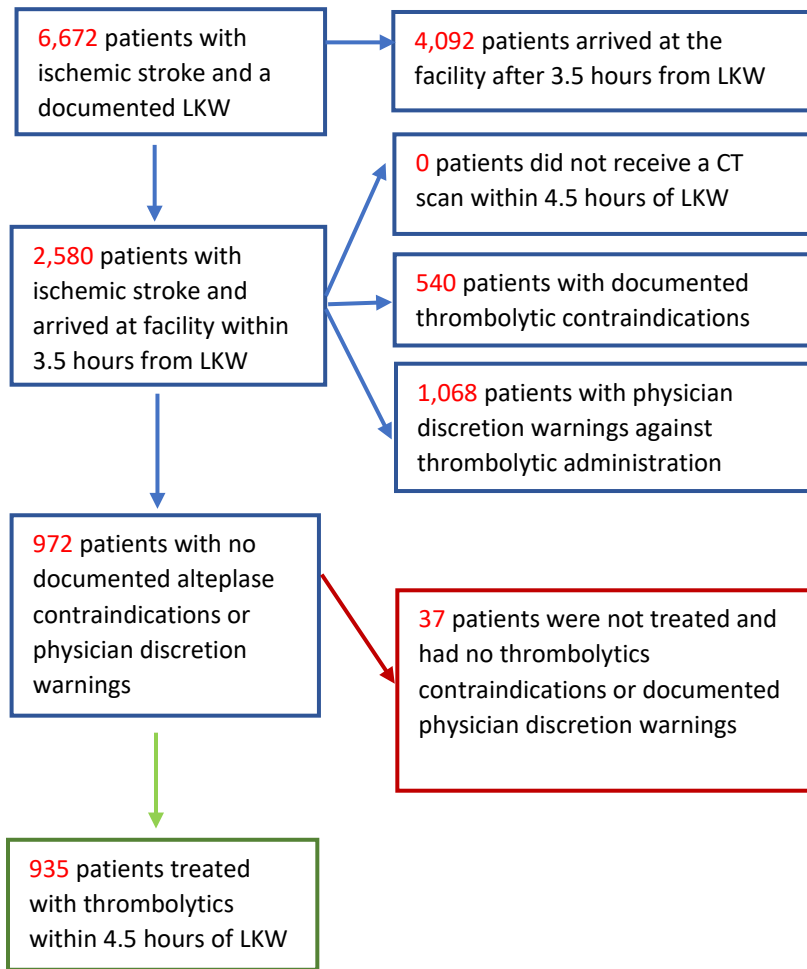
- In CY 2023, Hispanic and NH Black populations (302.9/100,000 and 399.9/100,000, respectively) experienced statistically significant higher rates of stroke compared to the White population (228.5/100,000)
- From CY 2019-2023, the statewide age-adjusted stroke rates have remained stable (237.7/100,000 in 2019 vs 237.1/100,000 in 2023). NH White and NH AAPI populations had no significant change. Rates among Black populations remain higher than their White counterparts. There was a statistically significant increase for Hispanic populations (5.8% annual percent change) and the gap appears to be widening.



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Massachusetts Ischemic Stroke Patient Evaluation and Treatment with Thrombolytics, CY 2023 (N=11,005)



Notable findings among ischemic stroke patients:

- Of the 11,005 ischemic strokes reported, 6,672 (61%) had a documented last known well (LKW).
- Of those with documented LKW, 2,580 (39%) arrived at the Emergency Department (ED) within 3.5 hours, allowing sufficient time for patient evaluation and treatment.
 - 0 patients that arrived within 3.5 hours of LKW did not receive a CT scan within 4.5 hours of LKW, 540 patients that arrived within 3.5 hours had a documented thrombolytic contraindication, and 1,068 patients had a documented provider discretion warning.
- 935 (36%) patients that arrived within 3.5 hours received treatment with thrombolytics. A total of 37 patients arrived within 3.5 hours, had no documented drug contraindications or warnings, and did not receive treatment. Further patient evaluation and provider education is recommended to ensure treatment of all eligible patients.

5 Most Common Provider Discretion Warnings

- Delay in Patient Arrival
- Stroke severity too mild (non-disabling)
- Care-team unable to determine eligibility
- Rapid improvement of symptoms
- IV or IA thrombolysis/thrombectomy at an outside hospital prior to arrival

Summary & Recommendations

In Massachusetts, notable disparities persist in age-adjusted stroke rates across race/ethnicity, especially among the Non-Hispanic Black and Hispanic population. These disparities are consistent with national trends⁵. These differences may stem from a higher number of risk factors and societal challenges, including structural racism. According to the American Heart Association, chronic discrimination and related stress can lead to long-lasting and cumulative damage to the brain⁶. In 2023, the Massachusetts Coverdell Stroke Program hosted learning sessions for the awareness of systemic and historic racism that impact health outcomes for people of color. DPH recommends targeted interventions to eliminate societal drivers of these unequal outcomes, as well as community-based outreach to vulnerable populations to enhance education on risk factors essential to mitigate these disparities and promote health equity. In addition to these efforts, ongoing research and data collection are necessary to identify and monitor these trends.

Methods: Data were extracted from the MA PSS registry on September 24, 2024, patient records discharged between January 1, 2023 and December 31, 2023 were included. Definitions used by DPH and the American Heart Association may differ. Stroke events are excluded from the report if the patient were enrolled in a clinical trial, did not have an acute stroke diagnosis, had a stroke after hospital arrival, or the patient was under 18 at the time of the event. Numbers on this report are preliminary and subject to change.

Citations

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