



## Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to sub criterion 1b).

### Brief Measure Information

**NQF #:** 0437:3044

**Corresponding Measures:** 0437:2834

**De.2. Measure Title:** STK 04: Thrombolytic Therapy

**Co.1.1. Measure Steward:** The Joint Commission

**De.3. Brief Description of Measure:** This measure captures the proportion of acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well for whom IV t-PA was initiated at this hospital within 3 hours of time last known well. This measure is a part of a set of eight nationally implemented measures that address stroke care (STK-1: Venous Thromboembolism (VTE) Prophylaxis, STK-2: Discharged on Antithrombotic Therapy, STK-3: Anticoagulation Therapy for Atrial Fibrillation/Flutter, STK-5: Antithrombotic Therapy By End of Hospital Day 2, STK-6 Discharged on Statin Medication, STK-8: Stroke Education, and STK-10: Assessed for Rehabilitation) that are used in The Joint Commission's hospital accreditation and Disease-Specific Care certification programs. This measure captures the proportion of acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

This measure is a part of a set of eight nationally implemented measures that address stroke care (STK-1: Venous Thromboembolism (VTE) Prophylaxis, STK-2: Discharged on Antithrombotic Therapy, STK-3: Anticoagulation Therapy for Atrial Fibrillation/Flutter, STK-5: Antithrombotic Therapy By End of Hospital Day 2, STK-6 Discharged on Statin Medication, STK-8: Stroke Education, and STK-10: Assessed for Rehabilitation) that are used in The Joint Commission's Disease-Specific Care stroke certification programs.

**1b.1. Developer Rationale:** Stroke is the fourth leading cause of death in the United States and a leading cause of serious, long-term disability, associated with significant costs. Studies have demonstrated that the early administration of thrombolytic therapy within 3 hours of stroke symptom onset can significantly improve neurologic outcomes at 3 months in patients with ischemic stroke. The European Cooperative Acute Stroke Study (ECASS) III trial indicated that intravenous rtPA can be given safely to, and can improve outcomes for, carefully selected patients treated 3 to 4.5 hours after stroke; however, as the NINDS investigators concluded, the earlier that IV thrombolytic therapy is initiated, the better the patient outcome. Despite strong recommendations from the American Academy of Neurology, the American Heart Association, and the American College of Chest Surgeons, thrombolytic therapy is used in only a small proportion of ischemic stroke patients overall and in only a minority of eligible candidates.

Healthcare organizations that track IV thrombolytic administration for internal quality improvement purposes have seen a significant increase in the measure rate over time. This measure has been included in the CMS Hospital Inpatient Quality Reporting Program for three years (i.e., FY 2015, FY 2016, FY 2017) to promote improvements in quality at the national level.

**S.4. Numerator Statement:** Acute ischemic stroke patients for whom IV thrombolytic therapy was initiated at this hospital within 3 hours (less than or equal to 180 minutes) of time last known well.

**S.6. Denominator Statement:** Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

**S.8. Denominator Exclusions:**

- Less than 18 years of age

- Length of Stay > 120 days
- Enrolled in clinical trials related to stroke
- Admitted for elective carotid intervention
- Time last known well to arrival in the emergency department greater than 2 hours
- Documented reason for extending the initiation of IV thrombolytic
- Documented reason for not initiating IV thrombolytic

**De.1. Measure Type:** Process

S.17. Data Source: [Electronic Health Record \(Only\)](#), [Paper Records](#)  
S.20. Level of Analysis: [Facility](#), [Other](#)

IF Endorsement Maintenance – Original Endorsement Date: [Jul 31, 2008](#) Most Recent Endorsement Date: [Sep 23, 2016](#)

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? [Not Applicable](#)

## 1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. **Measures must be judged to meet all sub criteria to pass this criterion and be evaluated against the remaining criteria.**

**1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form**  
[0437\\_Evidence\\_MSFS.0\\_Data.doc](#)

**1a.1 For Maintenance of Endorsement: Is there new evidence about the measure since the last update/submission?**

Please update any changes in the evidence attachment in red. Do not remove any existing information. If there have been any changes to evidence, the Committee will consider the new evidence. If there is no new evidence, no updating of the evidence information is needed.

### 1b. Performance Gap

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- Disparities in care across population groups.

**1b.1. Briefly explain the rationale for this measure** (e.g., how the measure will improve the quality of care, the benefits or improvements in quality envisioned by use of this measure)

*IF a PRO-PM (e.g. HRQoL/functional status, symptom/burden, experience with care, health-related behaviors), provide evidence that the target population values the measured PRO and finds it meaningful. (Describe how and from whom their input was obtained.)*

*IF a COMPOSITE (e.g., combination of component measure scores, all-or-none, any-or-none), SKIP this question and provide rationale for composite in question 1c.3 on the composite tab.*

Stroke is the fourth leading cause of death in the United States and a leading cause of serious, long-term disability, associated with significant costs. Studies have demonstrated that the early administration of thrombolytic therapy within 3 hours of stroke symptom onset can significantly improve neurologic outcomes at 3 months in patients with ischemic stroke. The European Cooperative Acute Stroke Study (ECASS) III trial indicated that intravenous rtPA can be given safely to, and can improve outcomes for, carefully selected patients treated 3 to 4.5 hours after stroke; however, as the NINDS investigators concluded, the earlier that IV thrombolytic therapy is initiated, the better the patient outcome. Despite strong recommendations from the American Academy of Neurology, the American Heart Association, and the American College of Chest Surgeons, thrombolytic therapy is used in only a small proportion of ischemic stroke patients overall and in only a minority of eligible candidates.

Healthcare organizations that track IV thrombolytic administration for internal quality improvement purposes have seen a significant increase in the measure rate over time. This measure has been included in the CMS Hospital Inpatient Quality Reporting Program for three years (i.e., FY 2015, FY 2016, FY 2017) to promote improvements in quality at the national level.

**1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis.** (*This is required for maintenance of endorsement. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.*)  
*This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.*

[Many patients with acute ischemic stroke arrive at the hospital within three hours of stroke onset without documented](#)

contraindications who still do not receive intravenous (IV) thrombolysis (t-PA). Although rates of IV t-PA administration have improved over time, there is still less than optimal performance especially in the lower quartile and decile of hospitals. In October, 2009, The Joint Commission added the stroke (STK) measure set as a new core measure option to meet performance measure requirements for Joint Commission hospital accreditation purposes. Joint Commission ORYX performance measure data for 4Q 2009 yielded an average measure rate of 48.9% from 39 hospitals collecting data for this measure (n=233 patients). The average rate for all hospitals collecting data for this measure (i.e., 1099 hospitals; n=14,907 patients) is currently 84.5%, indicating that a potential performance gap of 15% persists if the optimal rate is 100%. Below is the specified level of analysis for STK-4 beginning with discharges 4Q 2009 through December 31, 2014.

4Q 2009: 233 denominator cases; 114 numerator cases; 39 hospitals; 0.48927 national aggregate rate; 0.54417 mean of hospital rates; 0.41298 standard deviation; 1.0 90th percentile rate; 1.0 75th percentile rate/upper quartile; 0.625 50th percentile rate/median rate; 0.03704 25th percentile rate/lower quartile; and, zero 10th percentile rate.

CY 2010: 1728 denominator cases; 1053 numerator cases; 129 hospitals; 0.60938 national aggregate rate; 0.56977 mean of hospital rates; 0.37503 standard deviation; 1.0 90th percentile rate; 0.9 75th percentile rate/upper quartile; 0.66667 50th percentile rate/median rate; 0.21212 25th percentile rate/lower quartile; and, zero 10th percentile rate.

CY 2011: 1942 denominator cases; 1333 numerator cases; 136 hospitals; 0.68641 national aggregate rate; 0.57338 mean of hospital rates; 0.37267 standard deviation; 1.0 90th percentile rate; 0.89737 75th percentile rate/upper quartile; 0.71964 50th percentile rate/median rate; 0.23611 25th percentile rate/lower quartile; and, zero 10th percentile rate.

CY 2012: 1807 denominator cases; 1393 numerator cases; 136 hospitals; 0.77089 national aggregate rate; 0.67283 mean of hospital rates; 0.34402 standard deviation; 1.0 90th percentile rate; 1.0 75th percentile rate/upper quartile; 0.7735 50th percentile rate/median rate; 0.5 25th percentile rate/lower quartile; and, zero 10th percentile rate.

CY 2013: 3135 denominator cases; 2493 numerator cases; 224 hospitals; 0.79522 national aggregate rate; 0.74944 mean of hospital rates; 0.3186 standard deviation; 1.0 90th percentile rate; 1.0 75th percentile rate/upper quartile; 0.875 50th percentile rate/median rate; 0.66667 25th percentile rate/lower quartile; and, zero 10th percentile rate.

CY 2014: 14,907 denominator cases; 12,598 numerator cases; 1099 hospitals; 0.84511 national aggregate rate; 0.75482 mean of hospital rates; 0.32814 standard deviation; 1.0 90th percentile rate; 1.0 75th percentile rate/upper quartile; 0.88889 50th percentile rate/median rate; 0.66667 25th percentile rate/lower quartile; and, zero 10th percentile rate.

**1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.**

Not applicable.

**1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.** *(This is required for maintenance of endorsement. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included.) For measures that show high levels of performance, i.e., "topped out", disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.*

Not applicable.

**1b.5. If no or limited data on disparities from the measure as specified is reported in 1b.4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations. Not necessary if performance data provided in 1b.4**

Since the last endorsement period, several large studies have evaluated trends in thrombolysis utilization across the United States. While disparities still exist for many groups, the disparity gap has narrowed for certain groups, e.g., older adults, young adults, women, and young blacks, since the last submission.

George and colleagues (2015) analyzed discharge data from 2005 to 2010 in the Nationwide Inpatient Sample (NIS) of the Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (Rockville, MD). This analysis identified persistent

racial disparities for blacks and Hispanics consistent with those found previously for blacks and Hispanics (Kimball, et al. 2012), as well as, a trend to treat older adults who would not have been considered t-PA candidates in earlier years and increased utilization rates for rural patients. From this database, 512,429 older adults (> 65 years of age) with acute ischemic stroke who received an injection or infusion of a thrombolytic agent were identified and divided into three age groupings (65-74, 75-84, > 85 years). Among U.S. hospitals with acute stroke patients, there were an estimated 1462 hospitals (32%) administering thrombolysis in 2005 and 1884 hospitals (43%) in 2010 (trend  $P = 0.003$ ). For older adult stroke admissions, the rate of thrombolysis increased from 1.7% (95% CI: 1.6-1.8%) in 2005 to 5.4% (95% CI: 5.2-5.6%) in 2010, representing a three-fold increase in thrombolysis rates for older adults (trend  $P < 0.001$ ). The largest increases occurred for individuals > 85 years of age with an approximate four-fold rate increase from 2005 to 2010. Rates of administration increased three-fold for urban patients and urban hospitals. Thrombolysis rates also increased for rural patients (0.9% in 2005 vs. 3.3% in 2010; trend  $P < 0.001$ ), and rural hospitals increased at a slower rate (0.5% in 2005 vs. 1.7% in 2010; trend  $P < 0.001$ ). Low volume hospitals increased their rates of thrombolysis in older adults to a lesser degree than higher volume centers.

A second study using discharge data obtained from the Nationwide Inpatient Sample between 2001 and 2009 reported that disparities for young blacks has significantly improved in recent years (Kansara, et al. 2013). Between 2001 and 2009, there were an estimated 4,917, 217 admissions for acute ischemic stroke. Of these, 204,703 (4.16%) were young patients with a mean age approximately 37 years. The use of thrombolysis for young acute ischemic stroke patients increased 270% during this time period. The increased rate was noted across all races, including white, black, and nonwhite/nonblack populations. Unlike previous studies that reported that black patients were less likely to receive thrombolysis, this study found that a greater percentage of young black patients with acute ischemic stroke (5.45%) received thrombolysis than young white patients with acute ischemic stroke (4.57%) in 2009.

A univariate analysis of more than one million ( $N=1,093,895$ ) acute ischemic stroke patients from 1683 hospitals participating in the American Heart Association's Get With the Guidelines-Stroke database was conducted to evaluate changes in the patterns of IV t-PA use over the 9-year period from April 2003 to December 2011. IV thrombolytic use has changed over time with a broader range of patients treated in later years. According to this analysis, the proportion of patients age > 85 years treated with IV t-PA increased from 10.5% in 2003-2005 to 16.4% in 2010-2011 ( $P<0.001$ ). Also, the gender distribution of t-PA use changed slightly, with the proportion of t-PA use among women increasing from 48.6% to 51%. The population receiving t-PA also became more diverse, with nonwhites accounting for 21.1% of t-PA use in 2003 to 2005 but 28.9% in 2010 to 2011 ( $P<0.001$ ) (Schwamm, et al. 2013). This study is among the first to describe the temporal trends of the past decade in IV t-PA use in patients with acute ischemic stroke in a clinically derived dataset from a sizeable cohort of U.S. hospitals nationwide.

Another published study utilized the American Heart Association's Get With the Guidelines-Stroke registry linked with Medicare claims data set to examine whether 30-day and 1-year outcomes differed by race/ethnicity among older patients with acute ischemic stroke (Qian, et al., 2013). Compared with other race/ethnicity groups, non-Hispanic black patients were less likely to receive IV t-PA in less than 3 hours from stroke onset. Relative to whites, black and Hispanic patients had higher adjusted 1-year all-cause rehospitalization (black: adjusted odds ratio, 1.28 [95% CI, 1.21-1.37]; Hispanics: adjusted odds ratio 1.22 [95% CI, 1.11-1.35]. Non-Hispanic black patients were more likely to be treated at high-volume and academic hospitals, which were generally located in the south. These findings were based on an analysis of 200,900 patients, including 20514 non-Hispanic blacks (10.2%), with acute ischemic stroke greater than 65 years of age from 926 U.S. centers participating in the GWTG-Stroke program from April 2003 through December 2008.

A prior 2011 report from the American Heart Association/American Stroke Association reported that racial disparities in stroke care exist and are more predominant among people < 65 years of age. Evidence of disparities in stroke care between minority groups and whites include: lack of knowledge about the risk factors for stroke; lack of awareness about stroke signs and symptoms and the need for urgent treatment; and, access to care respecting prevention services, acute stroke treatment, and rehabilitation. Differences in care are also related to the socioeconomic status of minorities, insurance coverage, cultural beliefs and attitudes, language barriers, immigration status, mistrust of the healthcare system, and the number of providers representing minority groups. These are all factors contributing to the quality of stroke care (Cruz-Flores, et al. 2011).

Each year in the United States, ~ 55,000 more women than men have a stroke. Statistics reveal that women have a higher "life-time risk of stroke" than men. (Mozaffarian D, et al., 2015). In the Framingham Heart Study, lifetime risk of stroke among those 55 to 75 years of age was 1 in 5 for women (20% to 21%) and ~1 in 6 for men (14% to 17%).

As stated in the previous submission citing earlier studies, the burden of stroke is higher in Blacks or African Americans and Hispanics

than whites. Racial and ethnic minorities have excess deaths from stroke and also experience greater years of potential life lost than non-Hispanic whites. The risk ratio for stroke mortality in all racial and ethnic minorities is higher in the 35-to-64-year-old age group, however, this risk decreases as people age. After age 64 non-Hispanic whites have an equal risk for stroke when compared to Hispanics and American Indian-Alaskan Natives. This equalization of rate of stroke presents again after age 85 in blacks or African Americans (Cruz-Flores, et al., 2011).

In the national REGARDS cohort, 27,744 black and white men and women, aged > 45 years, followed over 4.4 years, and stroke-free at baseline, reported an overall age-adjusted and sex-adjusted black/white incidence rate ratio of 1.51. At ages 45 to 54 years, the rate ratio increased to 4.02 compared to 0.86 for > 85 years. A higher incidence of stroke is reported for blacks at younger ages.

The REGARDS investigators found that approximately half of racial disparity in stroke risk is attributable to traditional risk factors (primarily systolic blood pressure) and socioeconomic factors (Howard, et al., 2011). Brown and colleagues (2011) found a higher incidence of ischemic stroke in disadvantaged white neighborhoods, but found no significant associations between neighborhood socioeconomic status and ischemic stroke among blacks. A recent large population-based Canadian study examined gender-adjusted, age-adjusted prevalence of cardiovascular risk factors, heart disease and stroke in four ethnic groups: white (n=154,653); South Asian (N=3364); Chinese (n=3038); and, blacks (n=2742). Stroke incidence was highest in the South Asian group (1.7%) and lowest in the Chinese population (0.6%). The increased risk in the South Asian population was attributed to high susceptibility to insulin resistance and metabolic syndrome, and a tendency to develop diabetes mellitus at younger ages in both men and women as compared to other ethnic groups (Chiu, et al., 2010).

The BASIC (Brain Attack Surveillance in Corpus Christi) project (NINDS) demonstrated an increased incidence of stroke among Mexican Americans compared with non-Hispanic whites in a community in southeast Texas. The crude 3-year cumulative incidence (2000-2003) was 16.8 per 1000 in Mexican Americans and 13.6 per 1000 in non-Hispanic whites. Specifically, Mexican Americans had a higher cumulative incidence for ischemic stroke at younger ages (45-59 years of age: RR 2.04, 95% CI 1.55-2.69; 60-74 years of age: RR 1.58, 95% CI 1.31-1.91) but not at older ages (> 75 years of age : RR 1.12, 95% CI 0.94-1.32). Mexican Americans also had a higher incidence of intracerebral hemorrhage and subarachnoid hemorrhage than non-Hispanic whites, adjusted for age.

Temporal trend data from the BASIC Project for the time period 2000 through 2010 demonstrated that ischemic stroke rates declined significantly in people aged =60 years but remained largely unchanged over time in those aged 45 to 59 years. Rates of decline did not differ significantly for non-Hispanic whites and Mexican Americans in any age group. Therefore, ethnic disparities in stroke rates in the 45- to 59-year-old and 60- to 74-year-old age groups persist (Morgenstern, et al., 2013).

Data from the most recent Greater Cincinnati Northern Kentucky Stroke Study (GCNKSS) show that compared with the 1990s, when incidence rates of stroke were stable, stroke incidence in 2005 was decreased for whites. A similar decline was not seen in blacks. These changes for whites were driven by a decline in ischemic strokes. There were no changes in incidence of ischemic stroke for blacks or of hemorrhagic strokes in blacks or whites (Kleindorfer, et al., 2010). In an analysis of temporal trends in ischemic stroke incidence stratified by age, the GCNKSS found an increased incidence of ischemic stroke over time for both blacks and whites aged 20 to 54 years, especially in 2005 compared with earlier time periods. There were declining incidence rates in the oldest age groups for both race groups (Kissela, et al., 2012).

Minorities are less likely to use emergency medical services and more likely to wait longer before going to the hospital than are non-Hispanic whites. After hospital arrival, blacks or African Americans and possibly Hispanics experience longer wait times in the emergency department which results in treatment delays that include administration of thrombolytic therapy. Although unmeasured factors may play a role in these delays, the presence of bias in the delivery of care cannot be excluded (Cruz-Flores, et al, 2011).

The Department of Neurology and Stroke Program, Wayne State University School of Medicine, Detroit, MI (Bhattacharya P, et al., 2011) explored racial differences in the delivery of care to patients with acute stroke between hospitals certified in primary stroke care by The Joint Commission and noncertified hospitals. A retrospective chart review of 574 patients (25.1% African American) with ischemic stroke admitted to five Joint Commission certified primary stroke centers and five non-certified hospitals was conducted. Similar to previous studies, Bhattacharya found that African Americans often did not receive intravenous tPA because of a delay in hospital arrival. Whites were more likely to arrive by emergency transport services (65.5% vs 51.1%; P= 0.004) to be evaluated by a stroke team (19.1% vs. 7.7%; P=0.001), and to have documented National Institutes of Health Stroke Scale (NIHSS) score (40.2% vs. 29/9%; P=0.03); however, the number of white and black patients who received IV t-PA was not statistically different (2.1% in

African Americans, 3.5% in Caucasians; P=0.40).

A larger study of 1044 patients (74% African American, 19% non-Hispanic white) with ischemic stroke (Hsia AW, et al., 2011), found that blacks were one-third less likely than whites to receive IV t-PA (3% vs.10%, P<0.001). Blacks were less likely than whites to present in 3 hours of symptom onset (13% vs. 21%; P=0.004). They were also less likely to be eligible candidates for thrombolytic therapy (5% vs. 13%; P<0.001). Of those patients who presented in 3 hours, blacks were almost half as likely to be treated with IV t-PA when compared to whites (27% vs. 46%; P=0.023).

A recent study from the Mayo Clinic, Rochester, MN (Naser DM, et al., 2011) investigated possible racial and ethnic disparities in the administration and outcome of recombinant tissue plasminogen activator (rt-PA) therapy for acute ischemic stroke in whites, blacks, Hispanics, and Asian/Pacific Islanders. Patients with a primary diagnosis of acute ischemic stroke who received rt-PA were identified using data from the National Inpatient Sample for 2001-2008 and stratified by race. The investigators analyzed the association of patient race on rt-PA utilization rate, in-hospital morbidity (i.e., discharges to a long-term care facility), intracranial hemorrhage (ICH) rate, and in-hospital mortality. Multivariate logistic regression analysis was performed to identify independent predictors of poor outcomes. Naser and colleagues concluded that whites had a higher rate of t-PA utilization than black and Hispanic patients (2.3% vs. 2.2% P= 0.07), although not statistically significant. Multivariate analysis of morbidity, mortality and ICH rates found that Asian/Pacific Islanders had significantly higher rates of mortality (odds ratio, 1.22, 95% CI, 1.91-2.11; P < .0001) compared with whites. Thrombolytic utilization was greater in white and Asian/Pacific Islander patients than in black and Hispanic patients. Asian/Pacific Islander race was associated with increased risk of ICH and mortality and rt-PA administration.

- Bhattacharya P, Mada F, Salowich-Palm L, et al. Department of neurology and Stroke Program, Wayne State University School of Medicine, Detroit, Michigan. Are racial disparities in stroke care still prevalent in certified stroke centers? J Stroke Cerebrovasc Dis. 2011.
- Brown AF, Liang LJ, Vassar SD, et al. Department of Neurology, UCLA GIM&HSR. Neighborhood disadvantage and ischemic stroke: the Cardiovascular Health Study (CHS). Stroke. 2011;42(12): 3363-8.
- Chiu M, Austin PC, Manuel DG, Tu JV. Comparison of cardiovascular risk profiles among ethnic groups using population health surveys between 1996 and 2007. CMAJ. 2010;182(8):E301-10.
- Cruz-Flores S, Rabinstein A, Biller J, Elkind MSV, et al, on behalf of the American Heart Association Stroke Council, Council on Cardiovascular Nursing, Council on Epidemiology and Prevention, and Council on Quality of Care and Outcomes Research. Racial-ethnic disparities in stroke care: the American experience. Stroke. 2011;42:2091-2116.
- George BP, Asemota AO, Dorsey ER, Haider AH, Smart BJ, Urrutia VC, Schneider EB. United States trends in thrombolysis for older adults with acute ischemic stroke. Clinical Neurology and Neurosurgery. 2015;139:16-23.
- Gillum RF, Kwagyan J, Obisesan TO. Division of Geriatrics, Howard University College of Medicine, Washington, DC, USA. Ethnic and geographic variation in stroke mortality trends. Stroke. 2011;42(11):3294-6.
- Howard G, Cushman M, Kissela BM, Kleindorfer DO, McClure LA, Safford MM, Rhodes JD, Soliman EZ, Moy CS, Judd SE, Howard VJ; REasons for Geographic and Racial Differences in Stroke (REGARDS) Investigators. Traditional risk factors as the underlying cause of racial disparities in stroke: lessons from the half-full (empty?) glass. Stroke. 2011;(12):3369-75.
- Howard G, Howard VJ; Reasons for Geographic and Racial Differences in Stroke (REGARDS) Investigators. Ethnic disparities in stroke: the scope of the problem. Ethn Dis. 2001;11:761-768.
- Hsia AW, Edwards DF, Morgenstern LB, et al. Racial disparities in tissue plasminogen activator treatment rate for stroke: a population-based study. Stroke. 2011;42(8):2217-21.
- Jacobs BS, Birbeck G, Mullard AJ, Hickenbottom S, Kothari R, Roberts S, Reeves MJ. Quality of hospital care in African Americans and white patients with ischemic stroke and TIA. Neurology.2006;66:809-14.
- Johnston SC, Fung LH, Gillum LA, Smith WS, Brass LM, Lichtman JH, Brown AN. Utilization of intravenous tissue-type plasminogen activator for ischemic stroke at academic medical centers.: the influence of ethnicity. Stroke. 2001; 32:1061-68.
- Kansara A, Chaturvedi S, Bhattacharya P. Thrombolysis and outcome of young stroke patients over the last decade: insights from the nationwide inpatient sample. J. Stroke Cerebrovasc Dis. 2013;6:799-804.
- Karve S, Balkrishnan R, Seiber E, Nahata M, Levine DA. Department of health Economics, RTI Health Solutions, Research Triangle Park, North Carolina. Population trends and disparities in outpatient utilization of neurologists for ischemic stroke. J Stroke Cerebrovasc Dis. 2011.
- Morris DL, Rosamond W, Madden K, Schultz C, Hamilton S. Pre-hospital and emergency department delay after acute stroke: the Genetech Stroke Presentation Survey. Stroke. 2000;31:2585-90.
- Kimball MM, Neal D, Waters MF, Hoh BL, Race and income disparity in ischemic stroke care: nationwide inpatient sample database, 2002-2008. Cerebrovasc Dis. 2012.
- Kissela BM, Khoury JC, Alwell K, et al. Age at stroke: temporal trends in stroke incidence in a large, biracial population. Neurology.

2012;79:1781–1787.

• Kleindorfer DO, Khoury J, Moomaw CJ, et al. Stroke incidence is decreasing in whites but not in blacks: a population-based estimate of temporal trends in stroke incidence from the Greater Cincinnati/Northern Kentucky Stroke Study. *Stroke*. 2010;41:1326–1331.

• Morgenstern LB, Smith MA, Sánchez BN, et al. Persistent ischemic stroke disparities despite declining incidence in Mexican Americans. *Ann Neurol*.

2013;74:778–785.

• Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, de Ferranti S, Després JP, Fullerton HJ, Howard VJ, Huffman MD, Judd SE, Kissela BM, Lackland DT, Lichtman JH, Lisabeth LD, Simin L, Mackey RH, Matchar DB, McGuire DK, Mohler ER III, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Graham N, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Willey JZ, Woo D, Yeh RW, Turner JZ. Heart disease and stroke statistics--2015 update: a report from the American Heart Association. *Circulation*. 2015;131:e-151-e154.

• Nasar DM, Brinjikji W, Cloft HJ, Rabinstein AA. Racial and ethnic disparities in the use of intravenous recombinant tissue plasminogen activator and outcomes for acute ischemic stroke. *J Stroke Cerebrovasc Dis*. 2011.

• Qian F, Fonarow GC, Smith EE, et al. Racial and ethnic differences in outcomes in older patients with acute ischemic stroke. *Circ Cardiovasc Qual Outcomes*. 2013;6: 284-292.

• Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, et al. Heart disease and stroke statistics--2012 update: a report from the American Heart Association. *Circulation*. 2012;125:e-78-e82.

• Schwamm LH, Syed FA, Reeves MJ, Smith EE, Saver JL, Messe S, Bhatt DL, Grau-Sepulveda MV, Peterson ED, Fonarow GC. Temporal trends in patient characteristics and treatment with intravenous thrombolysis among acute ischemic stroke patients at Get With the Guidelines-Stroke hospitals. *Circ Cardiovasc Quality Outcomes*. 2013;6:543-549.

## 2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. ***Measures must be judged to meet the sub criteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.***

**2a.1. Specifications** The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

**De.5. Subject/Topic Area** (check all the areas that apply):

Neurology : Stroke/Transient Ischemic Attack (TIA)

**De.6. Non-Condition Specific**(check all the areas that apply):

Care Coordination, Health and Functional Status : Change, Primary Prevention, Safety : Complications

**De.7. Target Population Category** (Check all the populations for which the measure is specified and tested if any):

Elderly

**S.1. Measure-specific Web Page** (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

[https://www.jointcommission.org/specifications\\_manual\\_joint\\_commission\\_national\\_quality\\_core\\_measures.aspx](https://www.jointcommission.org/specifications_manual_joint_commission_national_quality_core_measures.aspx)

**S.2a. If this is an eMeasure**, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

This is not an eMeasure **Attachment:**

**S.2b. Data Dictionary, Code Table, or Value Sets** (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

No data dictionary **Attachment:**

**S.3.1. For maintenance of endorsement:** Are there changes to the specifications since the last updates/submission. If yes, update the specifications for S1-2 and S4-22 and explain reasons for the changes in S3.2.

Yes

**S.3.2. For maintenance of endorsement,** please briefly describe any important changes to the measure specifications since last measure update and explain the reasons.

Updates were made to the data elements Arrival Date and Arrival Time.

ICD-10 codes were updated to reflect the ICD-10 code updates for Fiscal Year (FY) 2017.

References referring to hospital accreditation were removed.

**S.4. Numerator Statement** (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome) DO NOT include the rationale for the measure.

*IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).*

Acute ischemic stroke patients for whom IV thrombolytic therapy was initiated at this hospital within 3 hours (less than or equal to 180 minutes) of time last known well.

**S.5. Numerator Details** (All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

*IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).*

Five data elements are used to calculate the numerator:

- Date Last Known Well – The month, date, and year prior to hospital arrival at which the patient was last known to be without the signs and symptoms of the current stroke or at his or her baseline state of health.
- Time Last Known Well – The time (military time) prior to hospital arrival at which the patient was last known to be without the signs and symptoms of the current stroke or at his or her baseline state of health.
- IV Thrombolytic Initiation – Documentation that intravenous (IV) thrombolytic therapy (t-PA) was initiated at this hospital. Allowable values: Yes, No/UTD or unable to determine from medical record documentation.
- IV Thrombolytic Initiation Date – The month, date, and year the IV thrombolytic therapy was initiated to a patient with ischemic stroke at this hospital.
- IV Thrombolytic Initiation Time - The time (military time) for which IV thrombolytic therapy was initiated to a patient with ischemic stroke at this hospital.

Patients are eligible for the numerator population when the IV Thrombolytic Initiation Date and IV Thrombolytic Initiation Time minus Date Last Known Well and Time Last Known Well  $\geq 0$  minutes and  $\leq 180$  minutes.

**S.6. Denominator Statement** (Brief, narrative description of the target population being measured)

Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

**S.7. Denominator Details** (All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b.)

*IF an OUTCOME MEASURE, describe how the target population is identified. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).*

Fourteen data elements are used to calculate the denominator:

1. Admission Date – The month, day and year of admission to acute inpatient care.
2. Arrival Date – The earliest documented month, day, and year, the patient arrived at the hospital.
3. Arrival Time - The earliest documented time (military time) the patient arrived at the hospital.
4. Birthdate - The month, day and year the patient was born.

5. Clinical Trial - Documentation that during this hospital stay the patient was enrolled in a clinical trial in which patients with stroke were being studied. Allowable values: Yes or No/UTD.
6. Date Last Known Well – The month, date, and year prior to hospital arrival at which the patient was last known to be without the signs and symptoms of the current stroke or at his or her baseline state of health.
7. Discharge Date – The month day and year the patient was discharged from acute care, left against medical advice or expired during the stay.
8. ED Patient – Documentation that the patient received care in a dedicated emergency department of the facility.  
Allowable values: Yes or No/UTD.
9. Elective Carotid Intervention – Documentation demonstrates that the current admission is solely for the performance of an elective carotid intervention (e.g., elective carotid endarterectomy, angioplasty, carotid stenting).  
Allowable values: Yes or No/UTD.
10. ICD-10-CM Principal Diagnosis Code - The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) code associated with the diagnosis established after study to be chiefly responsible for occasioning the admission of the patient for this hospitalization.
11. Last Known Well – Documentation of the date and time prior to hospital arrival at which it was witnessed or reported that the patient was last known to be without the signs or symptoms of the current stroke or at his or her baseline state of health.  
Allowable values: Yes or No/UTD.
12. Reason for Extending the Initiation of IV Thrombolytic – Physician/APN/PA or pharmacist documentation of a reason for extending the initiation of IV thrombolytic.  
Allowable values: Yes or No/UTD.
13. Reason For Not Initiating IV Thrombolytic – Physician/APN/PA or pharmacist documentation of a reason for not initiating IV thrombolytic.  
Allowable values: Yes or No/UTD.
14. Time Last Known Well – The time (military time) prior to hospital arrival at which the patient was last known to be without the signs and symptoms of the current stroke or at his or her baseline state of health.

Population: Discharges with ICD-10-CM Principal Diagnosis Code for ischemic stroke as defined in Appendix A, Table 8.1.

**S.8. Denominator Exclusions** *(Brief narrative description of exclusions from the target population)*

- Less than 18 years of age
- Length of Stay > 120 days
- Enrolled in clinical trials related to stroke
- Admitted for elective carotid intervention
- Time last known well to arrival in the emergency department greater than 2 hours
- Documented reason for extending the initiation of IV thrombolytic
- Documented reason for not initiating IV thrombolytic

**S.9. Denominator Exclusion Details** *(All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b.)*

- The patient age in years is equal to the Discharge Date minus the Birthdate. Patients less than 18 years are excluded.
- The Length of Stay (LOS) in days is equal to the Discharge Date minus the Admission Date. If the LOS is greater than 120 days, the patient is excluded.
- Patients are excluded if "Yes" is selected for Clinical Trial.
- Patients are excluded with ICD-10-PCS procedure codes for carotid intervention procedures as identified in Appendix A, Table 8.3, if medical record documentation states that the patient was admitted for the elective performance of this procedure.
- Patients with time last known well to arrival in the emergency department greater than 2 hours are excluded.
- Patients are excluded if "Yes" is selected for Reason for Extending the Initiation of IV Thrombolytic.
- Patients are excluded if "Yes" is selected for Reason For Not Initiating IV Thrombolytic.

**S.10. Stratification Information** *(Provide all information required to stratify the measure results, if necessary, including the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically-adjusted version of the measure when appropriate – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b.)*

Not applicable, the measure is not stratified.

**S.11. Risk Adjustment Type** (Select type. Provide specifications for risk stratification in measure testing attachment)

No risk adjustment or risk stratification

If other:

**S.12. Type of score:**

Rate/proportion

If other:

**S.13. Interpretation of Score** (Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score)

Better quality = Higher score

**S.14. Calculation Algorithm/Measure Logic** (Diagram or describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period for data, aggregating data; risk adjustment; etc.)

1. Start processing. Run cases that are included in the Stroke (STK) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Check ICD-10-CM Principal Diagnosis Code

a. If the ICD-10-CM Principal Diagnosis Code is not on Table 8.1, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.

b. If the ICD-10-CM Principal Diagnosis Code is on Table 8.1, continue processing and proceed to ED Patient.

3. Check ED Patient

a. If ED Patient is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If ED Patient equals No, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.

c. If ED Patient equals Yes, continue processing and proceed to Clinical Trial.

4. Check Clinical Trial

a. If Clinical Trial is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If Clinical Trial equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.

c. If Clinical Trial equals No, continue processing and proceed to Elective Carotid Intervention.

5. Check admitted for Elective Carotid Intervention

a. If Elective Carotid Intervention is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If Elective Carotid Intervention equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.

c. If Elective Carotid Intervention equals No, continue processing and proceed to Arrival Date.

6. Check Arrival Date

a. If the Arrival Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If the Arrival Date equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

c. If the Arrival Date equals a Non-Unable To Determine (non-UTD) Value, continue processing and proceed to Arrival Time.

7. Check Arrival Time only if the Arrival Date is a Non Unable to Determine (non-UTD) Value

a. If the Arrival Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If the Arrival Time equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

c. If the Arrival Time equals a Non-Unable To Determine (non-UTD) Value, continue processing and proceed to Last Known Well.

8. Check Last Known Well

- a. If Last Known Well is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Last Known Well equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- c. If Last Known Well equals Yes, continue processing and proceed to Date Last Known Well.

9. Check Date Last Known Well

- a. If the Date Last Known Well is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If the Date Last Known Well equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
- c. If the Date Last Known Well equals a Non-Unable To Determine (non-UTD) Value, continue processing and proceed to Time Last Known Well.

10. Check Time Last Known Well only if the Date Last Known Well is a Non Unable to Determine (non-UTD) Value

- a. If the Time Last Known Well is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If the Time Last Known Well equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
- c. If the Time Last Known Well equals a Non Unable To Determine (non-UTD) Value, continue processing and proceed to the Timing I calculation.

11. Calculate Timing I only if the Time Last Known Well is a Non Unable to Determine (non-UTD) Value. Timing I, in minutes, is equal to the Arrival Date and the Arrival Time minus the Date Last Known Well and the Time Last Known Well. Calculate Timing I for each case that has a Non Unable to Determine (non-UTD) date and time combination.

- a. If the time in minutes is greater than 120, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- b. If the time in minutes is greater than or equal to zero and less than or equal to 120, continue processing and proceed to IV Thrombolytic Initiation.

12. Check IV Thrombolytic Initiation

- a. If IV Thrombolytic Initiation is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If IV Thrombolytic Initiation equals No, continue processing and proceed to Reason for Not Initiating IV Thrombolytic.
- c. If IV Thrombolytic Initiation equals Yes, continue processing and check IV Thrombolytic Initiation Date.

13. Check Reason for Not Initiating IV Thrombolytic

- a. If Reason for Not Initiating IV Thrombolytic is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Reason for Not Initiating IV Thrombolytic equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
- c. If Reason for Not Initiating IV Thrombolytic equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

14. Check IV Thrombolytic Initiation Date

- a. If the IV Thrombolytic Initiation Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If the IV Thrombolytic Initiation Date equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
- c. If the IV Thrombolytic Initiation Date equals a Non Unable To Determine (non-UTD) Value, continue processing and proceed to IV Thrombolytic Initiation Time.

15. Check IV Thrombolytic Initiation Time only if the IV Thrombolytic Initiation Date is a Non Unable to Determine (non-UTD) Value

- a. If the IV Thrombolytic Initiation Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If the IV Thrombolytic Initiation Time equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
- c. If the IV Thrombolytic Initiation Time equals a Non Unable To Determine (non-UTD) Value, continue processing and proceed to the Timing II calculation.

16. Calculate Timing II. Timing II, in minutes, is equal to the IV Thrombolytic Initiation Date and the IV Thrombolytic Initiation Time minus the Date Last Known Well and the Time Last Known Well. a. If the time in minutes is greater than 270, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

- b. If the time in minutes is greater than or equal to zero and less than or equal to 270, continue processing and proceed to recheck Timing II.
- c. If the time in minutes is less than zero, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

17. Recheck Timing II a. If the time in minutes is greater than or equal to zero and less than or equal to 180, the case will proceed to a Measure category Assignment of E and will be in the Numerator Population. Stop processing.

- b. If the time in minutes is greater than 180 and less than or equal to 270, continue processing and proceed to Reason for Extending the Initiation of IV Thrombolytic.

18. Check Reason for Extending the Initiation of IV Thrombolytic a. If Reason for Extending the Initiation of IV Thrombolytic is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If Reason for Extending the Initiation of IV Thrombolytic equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- c. If Reason for Extending the Initiation of IV Thrombolytic equals No, the case will proceed to a Measure Category Assignment D and will be in the Measure Population. Stop processing.

**S.15. Sampling** (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF a PRO-PM, identify whether (and how) proxy responses are allowed.

Hospitals that choose to sample have the option of sampling quarterly or sampling monthly. A hospital may choose to use a larger sample size than is required. Hospitals whose Initial Patient Population size is less than the minimum number of cases per quarter for the measure set cannot sample.

Regardless of the option used, hospital samples must be monitored to ensure that sampling procedures consistently produce statistically valid and useful data. Due to exclusions, hospitals selecting sample cases MUST submit AT LEAST the minimum required sample size.

#### Quarterly Sampling

The Quarterly Sample Size "n", i.e., Minimum Required Sample Size, is based on the Initial Patient Population Size "N" for the STK Measure Set. Hospitals performing quarterly sampling for STK must ensure that their Initial Patient Population and sample sizes meet the following conditions:

If "N"  $\geq$  900, then "n" 180

If "N" 226-899, then "n" 20% of Initial Patient Population size

If "N" 45-225, then "n" 45

If "N" 6-44, No sampling; 100% Initial Patient Population required

If "N" 0-5, Submission of patient level data is not required; if submission occurs, 100% Initial Patient Population required

#### Monthly Sampling

The Monthly Sample Size "n", i.e., Minimum Required Sample Size, is based on the Initial Patient Population Size "N" for the STK Measure Set. Hospitals performing monthly sampling for STK must ensure that their Initial Patient Population and sample sizes meet the following conditions:

If "N"  $\geq$  300, then "n" 60

If "N" 76-299, then "n" 20% of Initial Patient Population size

If "N" 15-75, then "n" 15

If "N"  $<$  15, No sampling; 100% Initial Patient Population required

**S.16. Survey/Patient-reported data** (If measure is based on a survey or instrument, provide instructions for data collection and guidance on minimum response rate.)

IF a PRO-PM, specify calculation of response rates to be reported with performance measure results.

Not applicable. This measure is not based on a survey or a PRO-PM.

**S.17. Data Source** (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.18.

Electronic Health Record (Only), Paper Records

**S.18. Data Source or Collection Instrument** (Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc., and describe how data is collected.)

IF a PRO-PM, identify the specific PROM(s); and standard methods, modes, and languages of administration.

Each data element in the data dictionary includes suggested data sources. The data are collected using contracted Performance Measurement Systems (vendors) that develop data collection tools based on the measure specifications. The tools are verified and tested by Joint Commission staff to confirm the accuracy and conformance of the data collection tool with the measure specifications. The vendor may not offer the measure set to hospitals until verification has been passed.

**S.19. Data Source or Collection Instrument** (available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

No data collection instrument provided

**S.20. Level of Analysis** (Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED)

Facility, Other

**S.21. Care Setting** (Check ONLY the settings for which the measure is SPECIFIED AND TESTED)

Hospital

If other:

**S.22. COMPOSITE Performance Measure** - Additional Specifications (Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)

Not applicable.

## 2. Validity – See attached Measure Testing Submission Form

[0437\\_MeasureTesting\\_MSF5.0\\_Data-635905384294673612.doc](#)

### 2.1 For maintenance of endorsement

Reliability testing: If testing of reliability of the measure score was not presented in prior submission(s), has reliability testing of the measure score been conducted? If yes, please provide results in the Testing attachment. (Do not remove prior testing information – include date of new information in red.)

### 2.2 For maintenance of endorsement

Has additional empirical validity testing of the measure score been conducted? If yes, please provide results in the Testing attachment. (Do not remove prior testing information – include date of new information in red.)

### 2.3 For maintenance of endorsement

Risk adjustment: For outcome, resource use, cost, and some process measures, risk-adjustment that includes SDS factors is no longer prohibited during the SDS Trial Period (2015-2016). Please update sections 1.8, 2a2, 2b2, 2b4, and 2b6 in the Testing attachment and S.14 and S.15 in the online submission form in accordance with the requirements for the SDS Trial Period. NOTE: These sections must be updated even if SDS factors are not included in the risk-adjustment strategy. If yes, and your testing attachment does not have the additional questions for the SDS Trial please add these questions to your testing attachment:

What were the patient-level sociodemographic (SDS) variables that were available and analyzed in the data or sample used? For example, patient-reported data (e.g., income, education, language), proxy variables when SDS data are not collected from each patient (e.g. census tract), or patient community characteristics (e.g. percent vacant housing, crime rate).

Describe the conceptual/clinical and statistical methods and criteria used to select patient factors (clinical factors or sociodemographic factors) used in the statistical risk model or for stratification by risk (e.g., potential factors identified in the literature and/or expert panel; regression analysis; statistical significance of  $p < 0.10$ ; correlation of  $x$  or higher; patient factors should be present at the start of care)

What were the statistical results of the analyses used to select risk factors?

Describe the analyses and interpretation resulting in the decision to select SDS factors (e.g. prevalence of the factor across measured entities, empirical association with the outcome, contribution of unique variation in the outcome, assessment of between-unit effects and within-unit effects)

### 3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

#### 3a. Byproduct of Care Processes

For clinical measures, the required data elements are routinely generated and used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order).

##### 3a.1. Data Elements Generated as Byproduct of Care Processes.

generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition, Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims), Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry), Other  
If other: Data element allowable values are selected, either manually or electronically, from clinical and coded data available in medical record documentation. All medical record documentation is used in the abstraction process. Vendor data collection tools are used to import data elements needed for measure rate calculation.

#### 3b. Electronic Sources

The required data elements are available in electronic health records or other electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.

**3b.1. To what extent are the specified data elements available electronically in defined fields** (i.e., data elements that are needed to compute the performance measure score are in defined, computer-readable fields) Update this field for **maintenance of endorsement**.

Some data elements are in defined fields in electronic sources

**3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.** For **maintenance of endorsement**, if this measure is not an eMeasure (eCQM), please describe any efforts to develop an eMeasure (eCQM).

The Joint Commission recognizes that not all hospitals currently have the capacity to abstract the electronic version of this measure, so continues to offer this chart-abstracted version which allows for data capture from unstructured data fields. All data elements needed to compute the STK-4 performance measure score have been retooled for capture from electronic sources. Annual updates are performed to match the eCQM specifications to the current version of the chart-abstracted specifications.

**3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL. Please also complete and attach the NQF Feasibility Score Card.**

Attachment:

#### 3c. Data Collection Strategy

Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, costs associated with fees/licensing of proprietary measures) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use). For eMeasures, a feasibility assessment addresses the data elements and measure logic and demonstrates the eMeasure can be implemented or feasibility concerns can be adequately addressed.

**3c.1. Required for maintenance of endorsement.** Describe difficulties (as a result of testing and/or operational use of the measure) regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

**IF a PRO-PM, consider implications for both individuals providing PRO data (patients, service recipients, respondents) and those whose performance is being measured.**

At the present time, hospitals using this performance measure generally collect measure data via manual review of the paper medical record, the EHR or a combination of both. Collected data are submitted to The Joint Commission on a quarterly basis, by way of contracted performance measurement system vendors, as described previously. Specifications for this measure are freely available to anyone who wishes to use the measure. Feedback from hospitals using this measure indicates that required data elements are generally available in the medical record, and measure specifications are robust and easy to understand. As described above, as feedback from measure users has indicated the need for clarification or revision of measure specifications, this has taken place in the form of guidelines for abstraction. Specific revisions are detailed in the Release Notes section of this submission.

**3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm).**

There are no fees or licensing requirements to use The Joint Commission performance measures, all of which are in the public domain.

## 4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

### 4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

#### 4.1. Current and Planned Use

*NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.*

Specific Plan for Use	Current Use (for current use provide URL)
	Public Reporting Quality Check® <a href="http://www.qualitycheck.org/consumer/searchQCR.aspx">http://www.qualitycheck.org/consumer/searchQCR.aspx</a> Hospital Compare <a href="https://www.medicare.gov/hospitalcompare/search.html">https://www.medicare.gov/hospitalcompare/search.html</a>  Public Health/Disease Surveillance Paul Coverdell National Acute Stroke Registry <a href="http://www.cdc.gov/dhdsp/programs/stroke_registry.htm">http://www.cdc.gov/dhdsp/programs/stroke_registry.htm</a>  Payment Program Hospital Inpatient Quality Reporting Program <a href="https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/hospitalrhqdapu.html">https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/hospitalrhqdapu.html</a>  Regulatory and Accreditation Programs Hospital Accreditation Program <a href="http://www.jointcommission.org/">http://www.jointcommission.org/</a>  Quality Improvement (Internal to the specific organization)

	Disease-Specific Care Certification for Comprehensive Stroke Centers <a href="http://www.jointcommission.org/certification/dsc_home.aspx">http://www.jointcommission.org/certification/dsc_home.aspx</a> <a href="http://www.jointcommission.org/certification/dsc_home.aspx">http://www.jointcommission.org/certification/dsc_home.aspx</a> Disease-Specific Care Certification for Primary Stroke Centers
--	--

**4a.1. For each CURRENT use, checked above (update for maintenance of endorsement), provide:**

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included
- Level of measurement and setting
- Name of program and sponsor: Quality Check®; The Joint Commission
- Purpose: A public website that allows consumers to: search for accredited and certified organizations by city and state, by name or by zip code (up to 250 miles); find organizations by type of service provided within a geographic area; download free hospital performance measure results; and, print a list of Joint Commission certified disease-specific care programs and health care staffing firms.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3300 Joint Commission-accredited hospitals (2014)
- Name of program and sponsor: Hospital Compare; Centers for Medicare & Medicaid Services
- Purpose: A public website that provides information that helps consumers decide where to obtain healthcare and encourages hospitals to improve the quality of care they provide.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 4000+ Medicare-certified hospitals (2015)
- Name of program and sponsor: Paul Coverdell National Acute Stroke Registry; Centers for Disease Control and Prevention
- Purpose: A national registry that measures, tracks, and improves the quality of care and access to care for stroke patients from onset of stroke symptoms through rehabilitation and recovery; decreases rate of premature death and disability from stroke; eliminates disparities in care; supports the comprehensive stroke system across the continuum of care; improves access to rehabilitation and opportunities for recovery after stroke; and, increases the workforce capacity and scientific knowledge of stroke care within stroke systems of care.
- Geographic area and number and percentage of accountable entities and patients included: 11 states; 403 hospitals (CDC, 2014)
- Name of program and sponsor: Hospital Inpatient Quality Reporting Program; Centers for Medicare & Medicaid Services
- Purpose: The Hospital Inpatient Quality Reporting (Hospital IQR) program was mandated by Section 501(b) of the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003. This section of the MMA authorized CMS to pay hospitals that successfully report designated quality measures a higher annual update to their payment rates.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3500 Medicare-certified hospitals (2015)
- Name of program and sponsor: Annual Report-Improving America's Hospitals; The Joint Commission
- Purpose: The annual report summarizes the performance of Joint Commission-accredited hospitals on 46 accountability measures of evidence-based care processes closely linked to positive patient outcomes, and provides benchmarks from Top Performer on Key Quality Measures® hospitals.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3300 Joint Commission-accredited hospitals (2014)
- Name of program and sponsor: Disease-Specific Care Certification for Comprehensive Stroke Centers; The Joint Commission
- Purpose: A certification program that recognizes the specific capabilities of hospitals that treat the most complex stroke cases.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 95 hospitals
- Name of program and sponsor: Disease-Specific Care Certification for Primary Stroke Centers; The Joint Commission
- Purpose: A certification program that recognizes hospitals that effectively manage and meet the unique and specialized needs of stroke patients, and make exceptional efforts to foster improved outcomes for better stroke care.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 1079 hospitals

- Name of program and sponsor Hospital Accreditation Program; The Joint Commission
- Purpose: An accreditation program that recognizes hospitals that meet standard requirements to provide safe and effective patient care.
- Geographic area and number and percentage of accountable entities and patients included Nationwide; 3300 Joint Commission-accredited hospitals (2014)

**4a.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)**

Not applicable

**4a.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)**

Not applicable

#### Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

**4b. Refer to data provided in 1b but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included.)**

**If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.**

Not applicable

#### 4c. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

**4c.1. Please explain any unexpected findings (positive or negative) during implementation of this measure including unintended impacts on patients.**

Guidelines for the expansion of the time window for treatment of acute ischemic stroke with intravenous tissue plasminogen activator (American Heart Association/American Stroke Association, 2009) have been challenging for STK-4 Thrombolytic Therapy which includes only those patients who receive IV t-PA within 3 hours in the numerator population. The updated guideline recommendation for IV t-PA administration within 3 to 4.5 hours after stroke generated discussion about the STK-4 measure construct and the possibility of revising the STK-4 numerator to include patients treated within 4.5 hours. This recommendation also generated concern that thrombolytic therapy initiation would be delayed for patients eligible to receive treatment within 3 hours and result in poorer outcomes for stroke patients. Since earlier initiation is associated with better neurological outcomes, the STK-4 numerator has remained unchanged; however, the measure specifications have been modified to clearly exclude patients who are treated with IV t-PA within 3 to 4.5 hours and have a documented medical or patient reason for the delay in initiation. An unexpected benefit of this change is that it promotes healthcare staff awareness that earlier initiation of thrombolytic therapy is better for stroke patients and also preserves the goal of the NINDS investigators to initiate thrombolytic treatment for eligible patients within 3 hours.

**4c.2. Please explain any unexpected benefits from implementation of this measure.**

**4d1.1. Describe how performance results, data, and assistance with interpretation have been provided to those being measured or other users during development or implementation.**

**How many and which types of measured entities and/or others were included? If only a sample of measured entities were included, describe the full population and how the sample was selected.**

Not applicable. Not seeking endorsement + designation at this time.

**4d1.2. Describe the process(es) involved, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.**

Not applicable. Not seeking endorsement + designation at this time.

**4d2.1. Summarize the feedback on measure performance and implementation from the measured entities and others described in 4d.1.**

**Describe how feedback was obtained.**

Not applicable. Not seeking endorsement + designation at this time.

**4d2.2. Summarize the feedback obtained from those being measured.**

Not applicable. Not seeking endorsement + designation at this time.

**4d2.3. Summarize the feedback obtained from other users**

Not applicable. Not seeking endorsement + designation at this time.

**4d.3. Describe how the feedback described in 4d.2 has been considered when developing or revising the measure specifications or implementation, including whether the measure was modified and why or why not.**

Not applicable. Not seeking endorsement + designation at this time.

## 5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

### 5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.

#### 5.1a. List of related or competing measures (selected from NQF-endorsed measures)

0164 : Fibrinolytic Therapy received within 30 minutes of hospital arrival

0242 : Stroke and Stroke Rehabilitation: Tissue Plasminogen Activator (t-PA) Considered

0288 : Fibrinolytic Therapy Received Within 30 Minutes of ED Arrival

1952 : Time to Intravenous Thrombolytic Therapy

#### 5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.

0242 : Stroke and Stroke Rehabilitation: Tissue Plasminogen Activator (t-PA) Considered

American Medical Association - Physician Consortium for Performance Improvement (AMA-PCPI) – no longer NQF endorsed

### 5a. Harmonization of Related Measures

The measure specifications are harmonized with related measures;

**OR**

The differences in specifications are justified

**5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):**

**Are the measure specifications harmonized to the extent possible?**

No

**5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.**

Measures 0288 and 0164 are AMI (Acute Myocardial Infarction) measures. They are part of the Centers for Medicare & Medicaid Services/The Joint Commission aligned measures relating to the administration of fibrinolytic therapy for hospital inpatients and are harmonized with 0437 to the extent that the measures utilize some of the same data elements. The target population for 0288 and 0164 is inpatients with an ICD-10-CM Principal Diagnosis Code for acute myocardial infarction. The target population for 0437 differs in that it includes patients hospitalized for acute ischemic stroke. In addition, the evidence around the timeframe for administration of therapy is different for the AMI and ischemic stroke populations, and 0288 and 0164 include administration of lytic drugs other than activase/alteplase/IV t-PA/recombinant tissue plasminogen activator (rt-PA). Measure 0164 will be removed from the CMS/The Joint Commission aligned measures starting with 01/01/2016 discharges. The target population for measure 1952 from the American Heart Association/American Stroke Association also includes patients hospitalized for acute ischemic stroke; however, the measure captures average door-to-needle time and uses a target of less than 60 minutes rather than the proportion of patients who arrive within 2 hours and receive t-PA within 3 hours of time last known well. Measure 0242 is a physician performance measure with a targeted population of ischemic stroke patients identified through CPT codes and could extend to the outpatient setting. This measure evaluates physician practice as opposed to hospital processes. It is no longer NQF-endorsed

**5b. Competing Measures**

The measure is superior to competing measures (e.g., is a more valid or efficient way to measure);

**OR**

Multiple measures are justified.

**5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s):**

**Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)**

Not Applicable

**Appendix**

**A.1 Supplemental materials may be provided in an appendix.** All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed.

Available at measure-specific web page URL identified in S.1 Attachment:

**Contact Information**

**Co.1 Measure Steward (Intellectual Property Owner):** The Joint Commission

**Co.2 Point of Contact:** JohnMarc, Alban, jalban@jointcommission.org, 630-792-5304-

**Co.3 Measure Developer if different from Measure Steward:** The Joint Commission

**Co.4 Point of Contact:** Karen, Kolbusz, kkolbusz@jointcommission.org, 630-792-5931-

**Additional Information**

**Ad.1 Workgroup/Expert Panel involved in measure development**

**Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.**

The role of the Technical Advisory Panel (TAP) is to provide advisory oversight in literature review, measure content and maintenance of the specifications.

Members are:

Harold P. Adams, Jr., MD  
University of Iowa Health Care  
Iowa City, IA

Mark J. Alberts, MD  
University of Texas Southwestern  
Dallas, TX

Anne W. Alexandrov, RN  
Health Outcomes Institute  
Fountain Hills, AZ

Nadine Allyn, RD  
American Heart Association  
Dallas, Texas

Mary G. George, MD  
Centers for Disease Control and Prevention  
Atlanta, GA

Martin Gizzi, MD  
Legacy Health System  
Portland, OR

Marianna Gorbaty  
Mathematica Policy Research, Inc.  
Washington, DC

Judith Hinchey, MD  
Tuft's Medical School  
Steward St. Elizabeth's Medical Center  
Boston, MA

Edward C. Jauch, MD  
Medical University of South Carolina  
Charleston, SC

Irene Katzan, MD  
Cleveland Clinic  
Cleveland, OH

Kimberly E. Levasseur-Franklin, PharmD  
Northwestern Memorial Hospital  
Chicago, IL

Kathy Morrison, RN  
Penn State Hershey Medical Center  
Hershey, PA

Marilyn M. Rymer, MD  
University of Kansas  
Kansas City, MO

Jeffrey Saver, MD  
UCLA Medical Center  
Los Angeles, CA

Lee H. Schwamm, MD  
Harvard Medical School  
Massachusetts General Hospital  
Boston, MA

Deborah, Summers, RN  
St. Luke's Brain and Stroke Institute  
Kansas City, MO

Osama O. Zaidat, MD  
St. Vincent Mercy Hospital  
Toledo, OH

Richard D. Zorowitz, MD  
Medstar National Rehabilitation Network  
Washington, DC

**Measure Developer/Steward Updates and Ongoing Maintenance**

**Ad.2 Year the measure was first released:** 2009

**Ad.3 Month and Year of most recent revision:** 10, 2015

**Ad.4 What is your frequency for review/update of this measure?** Biannual

**Ad.5 When is the next scheduled review/update for this measure?** 07, 2016

**Ad.6 Copyright statement:** No royalty or use fee is required for copying or reprinting this manual, but the following are required as a condition of usage: 1) disclosure that the Specifications Manual is periodically updated, and that the version being copied or reprinted may not be up-to-date when used unless the copier or printer has verified the version to be up-to-date and affirms that, and 2) users participating in Joint Commission accreditation, including ORYX® vendors, are required to update their software and associated documentation based on the published manual production timelines.

**Ad.7 Disclaimers:**

**Ad.8 Additional Information/Comments:**