

NATIONAL QUALITY FORUM

Measure Submission and Evaluation Worksheet 5.0

This form contains the information submitted by measure developers/stewards, organized according to NQF's measure evaluation criteria and process. The evaluation criteria, evaluation guidance documents, and a blank online submission form are available on the [submitting standards web page](#).

NQF #: 0440	NQF Project: Neurology Project
(for Endorsement Maintenance Review)	
Original Endorsement Date: Jul 31, 2008 Most Recent Endorsement Date: Jul 31, 2008 Last Updated Date: Sep 11, 2017	
BRIEF MEASURE INFORMATION	
De.1 Measure Title: STK-08: Stroke Education	
Co.1.1 Measure Steward: The Joint Commission	
De.2 Brief Description of Measure: This measure captures the proportion of ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given stroke education materials. 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-4: Thrombolytic Therapy, STK-5: Antithrombotic Therapy By End of Hospital Day 2, STK-6 Discharged on Statin Medication, and STK-10: Assessed for Rehabilitation) that are used in The Joint Commission's hospital accreditation and Disease-Specific Care certification programs.	
2a1.1 Numerator Statement: Ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given educational material addressing all of the following: <ol style="list-style-type: none"> 1. Activation of emergency medical system 2. Need for follow-up after discharge 3. Medications prescribed at discharge 4. Risk factors for stroke 5. Warning signs and symptoms of stroke 	
2a1.4 Denominator Statement: Ischemic stroke or hemorrhagic stroke patients discharged home	
2a1.8 Denominator Exclusions: <ul style="list-style-type: none"> • Less than 18 years of age • Length of Stay > 120 days • Comfort measures only documented • Enrolled in clinical trials related to stroke • Admitted for elective carotid intervention 	
1.1 Measure Type: Process	
2a1. 25-26 Data Source: Electronic Health Record (Only) , Other , Paper Records	
2a1.33 Level of Analysis: Facility , Other	
1.2-1.4 Is this measure paired with another measure? No	
De.3 If included in a composite, please identify the composite measure (title and NQF number if endorsed): Not Applicable	

STAFF NOTES *(issues or questions regarding any criteria)*

Comments on Conditions for Consideration:

Is the measure untested? Yes ☐ No ☒ If untested, explain how it meets criteria for consideration for time-limited endorsement:

1a. Specific national health goal/priority identified by DHHS or NPP addressed by the measure (check De.5):

5. Similar/related [endorsed](#) or submitted measures (check 5.1):

Other Criteria:

Staff Reviewer Name(s):

1. IMPACT, OPPORTUNITY, EVIDENCE - IMPORTANCE TO MEASURE AND REPORT

Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All three subcriteria must be met to pass this criterion. See [guidance on evidence](#).

Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria. (evaluation criteria)

1a. High Impact: H ☒ M ☐ L ☐ I ☐

(The measure directly addresses a specific national health goal/priority identified by DHHS or NPP, or some other high impact aspect of healthcare.)

De.4 Subject/Topic Areas (Check all the areas that apply): [Neurology : Stroke/Transient Ischemic Attack \(TIA\)](#)

De.5 Non-Condition Specific (Check all the areas that apply): [Access to Care](#), [Care Coordination](#), [Person-and Family-Centered Care](#), [Population Health](#), [Primary Prevention](#), [Safety](#), [Safety : Complications](#), [Safety : Medication](#)

1a.1 Demonstrated High Impact Aspect of Healthcare: [Affects large numbers](#), [Patient/societal consequences of poor quality](#), [Other](#)

1a.2 If "Other," please describe: [Patient Education](#)

1a.3 Summary of Evidence of High Impact (Provide epidemiologic or resource use data):

[Stroke ranks as the number four cause of death in the United States, following diseases of the heart, cancer, and chronic lung-related diseases. Each year, ~ 795,000 people experience a new or recurrent stroke. Approximately 610,000 of these are first attacks, and 185,000 are recurrent strokes. These numbers equate to one stroke victim every 40 seconds on average. According to 2008 mortality data, one of every 18 deaths in the United States is attributable to stroke. More women than men die of stroke each year. Women accounted for 60.1% of US stroke deaths in 2008 \(Roger VL, et al., 2012\).](#)

[Stroke is also a leading cause of long-term disability \(George M, et al., 2009\). Data from the National Heart, Lung and Blood Institute \(NHLBI\) revealed that 50% of ischemic stroke survivors age > 65 years had some hemiparesis; 35% experienced depressive symptoms; 30 % were unable to ambulate without assistance; 26% were dependent in activities of daily living; 19% had aphasia; and, 26% were institutionalized in a nursing home. The mean lifetime cost of ischemic stroke, including inpatient care, rehabilitation, and follow-up as necessary for residual deficits are estimated at \\$140,048 per person \(Roger VL, et al., 2012\).](#)

[There are many examples of how patient education programs for specific chronic conditions have increased healthful behaviors, improved health status, and/or decreased health care costs of their participants. Clinical practice guidelines include recommendations for patient and family education during hospitalization as well](#)

as information about resources for social support services. Some clinical trials have shown measurable benefits in patient and caregiver outcomes with the application of education and support strategies. The type of stroke experienced and the resulting outcomes will play a large role in determining not only the course of treatment but also what education will be required. Patient education should include information about the event (e.g., cause, treatment, and risk factors), the role of various medications or strategies, as well as desirable lifestyle modifications to reduce risk or improve outcomes. Family/caregivers will also need guidance in planning effective and realistic care strategies appropriate to the patient's prognosis and potential for rehabilitation.

1a.4 Citations for Evidence of High Impact cited in 1a.3: • Centers for Disease Control and Prevention (CDC). Prevalence and most common causes of disability among adults-United States 2005. MMWR. 2009;58:421-26.

- Duncan et al, Stroke Rehabilitation Clinical Practice Guidelines Stroke. 2005;36:e100-e143.
- Evans RL, Matlock AL, Bishop DS, Stranahan S, Pederson C. Family intervention after stroke: Does counseling or education help?, Stroke 1988;19:1243-1249.
- Furie KL, Kasner SE, Adams RJ, Albers GW, et al. Guidelines for the Prevention of Stroke in Patients With Stroke or Transient Ischemic Attack: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2011;42:241-43.
- George, M., Xin, Tong, McGruder, H., Yoon, P., Rosamond, W., Winkquist, A., Hinchey, J., Wall, H., Pandey, D. Centers for Disease Control and Prevention (CDC). Prevalence and most common causes of disability among adults-United States 2005. MMWR. 2009;58:421-26.
- Goldstein LB, Bushnell CD, Adams RJ, Appel LJ, Braun LT, Chaturvedi S, Creager MA, Culebras A, Eckel RH, Hart RG, Hinchey JA, Howard VJ, Jauch EC, Levine SR, Meschia JF, Moore WS, Nixon JV, Pearson TA. Guidelines for primary prevention of stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2011;42:1-68.
- Kaiser Permanente Clinical Practice Guidelines for Acute Stroke, Kaiser Permanente Medical Group, 1998.
- Lorig KR, Sobel DS, Stewart AL, et al. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: A randomized trial. Medical Care 1999;37:5-14.
- Post Stroke Rehabilitation, Clinical Practice Guideline No.16, Agency for Health Care Policy and Research (now known as Agency for Healthcare Research and Quality), 1995.
- Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Kissela BM, Kittner SJ, Lackland DT, Lichtman, JH, Lisabeth LD, Makuc DM, Marcus GM, Marelli A, Matchar DB, Moy CS, Mozaffarian D, Mussolino ME, Nichol G, Paynter NP, Soliman EZ, Sorlie PD, Sotoodehnia N, Turan TN, Virani SS, Wong ND, Woo D, and Turner MB. Heart disease and stroke statistics--2012 update: a report from the American Heart Association. Circulation. 2012;125:e-78-82, e-119-127.

1b. Opportunity for Improvement: H● M● L● I●

(There is a demonstrated performance gap - variability or overall less than optimal performance)

1b.1 Briefly explain the benefits (improvements in quality) envisioned by use of this measure:

As stated above, 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. Data obtained from a total of 6867 stroke admissions / 98 hospitals revealed that less than 10% of acute stroke admissions arrived at the emergency department within 1 hour of stroke symptom onset, and less than 25% arrived within 3 hours. These findings point to the need for continued mass public education to increase awareness and recognition of early warning signs and the importance of seeking emergency medical care as soon as possible. (The Paul Coverdell Prototype Registries Writing Group, 2005).

Healthcare organizations that track stroke education provided to patients and/or caregivers for internal quality improvement purposes have seen significant improvement in the measure rate over time. This

measure is included in the FY 2015 CMS Hospital Inpatient Quality Reporting Program which will also promote improvements in quality at the national level.

1b.2 Summary of Data Demonstrating Performance Gap (*Variation or overall less than optimal performance across providers*): [**For Maintenance** – *Descriptive statistics for performance results for this measure - distribution of scores for measured entities by quartile/decile, mean, median, SD, min, max, etc.*]

Based on 8 quarters of data reported to The Joint Commission October 1, 2009, through September 30, 2011, STK-08 has demonstrated improvement in national aggregate rates ranging from a low of 74.4% for 4Q2009 to a high of 89.5% for 3Q2011. The average rate for all hospitals (n=154) collecting data for this measure is currently 87.1% (n=153; 3Q2011), indicating a potential performance gap of more than 10% if the optimal rate is 100%.

Data collected by the Paul Coverdell National Acute Stroke Registry (PCNASR) displayed a significant performance gap for stroke education. For the period 2005—2009, PCNASR collected stroke care data through seven state health departments. In 2005, 4,378 hospitals reported an aggregate rate of 54% for stroke education; 27,354 hospitals (70%) in 2009. Although rates significantly increased with each year of data collection, a potential performance gap of approximately 30% still existed after five years.

1b.3 Citations for Data on Performance Gap: [**For Maintenance** – *Description of the data or sample for measure results reported in 1b.2 including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included*]

- Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report (MMWR). Use of registry to improve acute stroke care—seven states, 2005-2009. February 25, 2011;60(07):206-210.
- The Paul Coverdell Prototype Registries Writing Group. Acute stroke care in the US: Results from 4 pilot prototypes of the Paul Coverdell National Acute Stroke Registry. Stroke. 2005;36:1232-1240.
- The Joint Commission, unpublished data, 2011.

1b.4 Summary of Data on Disparities by Population Group: [**For Maintenance** – *Descriptive statistics for performance results for this measure by population group*]

According to a 2011 report from the American Heart Association/American Stroke Association, 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. Statistical figures reveal that although women have a higher “life-time risk of stroke” than men, they have a lower “age-adjusted risk of stroke” and, women ages 45-85 have a lower overall rate of stroke. Stroke risk significantly increases for women > 85 years old; however, women live longer than men which may account in part for the difference (Roger VL, et al., 2012).

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, 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 if 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.

The importance of stroke education cannot be over emphasized. Stroke is a medical emergency and most people do not recognize the five main symptoms of stroke and therefore do not seek immediate medical attention. Only 20% to 40% of the general population is capable of recognizing all five warning signs and symptoms and the need to immediately call 9-1-1 (Greenlund KJ, et al., 2003). Disparities in stroke awareness and symptom recognition between racial and ethnic groups has been reported in multiple studies with blacks or African Americans (29.5%) and Hispanics (26.8%) less knowledgeable than whites (41.3%) (CDC, 2005).

1b.5 Citations for Data on Disparities Cited in 1b.4: [For Maintenance – Description of the data or sample for measure results reported in 1b.4 including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included]

- Brown AF, Liang LJ, Vassar SD, Stein-Merkin S, Longstreth WT Jr, Ovbiagele B, Yan T, Escarce JJ. Department of Neurology, UCLA GIM&HSR. Neighborhood disadvantage and ischemic stroke: the Cardiovascular Health Study (CHS). Stroke. 2011;42(12): 3363-3368.
- Centers for Disease Control and Prevention. Awareness of stroke warning symptoms: 13 states and the District of Columbia, 2005. MMWR.2008;57:481-485.
- 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, Griffith P, Gorelick PB, Howard G, Leira EC, Morgenstern LB, Ovbiagele B, Peterson E, Rosamond W, Trimble B, Valderrama 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.
- 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.



- Greenlund KJ, Neff LJ, Zheng ZJ, Keenan NL, Giles WH, Ayala CA, Croft JB, Mensah GA. Low public recognition of major stroke symptoms. Am J Prev Med. 2003;25:315-319.
- 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.
- 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.
- 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.
- Lutfiyya MN, Ng L, Asner N, Lipsky MD. Disparities in knowledge of heart attack and stroke symptoms among adult men: an analysis of Behavioral Risk Factor Surveillance Survey data. J Natl Med Assoc. 2008;100:1116-1124.
- Nicol MB, Thrift AG. Knowledge of risk factors and warning signs of stroke. Vasc Health Risk Manag. 2005;1:137-147.
- Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Kissela BM, Kittner SJ, Lackland DT, Lichtman, JH, Lisabeth LD, Makuc DM, Marcus GM, Marelli A, Matchar DB, Moy CS, Mozaffarian D, Mussolino ME, Nichol G, Paynter NP, Soliman EZ, Sorlie PD, Sotoodehnia N, Turan TN, Virani SS, Wong ND, Woo D, and Turner MB. Heart disease and stroke statistics--2012 update: a report from the American Heart Association. Circulation. 2012;125: e78-e82.
- Schneider AT, Pancioli AM, Khoury JC, Rademacher E, Tuchfarber A, Miller R, woo D, Kissela B, Broderick JP. Trends in community knowledge of warning signs and risk factors for stroke. JAMA.2003;289:343-346.
- Wiley JZ, Williams O, Boden-Albala B. Stroke literacy in Central Harlem: a high-risk stroke population. Neurology. 2009;73:1950-1956.
- Zahuranec DB, Morgenstern LB, Garcia NM, Conley KM, Lisabeth LD, Rank GS, Smith MA, Meurer WJ, Resnicow K, Brown DL. Stroke health and risk reduction (SHARE) pilot project: feasibility and need for church-based stroke health promotion in a bi-ethnic community. Stroke. 2008;39(5):1583-1585.

1c. Evidence (*Measure focus is a health outcome OR meets the criteria for quantity, quality, consistency of the body of evidence.*)

Is the measure focus a health outcome? Yes ☐ No ☐ **If not a health outcome, rate the body of evidence.**

Quantity: H ☐ M ☐ L ☐ I ☐ **Quality:** H ☐ M ☐ L ☐ I ☐ **Consistency:** H ☐ M ☐ L ☐ I ☐

Quantity	Quality	Consistency	Does the measure pass subcriterion 1c?
M-H	M-H	M-H	Yes <input type="radio"/>
L	M-H	M	Yes <input type="radio"/> IF additional research unlikely to change conclusion that benefits to patients outweigh harms: otherwise No <input type="radio"/>
M-H	L	M-H	Yes <input type="radio"/> IF potential benefits to patients clearly outweigh potential harms: otherwise No <input type="radio"/>

L-M-H	L-M-H	L	No 
Health outcome – rationale supports relationship to at least one healthcare structure, process, intervention, or service			Does the measure pass subcriterion1c? Yes  IF rationale supports relationship
<p>1c.1 Structure-Process-Outcome Relationship (<i>Briefly state the measure focus, e.g., health outcome, intermediate clinical outcome, process, structure; then identify the appropriate links, e.g., structure-process-health outcome; process- health outcome; intermediate clinical outcome-health outcome</i>):</p> <p>The focus of the measure is to increase patient and public awareness of stroke through the provision of written instructions/materials about stroke risk factors, warning signs and symptoms, activation of the emergency medical system (EMS) when warning signs and symptoms occur, discharge medications, and the need for ongoing medical care after a hospitalization for stroke.</p> <p>Stroke education at discharge >> increased awareness of risk factors for stroke >> early recognition of warning signs and symptoms of stroke >> early activation of the EMS >> early arrival at hospital emergency department >> increased likelihood of thrombolytic administration >> increased patient compliance with medications prescribed at discharge >> increased patient compliance with post-discharge follow-up >> improved neurological outcomes >> secondary stroke prevention >> decreased morbidity and mortality.</p> <p>1c.2-3 Type of Evidence (<i>Check all that apply</i>):</p> <p>Clinical Practice Guideline, Selected individual studies (rather than entire body of evidence), Systematic review of body of evidence (other than within guideline development)</p> <p>1c.4 Directness of Evidence to the Specified Measure (<i>State the central topic, population, and outcomes addressed in the body of evidence and identify any differences from the measure focus and measure target population</i>):</p> <p>The central topic for this measure is stroke education. The measure is consistent with the body of evidence that states that patient and family education should be comprehensive and address the course of illness, rationale for treatment, prognosis, psychosocial and safety issues, and secondary prevention. The measure details five educational components which must be addressed and tailored to the individual needs of the patient: activation of the emergency medical system, follow-up after discharge, discharge medications, risk factors for stroke, and warning signs and symptoms of stroke. These five components are consistent with the American Heart Association/American Stroke Association “Target: Stroke” public awareness initiative, as well as, clinical guideline recommendations for primary and secondary prevention of stroke and cardiovascular disease.</p> <p>1c.5 Quantity of Studies in the <u>Body of Evidence</u> (<i>Total number of studies, not articles</i>): Relevant literature pertaining to stroke education of patients and caregivers was identified through a Cochrane review (Cochrane Database of Systematic Review, 16 April 2008) which identified 17 randomized control trials (RCTs) involving 1773 patients and 1058 carer participants. Eight of the studies identified a passive intervention; nine an active information intervention. The search strategy included the Cochrane Stroke Group’s Trials Register (May 2007); the Cochrane Central Register of Controlled Trials (CENTRAL)(The Cochrane Library 2007, Issue 1), MEDLINE (1966 to March 2007); CINAHL (1982 to march 2007), EMBASE (1980 to March 2007), PsycINFO (1974 to March 2007), Assia (1987 to March 2007), Index to UK theses (1970 to March 2007), Science Citation Index and Social Science Citation Index (1981 to March 2007), and Dissertation Abstracts (1961 to March 2007). In addition, ongoing trials and research registers (March 2007), bibliographies and retrieved papers, relevant articles and books, and the Journal of Advanced Nursing were also searched and researchers contacted for additional information. Randomized trials involving patients or caregivers of patients with a clinical diagnosis of stroke where an educational intervention or education in combination with another therapy was compared with standard care were included in the review. This Cochrane Review concluded that educational information improves patient and</p>			

caregiver knowledge of stroke, patient satisfaction, and reduces depression scores.

A more recent systematic review from The Netherlands identified 21 studies pertaining to stroke patients' and caregivers' educational needs (MEDLINE, CINAHL EMBASE, PsychINFO and The Cochrane Library(2009)). Among the educational needs identified, patients and their caregivers were most concerned about information on stroke prevention, treatment and functional recovery. The reviewers concluded that improved education of patients and caregivers is needed (Hafsteisdottir TB, et al., 2011).

In addition to these two systematic reviews, eight randomized trials relevant to stroke education were noted in a search conducted by The Joint Commission which is summarized below:

1. Preventing recurrences of thromboembolic events through coordinated treatment in the District of Columbia (Dromerick AW, et al. 2011) – PROTECT DC is a Phase II, single-blind randomized controlled trial comparing in-hospital stroke education plus stroke navigators to usual care (n=250).
2. The effect of motivational interviewing after ischemic stroke on patient knowledge and patient satisfaction with care: a pilot study (Byers AM, et al., 2010). A randomized controlled trial designed to compare the effect of verbal and written education at the time of hospital discharge with individualized protocol-driven verbal and written education (n=20).
3. Enhancing the effectiveness of community stroke risk screening: a randomized controlled trial (Anderson RT, et al., 2010). Patients were randomly allocated to an attention control arm or behavioral intervention control arm (n=227).
4. Effectiveness of stroke education in the emergency department waiting room (Chan YF, et al., 2010). The study evaluated the effectiveness of education on warning signs and symptoms of stroke, risk factors, behavior modification, and the urgency to seek medical attention provided to patients and caregivers in the emergency department waiting area (N=329).
5. Effect of an educational video on emergency department patient stroke knowledge (Chan YF, et al. 2008). Participants were randomized into two arm: those watching a 12-minute educational video and control.
6. A community-based exercise and education scheme for stroke survivors: a randomized controlled trial and economic evaluation (Harrington R, et al., 2010). A single blind randomized controlled trial evaluating exercise and stroke education provided in the community setting (n=243).
7. ExStroke Pilot Trial of the effect of repeated instructions to improve physical activity after ischemic stroke: a multinational randomized controlled trial (Boysen G, et al., 2009). Exercise instructions were provided to stroke patients at the time of hospital discharge and repeated at five times at follow-up visits over a 24-month period (N=314).
8. The impact of the extended parallel process model on stroke awareness: pilot results from a novel study (Davis SM, et al., 2009). A single blinded, randomized pretest, posttest study evaluating stroke knowledge using two age cohorts: younger (18 to 30 years) and older (50+ years) (N=274).

Literally hundreds of other studies related to patient education, specifically stroke education, knowledge, and awareness, were also identified through independent searches. Due to the topic, many of these studies are qualitative, employing interviews, questionnaires and mixed designs, rather than randomized controlled trials.

1c.6 Quality of Body of Evidence (*Summarize the certainty or confidence in the estimates of benefits and harms to patients across studies in the body of evidence resulting from study factors. Please address: a) study design/flaws; b) directness/indirectness of the evidence to this measure (e.g., interventions, comparisons, outcomes assessed, population included in the evidence); and c) imprecision/wide confidence intervals due to few patients or events*): The quality of evidence supporting stroke education is moderate. As noted above many of these studies were observational, experimental, or utilized mixed design. Bias is of concern with these approaches. Small sample sizes were often noted. Future studies should be large, have long follow-up, should use an intensive and repetitive approach, and involve patients' family and/or caregivers to fully evaluate the impact of stroke education on health outcomes (Maasland L, et al., 2011).

1c.7 Consistency of Results across Studies (*Summarize the consistency of the magnitude and direction of the effect*): The body of evidence reports mixed results regarding the effectiveness of various educational interventions and modalities (e.g., verbal, written, video, multi-media). Studies involving stroke patients have been conducted to evaluate the impact of health education on adverse events, adherence/compliance, health beliefs, behavior modification, retention and recall, patient satisfaction, and quality of life. Due to the variety of study approaches and the breadth of educational interventions, format and delivery styles, it can be difficult to compare study findings.

1c.8 Net Benefit (*Provide estimates of effect for benefit/outcome; identify harms addressed and estimates of effect; and net benefit - benefit over harms*):

There is strong evidence on the net benefits of stroke education. It is clear that stroke education compared to no education is beneficial. Knowledge of the warning signs and symptoms of stroke may reduce the incidence of having a second stroke by encouraging patients to seek medical intervention in a timely manner. The need for stroke education is paramount to empower stroke patients to recognize risk factors for and warning signs and symptoms of stroke. Trials involving patients with coronary artery disease have shown that health education results in lifestyle change; however, a beneficial effect in stroke patients on health behavior, risk reduction, or stroke outcome has not been proven.

Studies have also demonstrated that stroke education is cost effective. A randomized controlled trial of community-based educational programs for groups of nine stroke survivors and their family members and/or caregivers, held twice weekly for eight weeks by volunteers and qualified exercise instructors, found this approach to be a low-cost intervention (i.e., 296 pounds per patient; 95% CI pound 321 to pound 913)(Harrington R, et al., 2010). Economic costs were compared in cost-consequences model. Furthermore, physical integration was improved and maintained at one year, when compared with standard care. Similarly, a study from Chan and colleagues (2008) concluded that a 12-minute educational video shown in the emergency department was a valuable and low-cost tool for improving stroke knowledge. Immediately after viewing and even one month later, participants demonstrated improved stroke knowledge via test scores (6.7 +/- 2.5 to 9.5 +/- 2.6 (p < 0.01)).

Due to shifting economic realities and the rising cost of healthcare, stroke survivors today are discharged home from the hospital more quickly than in the past, despite significant impairments after discharge (Ostwald SK, et al., 2008). Stroke education provided to patients and caregivers prior to hospital discharge is therefore increasingly important to help keep patients in the home setting when possible rather than in higher cost healthcare settings.

1c.9 Grading of Strength/Quality of the Body of Evidence. Has the body of evidence been graded? **Yes**

1c.10 If body of evidence graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias: Canadian Stroke Network. During our systematic review, it was determined that the guideline developers accounted for a balanced representation of information, and provided information that was accessible and met the requirements set out in this measure maintenance form.

1c.11 System Used for Grading the Body of Evidence: Other

1c.12 If other, identify and describe the grading scale with definitions: Canadian Stroke Network; 2010 Dec 8. p. 129-150.

Literature Search –Number of Source Documents - a total of 699 studies were included.

Rating Scheme for the Strength of the Evidence

Summary of Definitions for Levels of Evidence*

Grade A – Criteria – Strong recommendation. Evidence from randomized controlled trials or meta-analysis

of randomized controlled trials. Desirable effects clearly outweigh undesirable effects, or vice versa. Grade B – Criteria – Single randomized controlled trial or well-designed cohort or case-control analytic study; or multiple time series or dramatic results of uncontrolled experiment. Desirable effects closely balanced with undesirable effects.

Grade C – Criteria – At least one well-designed, nonexperimental descriptive study (e.g., comparative studies, correlation studies, case studies) or expert committee reports, opinions and/or experience of respected authorities, including consensus from development and/or reviewer groups.

*Based on Guyatt GH, Cook DJ, Jaeschke R, et al. Grades of recommendation for antithrombotic agents: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th edition). [published erratum in Chest 2008;34:47]. Chest 2008;133(6 Suppl):123S-131S.

1c.13 Grade Assigned to the Body of Evidence: Evidence Level A/B

1c.14 Summary of Controversy/Contradictory Evidence: The benefit of stroke education is undisputed in terms of increasing awareness of stroke risk factors, signs and symptoms, the urgency of medical intervention, the importance of medication management, and the necessity of follow-up with a healthcare provider after hospital discharge. No position against educating stroke patients about these components was noted in the literature. However, there is contradictory evidence about patients' preference for educational format, delivery styles, and interventions, as well as, patient satisfaction with education provided, and the impact of stroke education on stroke outcomes. No optimal educational method or approach has been noted in the literature. More intervention studies of health education in stroke patients are needed.

1c.15 Citations for Evidence other than Guidelines(*Guidelines addressed below*):

- Anderson RT, Camacho F, Iaconi AI, Tegeler CH, Balkrishnan R. Enhancing the effectiveness of community risk screening: a randomized controlled trial. J Stroke Cerebrovasc Dis. 2011 Jul-Aug;20(4):330-335.
- Boysen G, Krarup LH, Oskedra A, Kõrv J, Andersen G, Gluud C, Pedersen A, Lindahl M, Hansen L, Winkel P, Truelsen T, ExStroke Pilot Trial Group. ExStroke Pilot Trial of the effect of repeated instructions to improve physical activity after ischemic stroke: a multinational randomized controlled clinical trial. BMJ. 2009;339:2810.
- Byers AM, Lamanna L, Rosenberg A. The effect of motivational interviewing after ischemic stroke on patient knowledge and patient satisfaction with care: a pilot study. J Neurosci Nurs. 2010 Dec;42(6):312-322.
- Chan YF, Lavery R, Fox N, Kwon R, Sinsuwadia S, Massone R, Liningsto D. Effect of an educational video on emergency department patient stroke knowledge. J Emerg Med. 2008 Feb;34(2):215-220.
- Chan YF, Nagurka R, Richardson LD, Zaets SB, Brimacombe MB, Levine SR. Effectiveness of stroke education in the emergency department waiting room. J Stroke Cerebrovasc Dis. 2010 May;19(3):209-215.
- Davis SM, Martinelli D, Braxton B, Kutrovac K, Crocco T. The impact of the extended parallel process model on stroke awareness: pilot results from a novel study. Stroke. 2009;40(12):3857-63.
- Dromerick AW, Gibbons MC, Edwards DF, Farr DE, Giannetti ML, Sánchez B, Shara NM, Fokar A, Jayam-Trouth A, Ovbiagele B, Kidwell CS. Preventing recurrence of thromboembolic events through coordinated treatment in the District of Columbia. Int J Stroke. 2011 Oct;6(5): 454-460.
- Eames S, Hoffman T, Worrall L, Read S. Delivery styles and formats for different stroke information topics: patient and carer preferences. Patient Educ Couns. 2011 Aug;84(2):e18-23.
- Eames S, Hoffman T, Worrall L, Read S. Stroke patients' and carers' perception of barriers to accessing stroke information. Top Stroke Rehabil. 2010 Mar-Apr;17(2):69-78.
- Hafsteisdottir TB, Vergunst M, Lindeman E, Schuurmans M. Educational needs of patients with a stroke and their caregivers: a systematic review of the literature. Patient Educ Couns. 2011 Oct; 85(1):14-25.

- Harrington R, Taylor G, Hollinghurst S, Reed M, Kay H, Wood VA. A community-based exercise and education scheme for stroke survivors: a randomized controlled trial and economic evaluation. Clin Rehabil. 2010 Jan;24(1):3-15.
- Maasland L, Brouwer-Goossensen D, den Hertog HM, Koudstaal, Dippel DW. Health education in patients with recent stroke or transient ischemic attack: a comprehensive review. Int J Stroke. 2011 Feb;6(1):67-74.
- Ostwald SK, Davis S, Hersch G, Kelley C, Goodwin KM. Evidence-based educational guidelines for stroke survivors after discharge home. J Neurosci Nurs. 2008 Jun;40(3):173-179.
- Smith J, Forster A, House A, Knapp P, Wright J, Young J. Information provision for stroke patients and caregivers. Cochrane Database Syst Rev. 2008 Apr 16;(2):CD00191.

1c.16 Quote verbatim, the specific guideline recommendation (Including guideline # and/or page #): 2010 Canadian Stroke Network Best Practices and Recommendations: Managing Stroke Care Transitions.

Evidence Level A

Stroke Survivor, family and caregiver education is an integral part of stroke care that must be addressed at all stages across the continuum and at all transition points of stroke care for both adult and pediatric patients. Patient and family education should include information sharing, teaching patients self-management skills, and training caregivers (page 5).

Evidence Level B

People with stroke living in the community should have regular and on-going follow-up to assess recovery, prevent deterioration, maximize functional and psychosocial outcomes, and improve quality of life (page 7).

2010 Canadian Stroke Network Best Practices and Recommendations: Public Awareness of Stroke.

Evidence Level B

All members of the public should be able to recognize the warning signs and symptoms of stroke, and react immediately by calling 911 or their local emergency number. Public education on stroke should emphasize that stroke is a medical emergency, and that immediate medical attention should be sought. All members of the public should know how to take appropriate actions – that is, to call 911 or their local emergency number (Page 5).

1c.17 Clinical Practice Guideline Citation: Lindsay MP, Gubitz G, Bayley M, Hill MD, Davies-Schinkel C, Singh S, Phillips S, Canadian Stroke Strategy Best Practices and Standards Writing Group. Canadian best practice recommendations for stroke care: managing stroke care transitions. Ottawa (ON): Canadian Stroke Network. 2010 Dec 8:129-150.

Lindsay MP, Gubitz G, Bayley M, Hill MD, Davies-Schinkel C, Singh S, Phillips S, Canadian Stroke Strategy Best Practices and Standards Writing Group. Canadian best practice recommendations for stroke care: public awareness of stroke. Ottawa (ON): Canadian Stroke Network. 2010 Dec 8:17-20.

1c.18 National Guideline Clearinghouse or other URL:

<http://www.guidelines.gov/content.aspx?id=34092&search=stroke+education>

1c.19 Grading of Strength of Guideline Recommendation. Has the recommendation been graded? **Yes**

1c.20 If guideline recommendation graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias: This guideline was developed by the Canadian Stroke Strategy (CSS) Best Practices and Standards Working Group and updated on December 8, 2010. An inter-professional group of experts in stroke care participated in the topic-specific task groups convened to review, draft, and revise recommendation statements for their topic. Members of the task groups included stroke neurologists, physiatrists, nurses, emergency physicians, paramedics, physical

therapists, occupational therapists, speech and language therapists, dietitians, pharmacists, stroke survivors, education experts, and professionals from other disciplines as required. This inter-professional approach ensured that all relevant health disciplines for a particular topic area were represented in the development of the recommendations. Every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

1c.21 System Used for Grading the Strength of Guideline Recommendation: Other

1c.22 If other, identify and describe the grading scale with definitions: Canadian Stroke Network; 2010 Dec 8. p. 129-150.

Literature Search –Number of Source Documents - a total of 699 studies were included.

Rating Scheme for the Strength of the Evidence

Summary of Definitions for Levels of Evidence*

Grade A – Criteria – Strong recommendation. Evidence from randomized controlled trials or meta-analysis of randomized controlled trials. Desirable effects clearly outweigh undesirable effects, or vice versa.

Grade B – Criteria – Single randomized controlled trial or well-designed cohort or case-control analytic study; or multiple time series or dramatic results of uncontrolled experiment. Desirable effects closely balanced with undesirable effects.

Grade C – Criteria – At least one well-designed, nonexperimental descriptive study (e.g., comparative studies, correlation studies, case studies) or expert committee reports, opinions and/or experience of respected authorities, including consensus from development and/or reviewer groups.

*Based on Guyatt GH, Cook DJ, Jaeschke R, et al. Grades of recommendation for antithrombotic agents: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th edition). [published erratum in Chest 2008;34:47]. Chest 2008;133(6 Suppl):123S-131S.

1c.23 Grade Assigned to the Recommendation: Evidence Level A/B

1c.24 Rationale for Using this Guideline Over Others: The Canadian Best Practice Guidelines are updated every two years to ensure that best practice recommendations remain current and are coordinated with other similar initiatives nationally and internationally. Following a detailed literature search for international stroke-related guidelines, the writing group applied the Appraisal of Guidelines Research and Evaluation (AGREE) tool to determine the quality of the guidelines. This tool is used to assess the process of guideline development based on six domains: identification of a clinical area to promote best practice, stakeholder involvement, rigor of development, clarity and presentation, applicability, and editorial independence.

Based on the NQF descriptions for rating the evidence, what was the developer's assessment of the quantity, quality, and consistency of the body of evidence?

1c.25 Quantity: High **1c.26** Quality: Moderate **1c.27** Consistency: Moderate

1c.28 Attach evidence submission form:

1c.29 Attach appendix for supplemental materials:

Was the threshold criterion, *Importance to Measure and Report*, met?

(1a & 1b must be rated moderate or high and 1c yes) Yes ☐ No ☒

Provide rationale based on specific subcriteria:

For a new measure if the Committee votes NO, then STOP.

For a measure undergoing endorsement maintenance, if the Committee votes NO because of 1b. (no opportunity for improvement), it may be considered for continued endorsement and all criteria need to be evaluated.

2. RELIABILITY & 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. (**evaluation criteria**)

Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. Testing information and results should be entered in the appropriate field. Supplemental materials may be referenced or attached in item 2.1. See [guidance on measure testing](#).

S.1 Measure Web Page (*In the future, NQF will require measure stewards to provide a URL link to a web page where current detailed specifications can be obtained*). Do you have a web page where current detailed specifications for this measure can be obtained? **Yes**

S.2 If yes, provide web page URL:

http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

2a. RELIABILITY. Precise Specifications and Reliability Testing: **H● M● L● I●**

2a1. Precise Measure Specifications. (*The measure specifications precise and unambiguous.*)

2a1.1 Numerator Statement (*Brief, narrative description of the measure focus or what is being measured about the target population, e.g., cases from the target population with the target process, condition, event, or outcome*):

Ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given educational material addressing all of the following:

1. Activation of emergency medical system
2. Need for follow-up after discharge
3. Medications prescribed at discharge
4. Risk factors for stroke
5. Warning signs and symptoms of stroke

2a1.2 Numerator Time Window (*The time period in which the target process, condition, event, or outcome is eligible for inclusion*):

Hospital Admission to discharge

2a1.3 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, codes with descriptors, and/or specific data collection items/responses*):

Five data elements are used to calculate the numerator:

- Education Addresses Activation of Emergency Medical System – Documentation that the patient/caregiver was given written instructions/educational materials that address the need for activation of the emergency medical system (EMS) if signs or symptoms of stroke occur.

Allowable values: Yes, No/UTD or unable to determine from medical record documentation.

- Education Addresses Follow-up After Discharge – Documentation that the patient/caregiver was given written instructions/educational materials that address the need for continuing medical care/follow-up with a physician/APN/PA after discharge.

Allowable values: Yes, No/UTD or unable to determine from medical record documentation.

- Education Addresses Medications Prescribed at Discharge– Documentation that the patient/caregiver was given written instructions/educational materials that address discharge medications.

Allowable values: Yes, No/UTD or unable to determine from medical record documentation.

- Education Addresses Risk Factors for Stroke – Documentation that the patient/caregiver was given written instructions/educational materials that address risk factors for stroke.

Allowable values: Yes, No/UTD or unable to determine from medical record documentation.

- Education Addresses Warning Signs and Symptoms of Stroke – Documentation that the patient/caregiver was given written instructions/educational materials that address warning signs and symptoms of stroke.

Allowable values: Yes, No/UTD or unable to determine from medical record documentation.

Patients are eligible for the numerator population when the allowable value equals “yes” for each of the five data elements.

2a1.4 Denominator Statement (*Brief, narrative description of the target population being measured*):
Ischemic stroke or hemorrhagic stroke patients discharged home

2a1.5 Target Population Category (*Check all the populations for which the measure is specified and tested if any*): Elderly

2a1.6 Denominator Time Window (*The time period in which cases are eligible for inclusion*):
Episode of care

2a1.7 Denominator Details (*All information required to identify and calculate the target population/denominator such as definitions, codes with descriptors, and/or specific data collection items/responses*):

Eight data elements are used to calculate the denominator:

1. Admission Date – The month, day and year of admission to acute inpatient care.
2. Birthdate - The month, day and year the patient was born.
3. 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.
4. Comfort Measures Only – The earliest day the physician/APN/PA documented comfort measures only after hospital arrival.
Allowable values: 1 (Day 0 or 1); 2 (Day 2 or after); 3 (Timing Unclear); 4 (Not Documented/UTD).
5. Discharge Date – The month day and year the patient was discharged from acute care, left against medical advice or expired during the stay.
6. Discharge Disposition – The place or setting to which the patient was discharged on the day of hospital discharge.
7. 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.
8. ICD-9-CM Principal Diagnosis Code - The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code associated with the diagnosis established after study to be chiefly responsible for occasioning the admission of the patient for this hospitalization.

Population: Discharges with ICD-9-CM Principal Diagnosis Code for ischemic or hemorrhagic stroke as defined in Appendix A, Table 8.1 or Table 8.2.

2a1.8 Denominator Exclusions (*Brief narrative description of exclusions from the target population*):

- Less than 18 years of age
- Length of Stay > 120 days
- Comfort measures only documented
- Enrolled in clinical trials related to stroke
- Admitted for elective carotid intervention

2a1.9 Denominator Exclusion Details (*All information required to identify and calculate exclusions from*

the denominator such as definitions, codes with descriptors, and/or specific data collection items/responses):

- 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 with Comfort Measures Only allowable value of 1 (Day 0 or 1), 2 (Day 2 or after), and 3 (Timing unclear) are excluded.
- Patients are excluded if "Yes" is selected for Clinical Trial.
- Patients with the following ICD-9-CM procedure codes, if medical record documentation states that the patient was admitted for the elective performance of this procedure are excluded: 00.61 Percutaneous angioplasty of extracranial vessel(s); 00.62 Percutaneous angioplasty of intracranial vessel(s); 00.63 Percutaneous insertion of carotid artery stent(s); 00.64 Percutaneous insertion of other extracranial artery stent(s); 00.65 Percutaneous insertion of intracranial vascular stent(s); 38.02 Embolectomy/thrombectomy of other vessels of head and neck; 38.12 Endarterectomy head and neck; 38.22 Percutaneous angioplasty; 38.30 Resection of vessel with anastomosis; 38.31 Intracranial vessel resection with anastomosis; 38.32 Resection of vessel of head and neck with anastomosis; 38.42 Resection of vessel of head and neck with replacement; 39.28 Extracranial-intracranial (EC-IC) vascular bypass; 88.41 Arteriography of cerebral arteries.

2a1.10 Stratification Details/Variables *(All information required to stratify the measure results including the stratification variables, codes with descriptors, definitions, and/or specific data collection items/responses):*

Not applicable, the measure is not stratified.

2a1.11 Risk Adjustment Type *(Select type. Provide specifications for risk stratification in 2a1.10 and for statistical model in 2a1.13):* No risk adjustment or risk stratification

2a1.12 If "Other," please describe:

2a1.13 Statistical Risk Model and Variables *(Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development should be addressed in 2b4.):*

N/A

2a1.14-16 Detailed Risk Model Available at Web page URL (or attachment). Include coefficients, equations, codes with descriptors, definitions, and/or specific data collection items/responses. Attach documents only if they are not available on a webpage and keep attached file to 5 MB or less. NQF strongly prefers you make documents available at a Web page URL. Please supply login/password if needed:

2a1.17-18. Type of Score: Rate/proportion

2a1.19 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

2a1.20 Calculation Algorithm/Measure Logic *(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; 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 Discharge Disposition
 - a. If Discharge Disposition equals 2, 3, 4, 5, 6, 7 the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
 - b. If Discharge Disposition equals 1, 8 continue processing and proceed to Comfort Measures Only.
3. Check Comfort Measures Only
 - a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Comfort Measures Only equals 1, 2, or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
 - c. If Comfort Measures Only equals 4, 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 initialize missing and education counters.
6. Initialize Missing Counter and Education Counter. Set both counters equal to zero. Continue processing and proceed to Education Addresses Activation of Emergency Medical System.
7. Check Education Addresses Activation of Emergency Medical System
 - a. If Education Addresses Activation of Emergency Medical System is missing, add one to the Missing Counter. Continue processing and proceed to Education Addresses Follow-up After Discharge.
 - b. If Education Addresses Activation of Emergency Medical System equals Yes, add one to the Education Counter. Continue processing and proceed to Education Addresses Follow-up After Discharge.
 - c. If Education Addresses Activation of Emergency Medical System equals No, continue processing and proceed to Education Addresses Follow-up After Discharge.
8. Check Education Addresses Follow-up After Discharge
 - a. If Education Addresses Follow-up After Discharge is missing, add one to the Missing Counter. Continue processing and proceed to Education Addresses Medications Prescribed At Discharge.
 - b. If Education Addresses Follow-up After Discharge equals Yes, add one to the Education Counter. Continue processing and proceed to Education Addresses Medications Prescribed At Discharge.
 - c. If Education Addresses Follow-up After Discharge equals No, continue processing and proceed to Education Addresses Medications Prescribed At Discharge.
9. Check Education Addresses Medications Prescribed At Discharge
 - a. If Education Addresses Medications Prescribed At Discharge is missing, add one to the Missing Counter. Continue processing and proceed to Education Addresses Risk Factors for Stroke.
 - b. If Education Addresses Medications Prescribed At Discharge equals Yes, add one to the Education Counter. Continue processing and proceed to Education Addresses Risk Factors for Stroke.
 - c. If Education Addresses Medications Prescribed At Discharge equals No, continue processing and proceed to Education Addresses Risk Factors for Stroke.

10. Check Education Addresses Risk Factors for Stroke
 - a. If Education Addresses Risk Factors for Stroke is missing, add one to the Missing Counter. Continue processing and proceed to Education Addresses Warning Signs and Symptoms of Stroke.
 - b. If Education Addresses Risk Factors for Stroke equals Yes, add one to the Education Counter. Continue processing and proceed to Education Addresses Warning Signs and Symptoms of Stroke.
 - c. If Education Addresses Risk Factors for Stroke equals No, continue processing and proceed to Education Addresses Warning Signs and Symptoms of Stroke.
11. Check Education Addresses Warning Signs and Symptoms of Stroke
 - a. If Education Addresses Warning Signs and Symptoms of Stroke is missing, add one to the Missing Counter. Continue processing and proceed to the Missing Counter.
 - b. If Education Addresses Warning Signs and Symptoms of Stroke equals Yes, add one to the Education Counter. Continue processing and proceed to the Missing Counter.
 - c. If Education Addresses Warning Signs and Symptoms of Stroke equals No, continue processing and proceed to the Missing Counter.
12. Check Missing Counter
 - a. If the Missing Counter is greater than zero, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If the Missing Counter equals zero, continue processing and proceed to Education Counter.
13. Check Education Counter
 - a. If the Education Counter is less than five, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
 - b. If the Education Counter equals five, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

2a1.21-23 Calculation Algorithm/Measure Logic Diagram URL or attachment:

Attachment
2zzd_STK8.pdf

2a1.24 Sampling (Survey) Methodology. If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate):

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

Hospitals performing quarterly sampling for STK must ensure that their Initial Patient Population and sample sizes meet the following conditions:

Quarterly Sample Size

Based on Initial Patient Population Size for the STK Measure Set

Hospital's Measure

Average Quarterly

Initial Patient Population Size "N"	Minimum Required
-------------------------------------	------------------

Sample Size

"n"

>= 900	180
226-899	20% of Initial Patient Population size
45-225	45
6-44	No sampling; 100% Initial Patient Population required
0-5	Submission of patient level data is not required; if submission occurs, 100% Initial Patient Population required

Monthly Sampling

Hospitals performing monthly sampling for STK must ensure that their Initial Patient Population and sample sizes meet the following conditions:

Monthly Sample Size

Based on Initial Patient Population Size for the STK Measure Set

Hospital's Measure**Average Monthly**

Initial Patient Population Size "N" Minimum Required

Sample Size

"n"

>= 300	60
76-299	20% of Initial Patient Population size
15-75	15
< 15	No sampling; 100% Initial Patient Population required

2a1.25 Data Source (Check all the sources for which the measure is specified and tested). If other, please describe:

Electronic Health Record (Only), Other, Paper Records

2a1.26 Data Source/Data Collection Instrument (Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.): 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.

2a1.27-29 Data Source/data Collection Instrument Reference Web Page URL or Attachment:

2a1.30-32 Data Dictionary/Code Table Web Page URL or Attachment:

URL

http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

2a1.33 Level of Analysis (Check the levels of analysis for which the measure is specified and tested):

Facility, Other

2a1.34-35 Care Setting (Check all the settings for which the measure is specified and tested): Hospital

2a2. Reliability Testing. (Reliability testing was conducted with appropriate method, scope, and adequate

demonstration of reliability.)

2a2.1 Data/Sample *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):*

This measure has been in national use since the 4th quarter of 2009. Demographics of organizations collecting and reporting data on this measure are as follows:

170 health care organizations representing various hospital demographics:

17 For Profit; 144 Not for Profit; 9 Government

62 >=300 beds; 71 100-299 beds; 37 <100 beds

142 Urban; 28 Rural

22 Teaching; 148 Non-teaching

States represented in this data collection effort include: AL, AR, AZ, CA, CT, FL, GA, IA, ID, IL, IN, KY, LA, MA, MD, MI, MN, MO, MS, NC, NE, NJ, NM, NY, OH, PA, PR, SC, SD, TN, TX, VA, WA, WI

15 performance measurement systems are used for data transmission to The Joint Commission.

2a2.2 Analytic Method *(Describe method of reliability testing & rationale):*

At the time this measure was originally tested, extensive tests of measure reliability were conducted. Pilot testing of this measure was conducted in 2004-2005 and consisted of a twelve month data collection period using a retrospective approach with monthly data transmission to The Joint Commission. To assess reliability, data were re-abstracted retrospectively by Joint Commission staff from a randomly selected sample of approximately 900 patient records identified at 30 pilot sites over the 12 month period. Results of re-abstraction were compared with original abstraction results in order to determine the rates of agreement. The objectives of pilot testing were to evaluate reliability of individual data elements, assess data collection effort and identify potential measure enhancements.

Currently, hospitals are supported in their data collection and reporting efforts by 15 contracted performance measurement system (PMS) vendors. It is a contractual requirement of Joint Commission listed vendors that the quality and reliability of data submitted to them by contracted health care organizations must be monitored on a quarterly basis. In addition, The Joint Commission analyzes these data by running 17 quality tests on the data submitted into ORYX. It is a requirement of participation in the ORYX initiative that data on all measures in the set are collected. (ORYX is the term used by The Joint Commission to describe the component of the hospital accreditation program which requires data collection and reporting on standardized national performance measures.) The following is a list of the major tests conducted on the submitted data for this measure:

- Transmission of complete data
- Usage of data received (to understand if the healthcare organization provides the relevant service to treat the relevant population)
- Investigation of aberrant data points
- Verification of patient population and sample size
- Identification of missing data elements
- Validation of the accuracy of target outliers
- Data integrity
- Data corrections

Data Element Agreement Rate:

Inter-rater reliability testing methodology utilized by contracted performance measure system vendors is as follows:

- All clinical data elements and all editable demographic elements are scored.
- All measure data are reabstracted with originally abstracted data having been blinded so that the reabstraction is not biased.

- Reabstracted data are compared with originally abstracted data on a data element by data element basis. A data element agreement rate is calculated. Clinical and demographic data are scored separately, and an overall agreement rate is computed.

2a2.3 Testing Results (*Reliability statistics, assessment of adequacy in the context of norms for the test conducted*):

Data element agreement rates reported to The Joint Commission for the time period of one year (4Q2010 – 3Q2011) have shown an overall agreement rate of 98.75%. This reflects the findings of 77 hospitals, comprising 739 records. The following table delineates calculated agreement rates for individual data elements that are used to compute measure rates for STK-8.

Data Elements	Total 'n' numerator	Total 'n' denominator	Rate
Clinical Trial	712	714	99.7%
Comfort Measures Only	709	714	99.3%
Elective Carotid Intervention	711	714	99.6%
Education Addresses Activation of the Emergency Medical System	315	334	94.3%
Education Addresses Follow-Up After Discharge	319	336	95.0%
Education Addresses Medications Prescribed at Discharge	312	336	92.9%
Education Addresses Risk Factors for Stroke	316	336	94.1%
Education Addresses Warning Signs and Symptoms of Stroke	316	336	94.1%

These agreement rates are considered to be well within acceptable levels.

2b. VALIDITY. Validity, Testing, including all Threats to Validity: H● M● L● I●

2b1.1 Describe how the measure specifications (*measure focus, target population, and exclusions*) **are consistent with the evidence cited in support of the measure focus (criterion 1c) and identify any differences from the evidence:**

This measure focuses on providing patients and/or their caregivers with written educational materials/instructions that address five components of stroke education: activation of the emergency medical system, follow-up after discharge, medications prescribed at discharge, risk factors for stroke, and warning signs and symptoms of stroke. Written materials include discharge instruction sheets, brochures, booklets, teaching sheets, videos, CDs, and DVDs provided to the patient/caregiver anytime during the hospital stay prior to discharge. Information provided to the patient should be personalized to meet the individual needs and preferences of the patient. Written materials are used to reinforce verbal instructions and information provided to the patient/caregiver, and promote recall after discharge. The five educational components are derived from currently available evidence and clinical practice guidelines.

Patients less than 18 years of age that have a length of stay (LOS) more than 120 days, enrolled in a clinical trial for stroke or who were designated "comfort measures only" anytime during hospitalization are excluded to harmonize with other CMS/Joint Commission measures. Operationally, patients with a planned admission to the hospital for an elective carotid intervention which restores blood flow to the brain and prevents stroke, such as carotid endarterectomy or carotid stenting, are excluded from the measure.

2b2. Validity Testing. (*Validity testing was conducted with appropriate method, scope, and adequate demonstration of validity.*)

2b2.1 Data/Sample (*Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included*):

As noted previously, this measure has been in national use since the 4th quarter of 2009. Demographics of organizations collecting and reporting data on these measures are as previously reported.

2b2.2 Analytic Method *(Describe method of validity testing and rationale; if face validity, describe systematic assessment):*

At the time this measure was originally tested measure validity was assessed via survey and focus groups of hospitals participating in the pilot test. All measure specifications, including population identification, numerator and denominator statements and exclusions, and data elements and their definitions were found to be understandable, retrievable, and relevant.

Since the measure has been in national use, continued validity of the measure has been determined through analysis of feedback from measure users. The Joint Commission provides a web-based application with which measure users can provide feedback regarding appropriateness of measure specifications, request clarification of specifications, and/or provide other comments pertinent to the measure. This feedback is systematically, continually, reviewed in order to identify trends and to identify areas of the measure specifications that require clarification or revision. Additionally, Joint Commission staff continually monitors the national literature and environment in order to assess continued validity of this measure. An expert technical advisory panel (TAP) meets on a quarterly basis in order to assess continued validity of this measure. And finally, the conversion from ICD-9-CM diagnosis codes to ICD-10-CM diagnosis codes has been completed and reviewed by the Technical Advisory Panel for validity. The panel has determined that the intent of the measure has not changed as a result of the conversion. The crosswalk will also be posted in a future version of the specifications manual for public comment, and results of feedback will be reviewed and incorporated into the measure specifications where indicated.

2b2.3 Testing Results *(Statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment):*

Analysis of feedback obtained via our automated feedback system reveals 36 submissions regarding specifications for this measure over the past year. Predominantly, questions involve the data element Education Addresses Medications Prescribed at Discharge. Questions pertaining to discharge medication list and discharge instruction possible mismatches are most common. Questions about personalized risk factors for stroke and follow-up after discharge are also received, although less frequently than questions about medication education. Abstraction guidelines for this data element have been aligned with definitions used for patient education data elements pertaining to medications in other core measure sets and clarification provided as identified through feedback received from users.

POTENTIAL THREATS TO VALIDITY. *(All potential threats to validity were appropriately tested with adequate results.)*

2b3. Measure Exclusions. *(Exclusions were supported by the clinical evidence in 1c or appropriately tested with results demonstrating the need to specify them.)*

2b3.1 Data/Sample for analysis of exclusions *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):*

As noted previously, this measure has been in national use since the 4th quarter of 2009. Demographics of organizations collecting and reporting data on these measures are as previously reported.

2b3.2 Analytic Method *(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference):*

Measure exclusions that were not derived directly from the evidence are presented below. Please note that these are population exclusions that are necessary to ensure consistency in all measures in this 8 measure set.

These exclusions were analyzed for frequency of occurrence. An issue that is of great concern to users of this measure is that due to the presence of exceptions to the measure, attainment of a 100% measure rate is not possible. Because of the role of this measure in the current Joint Commission accreditation process

this is especially troubling to measure users. This concern is the basis for a number of the non-evidence-based exclusions to these measures. The following measure exclusions that were not derived directly from the evidence are as follows:

1. Patients < 18 years old
2. Patients who have a length of stay (LOS) greater than 120 days
3. Patients with Comfort Measures Only documented
4. Patients enrolled in clinical trials
5. Patients admitted for Elective Carotid Intervention

2b3.3 Results (Provide statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses):

N=39,812

1. Patients < 18 years old = 0%
2. Patients who have a length of stay (LOS) greater than 120 days = 0%
3. Patients with Comfort Measures Only documented = 11.11%
4. Patients enrolled in clinical trials = 0.39%
5. Patients admitted for Elective Carotid Intervention = 9.96%

2b4. Risk Adjustment Strategy. (For outcome measures, adjustment for differences in case mix (severity) across measured entities was appropriately tested with adequate results.)

2b4.1 Data/Sample (Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):

Not Applicable

2b4.2 Analytic Method (Describe methods and rationale for development and testing of risk model or risk stratification including selection of factors/variables):

Not Applicable

2b4.3 Testing Results (Statistical risk model: Provide quantitative assessment of relative contribution of model risk factors; risk model performance metrics including cross-validation discrimination and calibration statistics, calibration curve and risk decile plot, and assessment of adequacy in the context of norms for risk models. Risk stratification: Provide quantitative assessment of relationship of risk factors to the outcome and differences in outcomes among the strata):

Not Applicable

2b4.4 If outcome or resource use measure is not risk adjusted, provide rationale and analyses to justify lack of adjustment: Not Applicable

2b5. Identification of Meaningful Differences in Performance. (The performance measure scores were appropriately analyzed and discriminated meaningful differences in quality.)

2b5.1 Data/Sample (Describe the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):

This measure has been in national use since the 4th quarter of 2009. Demographics of organizations collecting and reporting data on these measures are as previously reported.

2b5.2 Analytic Method (Describe methods and rationale to identify statistically significant and practically/meaningfully differences in performance):

The method used to analyze meaningful differences in performance at The Joint Commission is Target Analysis. The object of target analysis is to compare a health care organization's data against a comparative norm for the purpose of evaluating performance improvement opportunities. When an organization's performance level is statistically significantly different from a comparative norm, it is considered a statistical deviation. A statistical deviation may be desirable or undesirable depending on the

“direction of improvement” of the measure.

There are two components to the target analysis methodology used at The Joint Commission. Given the national average for a performance measure, a target range is constructed. Using generalized linear mixed models methodology (also known as hierarchical models), a predicted estimate of a HCO's performance, with a corresponding 95% confidence interval, is generated. This confidence interval is compared to the target range, to determine the HCO's rating. The estimate of the organization's true performance is based on both the data from that organization and on data from the entire set of reporting organizations.

2b5.3 Results (Provide measure performance results/scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningful differences in performance):

STK-8 Distribution of Measure Results

Quarter	#hospitals	Mean	SD	90th%	75th%	50th%	25th%	10th Percentile
3Q2011	153	0.87063	0.20511	1	1	0.95	0.82813	0.63636
2Q2011	151	0.84477	0.25137	1	1	0.94118	0.78571	0.61538
1Q2011	157	0.78146	0.3009	1	1	1	0.9	0.17647
4Q2010	133	0.81247	0.27621	1	1	0.92857	0.76923	0.44444
3Q2010	125	0.76875	0.30045	1	1	0.90476	0.69231	0.25
2Q2010	120	0.71995	0.33642	1	1	0.875	0.57836	0.02381
1Q2010	98	0.68884	0.3537	1	1	0.96923	0.85411	0.5
4Q2009	48	0.71271	0.35009	1	1	0.85714	0.60978	0

2b6. Comparability of Multiple Data Sources/Methods. (If specified for more than one data source, the various approaches result in comparable scores.)

2b6.1 Data/Sample (Describe the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):

Multiple data sources are not used for this measure.

2b6.2 Analytic Method (Describe methods and rationale for testing comparability of scores produced by the different data sources specified in the measure):

Not applicable

2b6.3 Testing Results (Provide statistical results, e.g., correlation statistics, comparison of rankings; assessment of adequacy in the context of norms for the test conducted):

Not applicable

2c. Disparities in Care: H M L I NA (If applicable, the measure specifications allow identification of disparities.)

2c.1 If measure is stratified for disparities, provide stratified results (Scores by stratified categories/cohorts): The measure is not stratified for disparities.

2c.2 If disparities have been reported/identified (e.g., in 1b), but measure is not specified to detect disparities, please explain:

Although some evidence exists that minorities are less likely to be knowledgeable of stroke risk factors, warning signs and symptoms of stroke, and the need for urgency of treatment, there are no plans to stratify the measure. The Joint Commission does not currently capture gender-specific data, or data elements for race or ethnicity because these data elements have not been shown to be reliably collectable due to the fact that no national standardized definitions exist for these data elements. Also, not all hospitals collect race and ethnicity. In the future, it may be feasible for The Joint Commission to explore how race and ethnicity and other relevant disparity data, might be collected reliably in the future.

2.1-2.3 Supplemental Testing Methodology Information:

Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met? (Reliability and Validity must be rated moderate or high) Yes ☒ No ☐
Provide rationale based on specific subcriteria:

If the Committee votes No, STOP

3. USABILITY

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (**evaluation criteria**)

C.1 Intended Actual/Planned Use (Check all the planned uses for which the measure is intended): Public Health/Disease Surveillance, Public Reporting, Quality Improvement (Internal to the specific organization), Regulatory and Accreditation Programs

3.1 Current Use (Check all that apply; for any that are checked, provide the specific program information in the following questions): Public Reporting, Public Health/ Disease Surveillance, Regulatory and Accreditation Programs, Quality Improvement (Internal to the specific organization)

3a. Usefulness for Public Reporting: H ☒ M ☒ L ☐ I ☐

(The measure is meaningful, understandable and useful for public reporting.)

3a.1. Use in Public Reporting - disclosure of performance results to the public at large (If used in a public reporting program, provide name of program(s), locations, Web page URL(s)). If not publicly reported in a national or community program, state the reason AND plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement: **[For Maintenance – If not publicly reported, describe progress made toward achieving disclosure of performance results to the public at large and expected date for public reporting; provide rationale why continued endorsement should be considered.]**

The Joint Commission has a longstanding commitment to providing meaningful information about the comparative performance of accredited organizations to the public. The Quality Check® Web site, www.qualitycheck.org, launched in 1996, fulfills this commitment. Among other things, Quality Check allows consumers to view or download free hospital performance measure results. Measure rates for STK-8 are included in the hospital performance measure results reported on Quality Check®.

The Paul Coverdell National Acute Stroke Registry (PCNASR) also collects and publicly reports STK-8 measure data. Established by Congress in 2001, PCNASR is funded by the Centers for Disease control and Prevention (CDC) through a cooperative agreement with state health departments. The state health departments work with participating hospitals to track the care of hospitalized stroke patients to improve the quality of acute stroke care from the onset of stroke through hospital discharge.

This STK-8 Stroke Education measure is included among the 15 clinical quality measures required for Stage 1 of the Meaningful Use of Electronic Health Record (EHR) Incentive Program requirements for eligible hospitals and CAHs. This measure also will become a component of CMS's Hospital Inpatient Quality Reporting (IQR) for FY 2015 with data collection to begin January 2013.

3a.2. Provide a rationale for why the measure performance results are meaningful, understandable, and useful for public reporting. If usefulness was demonstrated (e.g., focus group, cognitive testing), describe the data, method, and results: All measure specifications (e.g., numerator, denominator, exclusions, data elements and measure calculation algorithms) are standardized in order to produce

consistent measure results. Specifications are updated biannually based on feedback from vendors, and hospitals, as well as technical advisory member recommendations and updated clinical practice guidelines. Data are collected using data collection tools that have been verified by The Joint Commission to accurately collect measure data elements and compute measure rates according to the measure specifications. Quarterly data reported to The Joint Commission are subject to a number of data quality tests to ensure the accuracy of the data. The measure rate is computed using a standardized measure calculation algorithm.

The Joint Commission provides an opportunity for measure users to submit questions and feedback about the measure specifications via an on-line website. As discussed previously, this information is used to ensure continued measure usefulness and validity and to evaluate the need for revisions and provide users with a database of frequently asked questions. Measure updates and issues about the measures are presented and discussed at an annual performance measurement system vendor conference. These activities support the Joint Commission's effort to provide results that are useable, understandable and useful for public reporting.

3.2 Use for other Accountability Functions (payment, certification, accreditation). If used in a public accountability program, provide name of program(s), locations, Web page URL(s): The Joint Commission is a national (and international) accreditor of hospitals and other healthcare organizations. This measure set is one of 14 available measure sets which hospitals can select to meet The Joint Commission's ORYX accreditation program requirement for data collection and reporting. (Additional information located at: http://www.jointcommission.org/facts_about_oryx_for_hospitals/).

In addition, data collection for the eight stroke core measures is required to maintain Joint Commission Disease-Specific Care Advanced Primary Stroke Center certification status. Monthly data points (numerator and denominator values) for each stroke measure are self-submitted to The Joint Commission's certification database by the certified organization each calendar quarter. Certified primary stroke centers are also required to analyze their data and report annually regarding opportunities for improvement, actions taken, and variances detected.

3b. Usefulness for Quality Improvement: H● M● L● I●

(The measure is meaningful, understandable and useful for quality improvement.)

3b.1. Use in QI. If used in quality improvement program, provide name of program(s), locations, Web page URL(s):

[For Maintenance – If not used for QI, indicate the reasons and describe progress toward using performance results for improvement].

While The Joint Commission developed this measure for and uses results from this measure in its hospital accreditation and Disease-Specific Care certification activities, the measure is also intended for use in internal quality improvement by accredited organizations and certified primary stroke centers. More than 900 primary stroke centers certified by The Joint Commission utilize statistical process control charts accessed via The Joint Commission Connect™ secure-extranet site to trend longitudinal data for their organization over time. Trend reports of multi-state and national aggregate rates may also be accessed for internal quality improvement purposes.

The American Heart Association/American Stroke Association Get With The Guidelines-Stroke Program is another initiative to improve the quality of care for patients with stroke and transient ischemic attack. Healthcare organizations participating in the program also collect data on stroke education provided to patients, families, and caregivers as detailed in STK-8 measure specifications.

3b.2. Provide rationale for why the measure performance results are meaningful, understandable, and useful for quality improvement. If usefulness was demonstrated (e.g., QI initiative), describe the data, method and results:

Aggregate measure results have improved over time, indicating that they are being used by hospitals to

identify and address areas in need of improvement. Since STK-8 was introduced nationally in 2009, aggregate performance has increased from 74.4% to 89.5% for the most recent 2011 Quarter 3 reportable performance.

Overall, to what extent was the criterion, *Usability*, met? H M L I
Provide rationale based on specific subcriteria:

4. FEASIBILITY

Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (**evaluation criteria**)

4a. Data Generated as a Byproduct of Care Processes: H M L I

4a.1-2 How are the data elements needed to compute measure scores generated? (*Check all that apply*).

Data used in the measure are:

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

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.

4b. Electronic Sources: H M L I

4b.1 Are the data elements needed for the measure as specified available electronically (*Elements that are needed to compute measure scores are in defined, computer-readable fields*): Some data elements are in electronic sources

4b.2 If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources: The Joint Commission has been engaged in national efforts to retool measures for use with the EHR since their inception. The Health Information Technology Standards Panel (HITSP) received funding from HHS for a CMS sponsored project to retool the Joint Commission-developed Stroke (STK) measures, so that quality data could be captured directly from the EHR as a by-product of healthcare delivery. As a member of the HITSP Quality Tiger Team, The Joint Commission served as a resource in the retooling of the stroke measures. In the past year, and following public comment of the HITSP specifications, CMS convened a small workgroup to address issues with the HITSP specifications. The Joint Commission actively participated in this effort and provided extensive input to this process. The Joint Commission is currently being consulted to participate in a Quality Data Model (QDM)-based retooling effort of the stroke measures.

4c. Susceptibility to Inaccuracies, Errors, or Unintended Consequences: H M L I

4c.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to prevent, minimize, or detect. If audited, provide results:

No issues have been identified.

4d. Data Collection Strategy/Implementation: H M L I

A.2 Please check if either of the following apply (*regarding proprietary measures*):

4d.1 Describe what you have learned/modified 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 (e.g., fees for use of proprietary measures):

At the time this measure was originally tested in 2004-2005, TIA patients were included in the measure population. Test findings indicated that TIA patients could not be reliably identified using available ICD-9-CM coding, leading to noise in measure results. Therefore, TIA patients were removed from the final measure upon the recommendation of our Technical Advisory Panel.

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.

Overall, to what extent was the criterion, *Feasibility*, met? H ☐ M ☐ L ☐ I ☐

Provide rationale based on specific subcriteria:

OVERALL SUITABILITY FOR ENDORSEMENT

Does the measure meet all the NQF criteria for endorsement? Yes ☐ No ☐

Rationale:

If the Committee votes No, STOP.

If the Committee votes Yes, the final recommendation is contingent on comparison to related and competing measures.

5. COMPARISON TO RELATED AND 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 before a final recommendation is made.

5.1 If there are related measures (either same measure focus or target population) or competing measures (both the same measure focus and same target population), list the NQF # and title of all related and/or competing measures:

5a. Harmonization

5a.1 If this measure has EITHER the same measure focus OR the same target population as [NQF-endorsed measure\(s\)](#): Are the measure specifications completely harmonized?

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

5b. Competing Measure(s)

5b.1 If this measure has 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):

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner): The Joint Commission, One Renaissance Boulevard, Oakbrook Terrace, Illinois, 60181

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, One Renaissance Boulevard, Oakbrook Terrace, Illinois, 60181

Co.4 Point of Contact: Jerod, Loeb, PhD, jloeb@jointcommission.org, 630-792-5920-

Co.5 Submitter: Ann, Watt, MBA, RHIA, awatt@jointcommission.org, 630-792-5944-, The Joint Commission

Co.6 Additional organizations that sponsored/participated in measure development:
The stroke measure set was developed in collaboration with the American Heart Association/American Stroke Association. Input was also provided by the U.S. Centers for Disease Control and Prevention Paul Coverdell National Acute Stroke Registry.

Co.7 Public Contact: Karen, Kolbusz, RN, BSN, MBA, kkolbusz@jointcommission.org, 630-792-5931-, The Joint Commission

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development

Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

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St. Luke's Brain and Stroke Institute
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Medical College of Wisconsin
Froedtert Hospital
Milwaukee, WI

Richard D. Zorowitz, MD
The Johns Hopkins University School of Medicine
Johns Hopkins Bayview Medical Center

Baltimore, MD
Ad.2 If adapted, provide title of original measure, NQF # if endorsed, and measure steward. Briefly describe the reasons for adapting the original measure and any work with the original measure steward: Not applicable.
Measure Developer/Steward Updates and Ongoing Maintenance Ad.3 Year the measure was first released: 2009 Ad.4 Month and Year of most recent revision: 01, 2013 Ad.5 What is your frequency for review/update of this measure? Biannual Ad.6 When is the next scheduled review/update for this measure? 07, 2013
Ad.7 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.8 Disclaimers:
Ad.9 Additional Information/Comments:
Date of Submission (MM/DD/YY): 05/04/2012