CBE ID

1952

Title

Time to Intravenous Thrombolytic Therapy – 60 Minutes

Project

Management of Acute Events, Chronic Disease, Surgery, and Behavioral Health

Endorsement Status

Endorsed

Is Under Review

Yes

Next Maintenance Cycle

Spring 2026

Previous Endorsement Cycle

Fall 2019

Initial Endorsement

Thu, 11/01/2012 - 07:18

Steward

American Heart Association

1.0 New or Maintenance

Maintenance

1.1 Measure Structure

Single Measure

1.3 Electronic Clinical Quality Measure (eCQM)

No

1.6 Measure Description

Percent of acute ischemic stroke patients receiving intravenous tissue plasminogen activator (thrombolytic) therapy during the hospital stay who have a time from hospital arrival to initiation of thrombolytic therapy administration (door-to-needle time) of 60 minutes or less. This is a process measure.

1.6a Material Specification Change(s)

Yes

1.6b Summary of Specification Changes

Updates to measure specifications since the previous endorsement (2019):

- Expanded measure focus from IV alteplase to IV thrombolytics, as alteplase is no longer the only IV thrombolytic used for management of acute ischemic stroke. This update impacts multiple population criteria.
- Specified the measure applies to patients 18 years of age and older in the initial population/denominator, rather than limiting to this age range as an exclusion.
- Added an exclusion for patients transferred from other hospitals.

While the current PQM website lists multiple denominator exceptions for this measure (including delayed IV alteplase administration beyond 60 minutes and documented medical reasons for treatment delay), the American Heart Association has always specified these criteria as denominator exclusions in official versions of the measure. These criteria continue to function as exclusions in the measure construct submitted for re-endorsement and do not represent a methodological change.

1.7 Measure Type

Process

1.8 Level of Analysis

Facility

1.9 Care Setting

Hospital: Acute Care Facility, Hospital: Critical Access, Hospital: Inpatient

1.10 Measure Rationale

In 2023, stroke accounted for approximately 1 of every 19 deaths in the United States. On average, an American died of a stroke every 3 minutes and 14 seconds. Between 2021 and 2023, the overall prevalence of stroke amongst Americans was approximately 3 percent. As Americans are living longer, this rate is expected to climb because prevalence of stroke increases with age. Each year approximately 795,000 people experience a new or recurrent stroke. From 2021 to 2022, the direct medical costs, including hospital outpatient, inpatient stays, Emergency Department (ED) visits, prescribed medicine, and home health care associated with ischemic stroke and transient ischemic attack was $23.8 billion (Palaniappan et al., 2026).

Of all strokes, approximately 87 percent are ischemic (Palaniappan et al., 2026). Multiple studies have shown that the rapid administration of intravenous recombinant tissue-type plasminogen activator (tPA) to appropriate patients is a proven, effective treatment in restoring blood flow and reducing long-term morbidity for ischemic stroke patients. Every minute an ischemic stroke patient goes untreated, he/she loses 1.9 million neurons, and every hour this patient goes untreated, he/she loses 120 million neurons (Saver 2006). Recent guidelines regarding treatment for acute ischemic stroke emphasize the importance of initiating treatment with IV Thrombolytics as soon as possible (Prabhakaran et al., 2026). The American Stroke Association notes that existing scientific literature reveals a “consistent finding that treatment effect is highly time dependent” (Prabhakaran et al., 2026). Pooled data from Randomized Controlled Trials indicate

that the earlier the treatment, the greater the benefit, which diminishes over time. Registry data from American Heart Association (AHA) Get With The Guidelines – Stroke (GWTG®– Stroke) hospitals confirm this temporal relationship: treatment started more rapidly (evaluated in 15-minute increments) was associated with reduced in-hospital mortality (OR, 0.96 [95% CI, 0.95–0.98]; P<0.001), reduced symptomatic intracerebral hemorrhage (OR, 0.96 [95% CI, 0.95–0.98]; P<0.001), increased independent ambulation at discharge (OR, 1.04 [95% CI, 1.03–1.05]; P<0.001), and higher rates of discharge to home (OR, 1.03 [95% CI, 1.02–1.04]; P<0.001) (Saver et al. 2013).

Despite strong evidence supporting timely thrombolytic administration for patients with ischemic stroke, meaningful gaps in care persist. Our analysis of 2025 GWTG®–Stroke data demonstrated lower performance among hospitals with fewer than 50 beds compared with hospitals with more than 100 beds. (83.40 percent vs. 91.98 percent). Patient-level differences were also observed, with younger patients less likely to receive IV thrombolytics within 60 minutes of arrival compared with older patients (82.17 percent among ages 18–29 vs. 93.11 percent among ages 80+).

This measure is intended to reduce door-to-needle times and increase the proportion of eligible patients receiving intravenous thrombolytic therapy within 60 minutes of hospital arrival.

References

Latha P. Palaniappan, Norrina B. Allen, Zaid I. Almarzooq, Cheryl A. M. Anderson, Pankaj Arora, Christy L. Avery, et al., Heart Disease and Stroke Statistics—2026 Update: A Report of U.S. and Global Data From the American Heart Association, Circulation, 153, 9, (e275–e906), (2026). https://doi.org/10.1161/CIR.0000000000001412

Jeffrey L. Saver, Time Is Brain—Quantified, Stroke, 37, 1, (263–266), (2006). https://doi.org/10.1161/01.str.0000196957.55928.ab

Jeffrey L. Saver, Gregg C. Fonarow, Eric E. Smith, et al., Time to Treatment With Intravenous Tissue Plasminogen Activator and Outcome From Acute Ischemic Stroke, JAMA, 309, 23, (2480–2488), (2013). https://doi.org/10.1001/jama.2013.6959

Shyam Prabhakaran, Nestor R. Gonzalez, Kori S. Zachrison, Opeolu Adeoye, Anne W. Alexandrov, Sameer A. Ansari, et al., 2026 Guideline for the Early Management of Patients With Acute Ischemic Stroke: A Guideline From the American Heart Association/American Stroke Association, Stroke, 57, 3, (e1–eXXX), (2026).

1.11 Measure Webpage

None.

1.13 Data Dictionary

Attached

1.13a Attach Data Dictionary

AHASTR13-Data-Dictionary-and-Coding-Instructions.pdf

1.14 Numerator

Patients who receive IV thrombolytic at the reporting hospital within 60 minutes after triage

1.14a Numerator Details

Patients who receive IV thrombolytics at the reporting hospital within 60 minutes after arrival.

The target population for the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure numerator is identified via GWTG®– Stroke registry data. It captures qualifying patients who received IV thrombolytic therapy within 60 minutes after arrival at the measured entity. Data are regularly collected and attributed to participating facilities. In order to calculate the numerator criteria, facilities must document the date and time at the minute precision of patient arrival and initiation of IV thrombolytic therapy as per the equation below.

[Date/time IV thrombolytic therapy initiated - Arrival Date/Time <= 60 minutes]

All data elements are available for review in the attached data dictionary.

1.15 Denominator

All patients in the initial patient population [all patients 18 years and older with a primary diagnosis of ischemic stroke] who received IV thrombolytic at the reporting hospital

1.15a Denominator Details

The Time to Intravenous Thrombolytic Therapy – 60 Minutes denominator captures patients who qualified for and received IV thrombolytic therapy based on their age and diagnosis via GWTG®– Stroke registry data. The measure algorithm begins with the Initial Patient Population (IPP), which is comprised of all patients age 18 years and older with a primary diagnosis of ischemic stroke as per the equation below.

[Age>=18 AND Final clinical diagnosis related to stroke = Ischemic Stroke]

From the IPP, the denominator is derived as the subset of patients in the IPP who received IV thrombolytic at the reporting hospital, as per the equation below.

[Same as IPP AND IV thrombolytic initiated at this hospital = Yes]

1.15b Denominator Exclusions

Denominator exclusions are applied after the denominator population is established, and before the application of numerator criteria. These criteria identify patients for whom initiation of IV thrombolytic therapy is clinically inappropriate, as well as patients with indicators of potential data quality issues. These patients should not proceed to the measure numerator either because the quality action would be inappropriate for them, or because they have data quality issues indicating that their measure scores would be invalid. These are:

• Patients whose stroke occurred after hospital arrival (in ED/observation/inpatient).

• Patients whose date/time of arrival and/or date/time of thrombolytic administration are blank, not documented, or N/A.

• Patients with a negative calculated time difference between hospital arrival and administration of IV thrombolytics indicating that IV thrombolytics were initiated prior to hospital arrival.

• Patients with a date last known well, but no time last known well

• Patients who receive IV thrombolytic greater than 4.5 hours after last known well

• Patients transferred from other hospital

• Patients who received IV thrombolytic at an outside hospital or by EMS/Mobile Stroke Unit

• Patients with documented Eligibility or Medical reason for delay in treatment

• Clinical Trial

1.15c Denominator Exclusions Details

Please see equations below to define denominator exclusion criteria for the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure.

• Stroke occurred after hospital arrival (in ED/Obs/inpatient) [Patient location when stroke symptoms discovered = stroke occurred while patient was an inpatient in your hospital]

• Patients whose date/time of arrival and/or date/time of thrombolytic administration are blank, not documented, or N/A. [Hospital arrival date/time = null OR Hospital arrival date/time precision = Unknown OR Hospital arrival date/time precision is missing minutes OR IV thrombolytic initiation date/time = null OR IV thrombolytic initiation date/time = Unknown OR IV Thrombolytic initiation date/time is missing minutes]

• Patients with a negative calculated time difference [IV thrombolytic initiation date/time < Hospital arrival date/time]

• Patients with a date last known well, but no time last known well [Date/time patient last known to be well is missing minutes]

• Patients who receive IV thrombolytic greater than 4.5 hours after last known well [Date/time patient last known to be well in MM/DD/YYYY HH:MM format AND IV thrombolytic initiation date/time - Date/time patient last known to be well > 4.5 hours]

• Patients transferred from other hospital [How patient arrived at your hospital = Transfer from other hospital]

• Patients who received IV thrombolytic at an outside hospital or by EMS/Mobile Stroke Unit [IV thrombolytic at an outside hospital or EMS/mobile stroke unit = Yes]

• Patients with documented Eligibility or Medical reason for delay in treatment [If IV thrombolytic was initiated greater than 60 minutes after arrival, documented eligibility or medical reason(s) for delay = Yes]

• Clinical Trial [During the hospital stay, was the patient enrolled in a clinical trial in which patients with the same condition as the measure set were being studied = Yes]

1.15d Age Group

Adults (18-64 years), Older Adults (65 years and older)

1.16 Type of Score

Rate/proportion

1.17 Measure Score Interpretation

Better performance = Higher score

1.18 Calculation of Measure Score

The measure score is calculated by identifying the total number of eligible patients meeting the numerator criteria and dividing by the total number of eligible patients meeting the denominator criteria after denominator exclusion criteria have been applied and these patients removed.

Step 1: Identify the initial patient population

Check to see if patient is 18 years or older; only include patients who are at least 18 years of age at the time of arrival.

Check to see if there is documentation of a final clinical diagnosis of ischemic stroke; only include patients with ischemic stroke.

Step 2: Identify the denominator population

From the initial patient population, check to see if there is documentation that patient received IV thrombolytic at the hospital of interest; only include patients who received IV thrombolytics.

Step 3: Remove denominator exclusions due to ineligibility for the quality action

Check to see if stroke occurred after hospital arrival; exclude those patients for which stroke occurred while patient was an inpatient at the reporting hospital.

Check to see if patient arrival date is documented; exclude those patients for which arrival date is unable to be determined (blank/unknown/ or MM/DD/YYYY only)

Check to see if patient arrival time is documented; exclude those patients for which arrival time is unable to be determined (blank, unknown, or MM/DD/YYYY only)

Check IV thrombolytic initiation date; exclude those patients for which IV thrombolytic initiation date is unable to be determined (blank, unknown, or MM/DD/YYYY only)

Check IV thrombolytic initiation time; exclude those patients for which IV thrombolytic initiation time is unable to be determined (blank, unknown, or MM/DD/YYYY only)

IV thrombolytic Initiation Date/Time should not be less than (documented as occurring prior to) hospital arrival date/time; exclude those patients for whom arrival IV thrombolytic initiation date/time is less than hospital arrival date/time

Check to see date/time last known well; exclude patients for whom time last known well is unable to be determined (blank/unknown)

Check to see timing in hours. Timing (IV thrombolytic Initiation Date/Time - Date/Time Last Known well) should be less than or equal to 4.5 hours. If greater than 4.5 hours exclude patients.

Check to see if patient was transferred from another hospital; exclude those patients that were transferred from another hospital to the reporting hospital.

Check to see if patient received IV thrombolytics at an outside hospital or by EMS/Mobile Stroke Unit; exclude those patients who received IV thrombolytics at an outside hospital or by EMS/Mobile Stroke Unit.

Check to see if the patient had a documented eligibility or medical reason for the delay in initiation of IV thrombolytics; exclude those patients who had a reason for their delay documented by a physician, advanced practice nurse, physician’s assistant, or pharmacist.

Check to see if patient is enrolled in a clinical trial; exclude those patients who were enrolled, at the time of the hospital stay, in a clinical trial related to the study of patients with the same condition as the measure or measure set.

This measure does not have any exceptions.

Step 4: Calculate numerator compliance

If timing is less than or equal to 4.5 hours, check to see if timing for IV thrombolytic therapy time (IV Thrombolytic Initiation Date/Time - Arrival Date/Time) is less than or equal to 60 minutes.

1.19 Measure Stratification Details

The measure is not stratified.

1.20 Types of Data Sources

Registries

1.21a Data Collection Tool URL(s)

http://example.com

1.25 Data Source Details

Data were obtained from the GWTG®– Stroke registry. GWTG®– Stroke is an in-hospital program for improving stroke care by promoting consistent adherence to the latest scientific treatment guidelines. GWTG®– Stroke is a nationally representative quality improvement program. Nearly 3,000 hospitals currently participate in the program, with more than 11 million patient records captured. Facilities can choose between third party abstraction, batch upload of data in the GWTG specified format, or manual abstraction. These methods have proven feasible over years of data collection. The Association team also conducts User Acceptance Testing multiple times in the year to ensure measure feasibility, reliability, and validity.

For the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure, the analytic dataset used for re-endorsement analytics includes hospitals across all 50 states, as well as the District of Columbia, Puerto Rico, and Guam. The analytic dataset encompasses approximately 1,390 accountable entities and 912,661 patients.

1.26 Minimum Sample Size

There is no minimum sample size required to calculate performance scores. However, there are various volume criteria considered within the GWTG®– Stroke quality award program, of which this measure is a part of. For the purposes of measure testing for consensus-based entity re-endorsement, our team restricted testing to sites with at least a minimum sample size of 20 patients in alignment with CMS/MIPS requirements.

2.1 Attach Logic Model

AHASTR13-Logic-Model-Attachment.pdf

2.2 Evidence of Measure Importance

Association GWTG®– Stroke measures are reviewed by a team of subject matter experts that includes neurologists, interventionalists, nursing representatives, and informaticists annually to confirm measures remain meaningful for achievement or recognition programs. This measure has been found to be meaningful since its first submission for consensus-based entity endorsement. Clinician volunteers support the continued measurement to drive meaningful change in practice.

Door-to-needle time is a modifiable care process with a well-established relationship to neurological recovery, mortality, and long-term independence following acute ischemic stroke. Achieving a door-to-needle time within 60 minutes is a critical priority because the benefits of intravenous thrombolysis are highly time-dependent.

Approximately 1.9 to 2 million neurons are irreversibly lost for every minute of reperfusion delay (Zhou et al., 2025; Xiao et al., 2025; Kumar et al., 2025). Decreasing DTN is consistently associated with broad positive outcomes, including improved 90-day functional outcomes, reduced in-hospital mortality, fewer bleeding complications, and higher rates of discharge to home (Zhou et al., 2025; Mikulík et al., 2022; Xian et al., 2021). "Ultrashort" DTN of 20 minutes or less significantly lowers the risk of symptomatic intracranial hemorrhage and reduces the likelihood that a patient will require nursing home admission or domiciliary care (Mikulík et al., 2022; Butt et al., 2021). Multiple studies cited in the 2026 Guideline for the Early Management of Patients with Acute Ischemic Stroke released by the American Heart Association/American Stroke Association note that every 15-minute reduction in treatment lag of Intravenous Thrombolysis provides a reduction in the odds of death (Prabhakaran et al., 2026). The official Class I guidance statement from the American Heart Association/American Stroke Association states that “In adult patients with Acute Ischemic Stroke (AIS) who are eligible for IVT within 4.5 hours of symptom onset, treatment should be initiated as quickly as possible (Level of Evidence: N-NR).” Recent evidence extends these benefits to long-term recovery, showing that faster treatment measured in 15-minute intervals significantly increases "home time,” or days spent at a private residence, and reduces the risk of all-cause mortality and hospital readmission within the first year (Man et al., 2023; Man et al., 2020). Beyond physical recovery, every 15-minute reduction in onset to needle time has been associated with a 7.3 percent lower likelihood of cognitive impairment at follow-up (Sujanthan et al., 2025).

The recent adoption of this measure as a criterion in the U.S. News & World Report Best Hospitals rankings validates the Association’s registry measure as an important resource for assessing quality.

References

American Heart Association. (n.d.). *Get With The Guidelines®–Stroke*.

https://www.heart.org/en/professional/quality-improvement/get-with-the-guidelines/get-with-the-guidelines-stroke

Butt, J. H., Kruuse, C., Kragholm, K., Johnsen, S. P., Kristensen, S. L., Havers-Borgersen, E., ... & Fosbøl, E. L. (2021). Nursing home admission and initiation of domiciliary care after ischemic stroke: The importance of time to thrombolysis. Journal of Stroke and Cerebrovascular Diseases, 30(8), 105916.

Kumar, A., Kumar, M., Verma, P., Pal, R., Nagi, M., Mahesh, K. V., ... & Khurana, D. (2025). Effects of stroke nurse-led acute stroke management on treatment time benchmarks, intravenous thrombolysis rates, and patient outcomes: A systematic review and meta-analysis. Journal of Stroke and Cerebrovascular Diseases, 34(3), 108216.

Man, S., Xian, Y., Holmes, D. N., Matsouaka, R. A., Saver, J. L., Smith, E. E., ... & Fonarow, G. C. (2020). Association between thrombolytic door-to-needle time and 1-year mortality and readmission in patients with acute ischemic stroke. JAMA, 323(21), 2170–2184.

Man, S. Solomon, N., Mac Grory, B., Alhanti, B., Uchino, K., Saver, J. L., ... & Fonarow, G. C. (2023). Shorter door-to-needle times are associated with better outcomes after intravenous thrombolytic therapy and endovascular thrombectomy for acute ischemic stroke. Circulation, 148(1), 20–34.

Mikulík, R., Bar, M., Bělašková, S., Černík, D., Fiksa, J., Herzig, R., ... & Václavík, D. (2022). Ultrashort door-to-needle time for intravenous thrombolysis is safer and improves outcome in the Czech Republic: Nationwide study 2004 to 2019. Journal of the American Heart Association, 11(12), e023524.

Prabhakaran, S., Gonzalez, N. R., Zachrison, K. S., Adeoye, O., Alexandrov, A. W., Ansari, S. A., ... & Yaghi, S. (2026). 2026 Guideline for the early management of patients with acute ischemic stroke: A guideline from the American Heart Association/American Stroke Association. Stroke, 57.

Sujanthan, S., Puveendrakumaran, P., Dainty, K. N., Barense, M., Lanctot, K. L., Owen, A. M., ... & Hill, M. D. (2025). Faster thrombolysis is associated with improved cognitive outcomes in patients with acute ischemic stroke treated with alteplase and tenecteplase: A substudy of the AcT Trial. Stroke, 56(3). (Also indexed in Eur Stroke J, 10.1177/23969873251323171).

Xian, Y., Xu, H., Smith, E. E., Saver, J. L., Reeves, M. J., Bhatt, D. L., ... & Fonarow, G. C. (2021). Achieving more rapid door-to-needle times and improved outcomes in acute ischemic stroke in a nationwide quality improvement intervention. Stroke, 52(4), 1328–1338.

Xiao, A. F., Li, Y. F., Feng, G. Q., Ao, Y. P., Gu, B., Wang, J., & You, J. Q. (2025). Impact of timeline-based management on treatment efficiency and outcomes in acute ischemic stroke: a quasi-experimental study. Annals of Medicine, 57(1), 2561793.

Zhou, H., Wen, Y., Qu, J., Dai, M., Li, S., Wan, W., & Chen, Y. (2025). Impact of emergency stroke green channel implementation on door-to-needle time and 90-day outcomes in acute ischemic stroke patients. World Neurosurgery, 202, 124392.

2.4 Performance Gap

To analyze performance scores, our team used data from 912,661 patients in the initial patient population at 1,390 facilities contributing to the GWTG®– Stroke registry in 2024 and 2025. 82,089 patients met denominator criteria for the measure.

Table 1. Performance Scores by Decile

Table 1: Mean Performance Score by Decile, Facility-Level, 2024-2025

	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Mean Performance Score	89.18	19.05	59.33	77.58	84.48	89.24	92.40	94.86	96.50	97.88	99.50	100.00	100.00
N of Entities	1,390		139	139	139	139	139	139	139	139	139	139	
N of Persons / Encounters / Episodes	82,089		4,805	6,453	6,425	6,928	7,840	8,900	9,244	11,203	12,349	7,942	

2.6 Meaningfulness to Target Population

The American Heart Association conducted outreach to 16 stroke survivors to gather feedback on the meaningfulness of the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure.

Six of the16 stroke survivors responded to a brief survey about the measure. All respondents (100 percent) rated the measure at the highest possible level, indicating that it is extremely true that the measure is meaningful to them as stroke survivors, that tracking this care could help clinicians and practices improve care delivery, and that receiving an intravenous thrombolytic within 60 minutes is important to both clinicians and patients. Avoidance of death and comorbidities, and the maintenance and improvement of functional status are universally held to be ideal treatment outcomes.

3.1 Contributions Towards Closing Care Gaps

Despite strong evidence supporting timely thrombolytic therapy for acute ischemic stroke, persistent gaps in door-to-needle performance remain across institutional and patient subgroups. Prior literature has documented differences in treatment timeliness by race, sex, and time of presentation, with women and Black patients experiencing longer door-to-needle times, particularly during off-hours, highlighting variation in stroke systems of care (Oluwole et al., 2017).

Internal empirical analyses using 2025 GWTG®–Stroke data further demonstrate variation across hospital and patient subgroups. Performance on the Time to Intravenous Thrombolytics – 60 Minutes measure was lower among smaller hospitals with less than 50 beds compared to hospitals

with more than 100 beds (83.40 percent vs. 91.98 percent). Patient-level differences were also observed, with younger patients less likely to receive IV thrombolytics within 60 minutes of arrival compared with older patients (82.17 percent among ages 18–29 vs. 93.11 percent among ages 80+). Collectively, these findings indicate that gaps in care persist that warrant continued surveillance.

Timeline-based protocols have been shown to improve clinical outcomes in Acute Ischemic Stroke patients (Xiao et al. 2025). Hospitals can leverage measure performance to implement targeted strategies to improve door-to-needle time.

References

Xiao, A. F., Li, Y. F., Feng, G. Q., Ao, Y. P., Gu, B., Wang, J., & You, J. Q. (2025). Impact of timeline-based management on treatment efficiency and outcomes in acute ischemic stroke: a quasi-experimental study. Annals of Medicine, 57(1), 2561793.

4.1a Data Structure and Availability

No feasibility issues have arisen during collection of data for this measure. The Time to Intravenous Thrombolytic Therapy – 60 Minutes measure uses data elements routinely generated and used by healthcare personnel during care delivery, such as arrival time, initiation of IV thrombolytics, and stroke diagnosis. Many of the required data elements are available in defined fields, ensuring structured data collection. For data elements that are not captured in structured fields in the health record, such as patient location when stroke symptoms discovered, and participation in a clinical trial, no issues with data collection have been identified. No modifications have been made to this measure due to data collection or cost. Given the long-standing implementation of the American Heart Association's GWTG®– Stroke program, participating facilities capture these data elements using consistent fields.

GWTG®– Stroke measures run on chart-abstracted data elements. Patient forms have backend logic that requires responses on data elements pertinent to this measure. If pertinent elements are not completed, the user cannot save the form as complete. Thus, missingness of data elements needed to calculate the measures is addressed at the time of data entry.

The American Heart Association maintains an established Data Quality Review program that provides an external, collaborative process to identify and address data quality issues. Participation in this program is optional. This program evaluates data accuracy, consistency, and reliability across participating sites, validates abstraction practices, and supports improvements in inter-rater reliability. These processes enhance the auditability of the data and support the detection and correction of potential inaccuracies, ensuring that measure results accurately

reflect clinical practice. In addition, each site participating in GWTG®– Stroke has a dedicated Quality Improvement Consultant to assist with data abstraction, training, questions, and data review.

4.1b Implementation Costs and Burden

The Time to Intravenous Thrombolytic Therapy – 60 Minutes measure requires manual chart review and abstraction of input data elements for all cases in the measure's initial population in order to calculate the performance score. Chart abstraction requires dedicated staffing and adequate training. The GWTG®– Stroke data collection platform offers an uploader function, which allows sites to batch upload data into patient forms. Sites can extract discrete data fields from electronic medical records, map the data to GWTG®– Stroke data element specifications, and upload the mapped data file into GWTG®– Stroke. Sites can develop this process internally, or with the support of third party GWTG®– Stroke compatible vendors.

As noted in the previous section, the data elements required for this measure are routinely documented during the provision of care. No modification to the clinical workflow is required to document and report this measure, and measure calculation and performance are automated following data entry.

4.1c Confidentiality

This measure can be calculated on the HIPAA-compliant limited data set without the need for direct patient identifiers. Measure calculation does not require information that could disclose protected health information. For performance reporting, data can be aggregated at the facility-level.

4.3 Feasibility Informed Final Measure

Facilities participating in GWTG®– Stroke can choose between third party abstraction, batch upload of data in the GWTG specified format, or hand/manual abstraction. Data is stored in discrete data fields. Occasional transcription errors are identified and mitigated through validation processes. Each method has been demonstrated to be feasible, valid, and reliable over the 20-year history of the platform. Prior to any measure changes being implemented, data elements are tested through User Acceptance Testing. In this test environment, health information technology, registry vendor, and measure development staff test measure performance by creating test cases and ensuring data elements are acting as intended with reliable results before the change is implemented. This testing is similar to structured chart review validation. Additionally, individual sites and state-specific quality improvement advisors provide input if they were to identify data elements not operating as specified, allowing for a real-time feedback loop ensuring continued reliability. These findings support continued use of the measure specifications as written.

4.4 Proprietary Information

Proprietary measure or components (e.g., risk model, codes), without fees

4.4a Fees, Licensing, or Other Requirements

Interested parties must enter a licensing agreement with the American Heart Association in order to use this measure in their programs.

5.1.1 Data Used for Testing

Our analysis used data pulled from participating sites in GWTG®– Stroke. Included data were at the de-identified patient level. Data were abstracted directly from the medical record and entered into the GWTG®– Stroke portal by abstractors from participating facilities.

5.1.1a Dates of Testing Data

Our analysis included data from January 2024 through December 2025.

5.1.2 Differences in Data

Our analysis included 912,661 patients in the initial patient population and 82,089 in the denominator from 1,390 facilities in 2024 and 2025. All analyses except for the review of validity used the same sample. Validity analyses required linkage to a similar quality measure (i.e., Joint Commission STK-4 Thrombolytic Therapy) and this linkage was limited to a subset of 108,630 patients treated at 857 hospitals who reported performance scores for both measures.

5.1.3 Characteristics of Measured Entities

Our data set included all sites participating in GWTG®– Stroke in 2024 and 2025. Our sample was nationally representative, including facilities in all 50 states plus the District of Columbia, Puerto Rico, and Guam. Participating facilities were relatively evenly distributed across geographic regions, with 19.50 percent located in the East and New England, 21.29 percent in the Southeast, 22.01 percent in the Midwest, 11.22 percent in the Southwest, and 18.71 percent in the West. 75.97 percent of hospitals in our analysis were teaching hospitals, and 16.76 percent were non-teaching with the remaining missing data. The majority of hospitals included in our analysis were non-critical access hospitals (92.59 percent) and large with over 100 beds (86.26 percent).

Smaller and Critical Access Hospitals were underrepresented relative to their proportion among all U.S. hospitals. This is consistent with the lower stroke volumes and lower registry participation rates observed in these facilities. Consequently, our findings are most generalizable to hospitals providing the majority of acute stroke care in the United States.

5.1.4 Characteristics of Units of the Eligible Population

Our data set included all ischemic stroke patients aged 18 -110 years who were discharged from sites in GWTG®– Stroke in 2024 and 2025. The median age of included patients was 71 years of age. Patients were concentrated at the higher end of the age range as is expected for ischemic stroke care: 25.94 percent were under 60 years of age, 50.00 percent were between 60 and 79 years of age, and 24.06 percent were older than 80 years of age. Our patients were majority white (71.38 percent), followed by Black (15.64 percent), Asian (3.57 percent) and Hispanic or Latino (3.51 percent). Race was self-reported by patients and was not mutually exclusive; patients could be classified into multiple categories. 52.13 percent of patients were Medicare recipients.

5.2.1 Level(s) of Reliability Testing Conducted

Accountable entity level (i.e., measure score) (e.g., signal-to-noise analysis)

5.2.2 Method(s) of Reliability Testing

We assessed site-level reliability using signal-to-noise analysis. In our analysis, reliability is defined as the proportion of total observed variance attributable to true differences in site performance rather than measurement error. Reliability was calculated by finding the ratio of between-site variance to the sum of between-site variance and site-specific error variance. A reliability of zero indicates that observed variation is entirely attributable to measurement error. A reliability of one indicates that all variation reflects true differences in site performance.

5.2.3 Reliability Testing Results

Our findings demonstrate high facility-level reliability for the measure, with an overall reliability score of 0.89, indicating strong suitability for performance comparisons across facilities. As shown in Table 2a *Reliability by Denominator Decile, Facility Level, 2024-2025*, reliability increases with facility denominator size. Facilities in the smallest denominator decile achieved an acceptable reliability score of 0.76, while the largest facilities attained reliability values as high as 0.98. As shown in Table 2b *Reliability by Decile, Facility Level, 2025-2025*, the mean reliability within our lowest decile reliability decile was 0.66, while the next decile rose to 0.76 and continued to improve substantially across deciles. Thus, low reliability was confined to a small subset of facilities.

5.2.4 Interpretation of Reliability Results

These results indicate that the Time to Intravenous Thrombolytics – 60 Minutes measure reliably differentiates performance across facilities of varying sizes, including those with lower patient volumes. Reliability was found to increase with facility denominator size. Our findings indicate higher statistical noise in a small, contained proportion of entities. However, the majority of entities demonstrated reliability at or above acceptable thresholds.

In addition, data quality and reliability are supported by established practices at the American Heart Association. The American Heart Association maintains a formal Data Quality Review

program that provides an external, collaborative process to evaluate data accuracy, consistency, and abstraction practices across participating sites, supporting improvements in inter-rater reliability. Standardized measure specifications and coding instructions are provided to participating facilities to promote consistent data capture and reproducibility. Together, these processes support confidence that measure results accurately reflect clinical practice.

Table 2a. Accountable Entity Level Reliability Testing Results by Denominator, Target Population Size

Table 2a: Reliability by Denominator Decile, Facility Level, 2024-2025

	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Reliability	0.89	0.74	0.76	0.80	0.84	0.87	0.90	0.92	0.94	0.95	0.97	0.98	1
Mean Performance Score	89.18	80.13	81.83	84.18	84.86	87.53	89.02	89.69	91.59	93.01	94.31	95.73	99.38
Number of Entities	1,390	39	139	139	139	139	139	139	139	139	139	139	1
Number of Persons / Encounters / Episodes	82,089	780	2,965	3,537	4,200	5,084	6,014	7,037	8,303	10,244	13,215	21,490	321

Table 2b. Accountable Entity Level Reliability Testing Results by Reliability Score

Table 2b: Reliability by Decile, Facility Level, 2024-2025

	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Reliability	0.89	0.56	0.66	0.76	0.83	0.88	0.92	0.95	0.97	0.98	1.00	1.00	1.00

5.3.1 Level(s) of Validity Testing Conducted

Accountable entity level (i.e., measure score) (e.g., criterion validity)

5.3.2 Type of Accountable Entity Level Validity Testing Conducted

Empirical validity testing at the accountable entity-level (e.g., criterion validity, construct validity, known groups analysis)

5.3.3 Method(s) of Validity Testing

Our team conducted convergent construct validity testing by comparing the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure to STK-4 Thrombolytic Therapy from Joint Commission. STK-4 Thrombolytic Therapy assesses the receipt of IV thrombolytics within three hours for patients who arrive within two hours of time last known well. Time to Intravenous Thrombolytic Therapy- 60 Minutes looks at the receipt of IV thrombolytic therapy within one hour of arrival, or the door-to-needle time.

We used Spearman’s correlation coefficient to compare measure scores between the two

measures at each facility in our data set. STK-4 Thrombolytic Therapy has been demonstrated to be valid and reliable. The two measures are theoretically related in their shared capture of hospital processes influencing door-to-needle times. These processes include emergency department workflows, stroke team activation, imaging, and treatment decisions. However, STK-4 measure performance is also influenced by prehospital factors such as time to symptom recognition and emergency response.

Consistent with this framework, we hypothesize a Spearman's correlation of 0.50, indicative of a moderate, positive relationship between the two measures. As facility performance improves on the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure, facility scores are anticipated to improve on STK-4 due to the overlap of factors dictating door-to-needle time.

5.3.4 Validity Testing Results

Using data from January 2024 through December 2025, our analysis resulted in a Spearman's correlation coefficient of 0.39 ($p<0.05$). This result indicated that facilities with better performance on the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure tended to achieve better performance on the STK-4 Thrombolytic Therapy measure.

5.3.5 Interpretation of Validity Results

Our analysis resulted in a Spearman's correlation coefficient of 0.39, indicating that facilities with better performance on the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure tended to achieve better performance on the STK-4 Thrombolytic Therapy measure.

The observed direction is consistent with the hypothesized relationship between the two measures, with a magnitude indicative of distinct but related constructs.

Notably, this analysis was conducted without exclusion of outliers, preserving real world performance variation across facilities. Because STK-4 reflects both prehospital and in-hospital factors influencing time to treatment, whereas the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure isolates hospital based processes, the retention of outliers may explain the slightly lower magnitude of the correlation coefficient than hypothesized. The lower magnitude than anticipated is consistent with real-world data.

Overall, the results support the convergent validity of the Time to Intravenous Thrombolytic Therapy – 60 Minutes measure, demonstrating alignment with other accepted stroke quality measures.

5.4.1 Methods Used to Address Risk Factors

No risk adjustment or stratification

6.1.1 Current Status

In use

6.1.2 Current or Planned Use(s)

Professional Certification or Recognition Program

6.1.3 Program Details

Name of the program and sponsor
American Heart Association Get With the Guidelines®– Stroke
URL of the program
https://www.heart.org/en/professional/quality-improvement/get-with-the-guidelin...
Purpose of the program

Get With The Guidelines®– Stroke is an in-hospital program for improving stroke care by promoting consistent adherence to the latest scientific treatment guidelines. Numerous published studies demonstrate the program's success in achieving measurable patient outcome improvements.

Geographic area and percentage of accountable entities and patients included

Get With The Guidelines®–Stroke is a nationally representative quality improvement program. The program currently partners with 2,000 hospitals, or approximately 30 percent of hospitals in the United States, and has included over 5 million patient records.

For the Time to Intravenous Thrombolytic Therapy measure, the analytic dataset used for re-endorsement analytics includes hospitals across all 50 states, as well as the District of Columbia, Puerto Rico, and Guam. The analytic dataset encompasses approximately 1,300 accountable entities and 860,000 patients.

Applicable level of analysis and care setting

Hospital-level; hospital-inpatient

6.1.4 Attributes for Accountability Use

The Time to Intravenous Therapy - 60 Minutes measure is best suited for use among adult patients ages 18 years of age and older admitted to an inpatient facility. This measure is intended for use at hospitals and is not intended to be risk adjusted at the measure or the payment level.

6.2.1 Actions of Measured Entities to Improve Performance

Timeline-based protocols have been shown to improve clinical outcomes in ischemic stroke patients (Xiao et al., 2025). Implementing timeline-based management protocols promotes the precise tracking of clinical milestones and prioritization of parallel processing rather than

sequential steps, allowing teams to perform assessments and testing simultaneously (Xiao et al., 2025). While such protocols require interdepartmental agreement and infrastructure set-up, most facilities can implement these protocols without major financial investment. Utilizing "direct-to-CT" pathways enables patients to bypass the emergency department triage, with some protocols demonstrating the efficacy of administering thrombolytics directly on the CT scanner (Madhok et al., 2019). For these interventions, CT availability is the biggest resource constraint for most hospitals. Hospitals can modify operational workflows to improve door-to-needle times, starting with emergency medical services (EMS) pre-notification and pre-arrival activation of a multidisciplinary stroke team or more generally, the coordination of in-hospital and out-of-hospital interventions (Zhou et al., 2025; Prabhakaran et al., 2026; Sharobeam et al., 2021) While this may be a relatively simple intervention for some facilities, there is substantial variability among EMS-hospital relationships. Structural modifications, such as employing dedicated stroke coordinators and achieving stroke center certification, have been shown to increase the odds of achieving door-to-needle benchmarks, such as administration of IV thrombolytics within 60 minutes (Srinivasan et al., 2024; Prabhakaran et al., 2026). Integrating dedicated stroke nurses into the inter-professional team further expedites treatment times and is significantly associated with improved functional outcomes (Kumar et al., 2025). Additionally, the use of regional dashboards and participation in stroke coalitions foster better adherence to quality indicators (Del Brutto et al., 2025; Prabhakaran et al., 2026). Finally, institutional commitments to continuous staff education and simulation training are essential to sustaining these performance gains and ensuring equitable access to care (Puri et al., 2019; Kumar et al., 2025). These final commitments may require a substantial and recurrent financial and administrative commitment on the part of the facility.

References

Del Brutto, V. J., Gutierrez, C. M., Ying, H., Gardener, H., Veledar, E., Jameson, A., ... & Romano, J. G. (2025). Enhancing thrombolysis times in acute ischemic stroke with regional dashboards: Results from the Florida Stroke Registry. Journal of the American Heart Association, 14(14), e040611.

Kumar, A., Kumar, M., Verma, P., Pal, R., Nagi, M., Mahesh, K. V., ... & Khurana, D. (2025). Effects of stroke nurse-led acute stroke management on treatment time benchmarks, intravenous thrombolysis rates, and patient outcomes: A systematic review and meta-analysis. Journal of Stroke and Cerebrovascular Diseases, 34(3), 108216.

Madhok, D. Y., Keenan, K. J., Cole, S. B., Martin, C., & Hemphill 3rd, J. C. (2019). Prehospital and emergency department-focused mission protocol improves thrombolysis metrics for suspected acute stroke patients. Journal of Stroke and Cerebrovascular Diseases, 28(12), 104423.

Prabhakaran, S., Gonzalez, N. R., Zachrison, K. S., Adeoye, O., Alexandrov, A. W., Ansari, S. A., ... & Yaghi, S. (2026). 2026 Guideline for the early management of patients with acute ischemic stroke: A guideline from the American Heart Association/American Stroke Association. Stroke, 57.

Puri, I., Bhatia, R., Vibha, D., Singh, M. B., Padma, M. V., Aggarwal, P., & Prasad, K. (2019).

Stroke-related education to emergency department staff: An acute stroke care quality improvement initiative. Neurology India, 67(1), 129–133.

Sharobeam, A., Jones, B., Walton-Sonda, D., & Lueck, C. J. (2021). Factors delaying intravenous thrombolytic therapy in acute ischaemic stroke: a systematic review of the literature. Journal of Neurology, 268(8), 2723–2734.

Srinivasan, M., Scott, A., Soo, J., Sreedhara, M., Popat, S., Beasley, K. L., … & Ahn, R. (2024). The role of stroke care infrastructure on the effectiveness of a hub-and-spoke telestroke model in South Carolina. Journal of Stroke and Cerebrovascular Diseases, 33(6), 107702. (Available in PMC June 1, 2025).

Xiao, A. F., Li, Y. F., Feng, G. Q., Ao, Y. P., Gu, B., Wang, J., & You, J. Q. (2025). Impact of timeline-based management on treatment efficiency and outcomes in acute ischemic stroke: a quasi-experimental study. Annals of Medicine, 57(1), 2561793.

Zhou, H., Wen, Y., Qu, J., Dai, M., Li, S., Wan, W., & Chen, Y. (2025). Impact of emergency stroke green channel implementation on door-to-needle time and 90-day outcomes in acute ischemic stroke patients. World Neurosurgery, 202, 124392.

6.2.2 Feedback on Measure Performance

As part of ongoing measure maintenance, the measure is systematically reviewed against the most current clinical practice guidelines and emerging evidence. Reviews assess whether the measure construct remains appropriate for the target population and whether denominator and exclusion criteria accurately reflect patients for whom the measured care process is clinically indicated.

6.2.3 Consideration of Measure Feedback

Measure updates are implemented when changes in evidence, clinical workflows, or standards of practice warrant refinement. For example, the measure was revised to exclude patients transferred from another facility, recognizing that these cases may not reflect the performance of the receiving hospital’s in-facility stroke care processes.

6.2.4 Progress on Improvement

Facilities have improved performance scores on Time to Intravenous Thrombolytic – 60 Minutes over the past decade. In 2015, 73.5 percent of 353,838 patients in the GWTG®– Stroke registry met the Numerator criteria across 1,580 sites. In 2026, 90.3 percent of 580,270 patients met the measure’s Numerator criteria across 2,625 sites. These performance scores are nationally representative. However, as demonstrated in previous sections, gaps in care remain. Thus, the measure is of continued importance for quality improvement initiatives.

6.2.5 Unexpected Findings

There have not been unexpected findings in the implementation of this measure.

Developer POC email

sera.gearhart@heart.org

Measure Developer POC

Sera Gearhart
https://www.heart.org/
Dallas, TX
United States

The measure developer is different from the measure steward

No

Steward Address

Sera Gearhart
Dallas, TX
United States

Steward Organization

American Heart Association

Steward Organization URL

https://www.heart.org/

Steward POC email

sera.gearhart@heart.org