NATIONAL QUALITY FORUM

Measure Evaluation 4.1
December 2009

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

(for NQF staff use) **NQF Review #:** 1531 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** Follow-up assessment of stroke or death after carotid revascularization
De.2 **Brief description of measure:** Proportion of patients with carotid revascularization procedures who had follow-up performed for evaluation of death and neurologic assessment with an NIH Stroke Scale (by an examiner who is certified by the American Stroke Association) between 14 and 60 days after the procedure.
1.1-2 **Type of Measure:** Process De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** N/A
De.4 **National Priority Partners Priority Area:** Care coordination, Safety De.5 **IOM Quality Domain**: Effectiveness, Safety, Timeliness De.6 **Consumer Care Need:** Getting better, Staying healthy, Living with illness

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.* A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes A.2 **Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:** A.3 **Measure Steward Agreement:** Agreement will be signed and submitted prior to or at the time of measure submission A.4 **Measure Steward Agreement attached:** NQF - signed.pdf	**A** Y☐ N☐

B. The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section	**B** Y☐ N☐
C. The intended use of the measure includes both public reporting and quality improvement. ►**Purpose:** Payment Program, Regulatory and Accreditation Programs	**C** Y☐ N☐
D. The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement. D.1**Testing:** Yes, fully developed and tested D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?** Yes	**D** Y☐ N☐
(for NQF staff use) **Have all conditions for consideration been met?** **Staff Notes to Steward** (*if submission returned*)**:**	**Met** Y☐ N☐
Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**	
Staff Reviewer Name(s):	

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
1. IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance. ***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**	**Eval Rating**
(for NQF staff use) **Specific NPP goal**:	
1a.1 **Demonstrated High Impact Aspect of Healthcare:** Affects large numbers, Frequently performed procedure, Leading cause of morbidity/mortality, High resource use, Severity of illness 1a.2 1a.3 **Summary of Evidence of High Impact:** It is estimated that almost 800,000 people experience a new or recurrent stroke each year. Approximately 610,000 of these are first attacks. Stroke accounted for 1 of every 18 deaths in the US in 2006. The mean lifetime cost of ischemic stroke in the US is estimated at $140,048. Carotid endarterectomy (CAE) and carotid artery stenting (CAS) are effective procedures to prevent stroke. CAE is the most frequently performed surgical procedure to prevent stroke. In 2006, an estimated 99,000 carotid endarterectomy procedures were performed. 1a.4 **Citations for Evidence of High Impact:** American Heart Association. Heart disease and stroke statistics-2010 update: A report of the American Heart Association. Available at: http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.109.192667v1. Accessed December 3, 2010.	**1a** C☐ P☐ M☐ N☐
1b. Opportunity for Improvement 1b.1 **Benefits (improvements in quality) envisioned by use of this measure:** This measure is intended to assess rates of follow-up for death or stroke following carotid revascularization in order to allow hospitals to benchmark their rates of follow-up against the registry aggregate so that poor performers can engage in	**1b** C☐ P☐ M☐ N☐

quality improvement efforts to improve performance. Improvement in performance for this measure will improve surveillance for important outcomes, and subsequently allow for improvement in outcomes.

The risk of stroke and death after carotid revascularization are important and can substantially influence the net benefit of the procedure. Assessment and reporting of the "outcome" of stroke for carotid revascularization procedures is not consistent in the absence of a clinical assessment using a standardized stroke scale, or by using claims data. Since all patients have a clinic/office follow-up visits as a follow-up to revascularization procedures, this provides the opportunity for appropriate clinical assessment for key revascularization endpoints, including stroke or death. A process measure that uses a standard assessment of "neurologic evaluation", by an examiner who is certified by the American Stroke Association, is a measure that provides feedback on the ability to clearly and accurately assess for, capture and report the incidence of stroke after carotid revascularization procedures.

When centers that perform carotid revascularization properly assess patients for adverse events (particularly for stroke) after carotid revascularization, they trigger further evaluation, if necessary. If the 30 day NIH stroke scale is (1) changed from baseline; or (2) abnormal in absence of a baseline, pre-procedure exam, then there should be some documentation on whether or not the abnormal stroke scale represents a new clinical neurological event, and should result in an evaluation by a neurologist.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
Data from CARE registry:
Mean: 20.6
10th percentile: 0
Lower quartile: 0
Median: 11.0%
Upper quartile: 34.1%
90th percentile: 61.4%

Procedural volume varied greatly by tertile of performance:
Tertile 1: 63.1 procedures
Tertile 2: 132.3 procedures
Tertile 3: 101.2

1b.3 Citations for data on performance gap:
Unpublished NCDR data

1b.4 Summary of Data on disparities by population group:
Data from the NCDR CARE registry showed little variation in performance for this measure based on % of white patients, gender, or insurance status (percent of patients with no insurance).

Percent white:
Tertile 1: 93.0
Tertile 2: 90.9
Tertile 3: 91.8
p-value:0.663

Percent female:
Tertile 1: 40.7
Tertile 2: 41.6
Tertile 3: 34.1
p-value: 0.022

Percent with no insurance:
Tertile 1: 4.3
Tertile 2: 4.6
Tertile 3: 4.0

1b.5 Citations for data on Disparities:
Unpublished NCDR data.

1c. Outcome or Evidence to Support Measure Focus

1c.1 Relationship to Outcomes (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** This measure is a process measure to assess rates of follow-up for important outcomes related to carotid revascularization.

1c.2-3. Type of Evidence: Evidence-based guideline, Randomized controlled trial

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
The risk of stroke and death after carotid revascularization are important and can substantially influence the net benefit of the procedure. Assessment and reporting of the "outcome" of stroke for carotid revascularization procedures is not consistent in the absence of a clinical assessment using a standardized stroke scale, or by using claims data. Since all patients have a clinic/office follow-up visits as a follow-up to revascularization procedures, this provides the opportunity for appropriate clinical assessment for key revascularization endpoints, including stroke or death. A process measure that uses a standard assessment of "neurologic evaluation", by an examiner who is certified by the American Stroke Association, is a measure that provides feedback on the ability to clearly and accurately assess for, capture and report the incidence of stroke after carotid revascularization procedures.

When centers that perform carotid revascularization properly assess patients for adverse events (particularly for stroke) after carotid revascularization, they trigger further evaluation, if necessary. If the 30 day NIH stroke scale is (1) changed from baseline; or (2) abnormal in absence of a baseline, pre-procedure exam, then there should be some documentation on whether or not the abnormal stroke scale represents a new clinical neurological event, and should result in an evaluation by a neurologist.

According to the CARE Registry institutional outcomes reports, the median length of stay for CAS and CEA procedures is one day. This short hospital stay reflects difficulty in reporting "in-hospital" stroke outcomes as a relevant measure. The primary endpoints of major contemporary trials used 30 day events (stroke, MI* or death) and included neurologic evaluation to identify stroke. Based on trial endpoints, 30 day outcomes have greater importance. These trials include:

1. Stenting and Angioplasty with Protection in Patients at High Risk for Endarterectomy (SAPPHIRE) Trial
2. Asymptomatic Carotid Atherosclerosis Study (ACAS) Trial
3. SPACE (stent-protected angioplasty versus carotid endarterectomy in symptomatic patients) trial
4. Endarterectomy versus Stenting in Patients with Symptomatic Severe Carotid Stenosis (EVA-3S) Trial
5. Carotid Revascularization Endarterectomy vs. Stenting (CREST) Trial

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom*)**:**
None specifically relating this practice to outcomes.

1c.6 Method for rating evidence: None

1c.7 Summary of Controversy/Contradictory Evidence: None

1c.8 Citations for Evidence (*other than guidelines*)**:**
1 David C. Costs and cost-effectiveness of carotid stenting vs. endarterectomy for patients at increased surgical risk: Results from the SAPPHIRE trial. Catheter Cardiovasc Interv. 2010;
2 Mantese VA, Timaran CH, Chiu D, et al. The Carotid Revascularization Endarterectomy versus Stenting Trial (CREST): stenting versus carotid endarterectomy for carotid disease. Stroke. 2010;41:S31-S34.
3 Mas JL, Trinquart L, Leys D, et al. Endarterectomy Versus Angioplasty in Patients with Symptomatic Severe Carotid Stenosis (EVA-3S) trial: results up to 4 years from a randomised, multicentre trial. Lancet Neurol. 2008;7:885-92.
4 Mast H, Chambless LE, Mohr JP, et al. [Indications for endarterectomy in asymptomatic stenoses of the internal or common carotid artery--results of the North American ACAS Study]. Zentralbl Chir. 1996;121:1033-5.

1c
C ☐
P ☐
M ☐
N ☐

5. Ringleb PA, Hacke W. [Stent and surgery for symptomatic carotid stenosis. SPACE study results]. Nervenarzt. 2007;78:1130-7.

1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number***):**
Clinical Competence Statement on Carotid Stenting: Training and Credentialing for Carotid Stenting—Multispecialty Consensus Recommendations:
"Monitoring of outcomes with independent post-procedural neurological assessment using standardized instruments and definitions is critically important to ensure high-quality intervention and patient safety. Institutions offering carotid stent placement must have a quality assurance program specifically designed to assess the results of carotid interventions in their locale. The integrity and accuracy of outcome reporting is reliant on the incorporation of mandatory independent and objective neurologic assessment by a qualified and NIH Stroke Scale-certified individual for all patients undergoing carotid stenting."

The 2010 AHA/ASA Guidelines for the Prevention of Stroke in Patients With Stroke or Transient Ischemic Attack recommend considering risk status in decision-making for CAS and CEA:

1. For patients with recent TIA or ischemic stroke within the past 6 months and ipsilateral severe (70% to 99%) carotid artery stenosis, CEA is recommended if the perioperative morbidity and mortality risk is estimated to be <6% (Class I; Level of Evidence A).
2. For patients with recent TIA or ischemic stroke and ipsilateral moderate (50% to 69%) carotid stenosis, CEA is recommended depending on patient-specific factors, such as age, sex, and comorbidities, if the perioperative morbidity and mortality risk is estimated to be <6% (Class I; Level of Evidence B).
7. CAS in the above setting is reasonable when performed by operators with established periprocedural morbidity and mortality rates of 4% to 6%,similar to those observed in trials of CEA and CAS (Class IIa; Level of Evidence B).

1c.10 Clinical Practice Guideline Citation: 1.Rosenfield K, Babb JD, Cates CU, et al. Clinical competence statement on carotid stenting: training and credentialing for carotid stenting--multispecialty consensus recommendations: a report of the SCAI/SVMB/SVS Writing Committee to develop a clinical competence statement on carotid interventions. JACC. 2005; 45:165-74.
2. Bates, ER, et al. 2007 Clinical Expert Consensus Document on Carotid Stenting A Report of the American College of Cardiology Foundation Task Force on Clinical Expert Consensus Documents (ACCF/SCAI/SVMB/SIR/ASITN Clinical Expert Consensus Document Committee on Carotid Stenting), JACC, 2007 Vol. 49, No. 1, 126-170.

3. Furie KL, Kasner SE, Adams RJ, 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; 2010. Available at: http://stroke.ahajournals.org/cgi/reprint/STR.0b013e3181f7d043v1.

1c.11 National Guideline Clearinghouse or other URL:

1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom***):**
None specifically recommending this practice.

1c.13 Method for rating strength of recommendation (*If different from USPSTF system, also describe rating and how it relates to USPSTF)***:**
None

1c.14 Rationale for using this guideline over others:

TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report?*	**1**
Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, met? **Rationale:**	**1** **Y☐** **N☐**

2. 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)	Eval Rating
2a. MEASURE SPECIFICATIONS	
S.1 Do you have a web page where current detailed measure specifications can be obtained? **S.2 If yes, provide web page URL:** **2a. Precisely Specified**	
2a.1 Numerator Statement (*Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome*)**:** Patients with documentation of a follow-up assessment between 14 and 60 days after the date of carotid revascularization for both: 1. Neurologic status with an assessment using the NIH Stroke Scale (by an examiner who is certified by the American Stroke Association), AND 2. Vital Status (alive or expired) **2a.2 Numerator Time Window** (*The time period in which cases are eligible for inclusion in the numerator*)**:** 1 year **2a.3 Numerator Details** (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*)**:** Patient status= alive or deceased Follow-up NIH Stroke Scale Administered= yes. Supporting definitions: The NIHSS is a standardized neurological examination for patients with acute ischemic stroke that quantitatively measures the level of stroke severity. Examiner certified= yes Supporting definitions: The Stroke Scale assessment should be conducted by someone other than the operator for the current procedure. Note - NIHSS examiners may become certified through the American Stroke Association. NIH Stroke Scale Certification is currently available online free of charge: http://learn.heart.org/ihtml/application/student/interface.heart2/nihss.html	
2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured*)**:** Patients with carotid revascularization (surgery or stent) procedures **2a.5 Target population gender:** Female, Male **2a.6 Target population age range:** 18 and over **2a.7 Denominator Time Window** (*The time period in which cases are eligible for inclusion in the denominator*)**:** 1 year **2a.8 Denominator Details** (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions*)**:** Carotid artery stenting or carotid endarterectomy procedure performed.	
2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population*)**:** Patients with pre-procedure conditions of: 1. Acute evolving stroke, or 2. Carotid artery dissection	**2a-specs** C☐ P☐ M☐ N☐

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
1. Acute evolving stroke (ongoing at the time of the procedure)= yes
Supporting definition:
Acute evolving stroke includes all of the following:
- Any sudden development of neurological deficits attributable to cerebral ischemia and/or infarction.
-Onset of symptoms occurring within prior three days and ongoing at time of procedure.
-The event is marked by progressively worsening symptoms.
Note: Possible symptoms include, but are not limited to the following: numbness or weakness of the face or body; difficulty speaking or understanding; blurred or decreased vision; dizziness; or loss of balance and coordination.

2. Procedure indication of spontaneous carotid artery dissection= yes
Supporting definition:
Indicate if the patient has had a spontaneous carotid artery dissection prior to the current procedure.

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

2a.12-13 Risk Adjustment Type:

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
N/A

2a.15-17 Detailed risk model available Web page URL or attachment:

2a.18-19 Type of Score: Rate/proportion
2a.20 Interpretation of Score: Better quality = Higher score
2a.21 Calculation Algorithm (*Describe the calculation of the measure as a flowchart or series of steps***):**
Denominator calculation:
1. Count of patients with arrival/discharge dates from data submissions that pass NCDR data inclusion thresholds
2. Exclude patients with acute evolving stroke pre-procedure
3. Exclude patients with spontaneous carotid artery dissection pre-procedure

Numerator calculation:
1. From denominator population, count of patients with one of the following between 14 and 60 days:
-Follow-up NIH stroke Scale administered=yes, and "examiner certified"=yes
2. Patient status= deceased or follow-up patient status= alive or deceased

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
Hospital performance for this measure is benchmarked each quarter and annually against the CARE Registry aggregate. These benchmarks identify superior performance and encourage poorer performers to improve. The methodology is a data-driven, peer-group performance feedback used to positively affect outcomes.

2a.23 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)*:
N/A

2a.24 Data Source (*Check the source(s) for which the measure is specified and tested***)**
Electronic Clinical Data : Registry

2a.25 Data source/data collection instrument (*Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
National Cardiovascular Data Registry (NCDR)® CARE Registry®

2a.26-28 Data source/data collection instrument reference web page URL or attachment: URL
http://www.ncdr.com/WebNCDR/CAROTIDSTENT/ELEMENTS.ASPX

2a.29-31 Data dictionary/code table web page URL or attachment: URL
http://www.ncdr.com/WebNCDR/CAROTIDSTENT/ELEMENTS.ASPX

2a.32-35 Level of Measurement/Analysis (*Check the level(s) for which the measure is specified and tested)*
Facility

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Ambulatory Care : Clinic/Urgent Care, Ambulatory Care : Clinician Office, Hospital/Acute Care Facility

2a.38-41 Clinical Services (*Healthcare services being measured, check all that apply*)
Clinicians: PA/NP/Advanced Practice Nurse, Clinicians: Physicians (MD/DO)

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)*: Data were compared for 33 hospitals with 30 or more procedures for a 12 month period from January 2009 to December 2009 and from January 2010 and January 2010.

2b.2 Analytic Method *(type of reliability & rationale, method for testing)*:
Results were compared for two proximate time periods: January 2009 to December 2009 and from January 2010 to December 2010. Hospitals were excluded if they did not have data for both time periods, or if they did not perform 30 or more procedures during this time period. A simple scatter plot to assess correlation of follow-up rates for these hospitals for the 2 time periods was developed, as well as a Bland-Altman plot to show the range of hospital change in performance for these two time periods.

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:
Se supplemental documents. The Pearson correlation coefficient observed was 0.78. The average change in performance was -0.018, with a 95% confidence interval of 0.347 to 0.311, showing very good reliability of data over time.

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 Data/sample *(description of data/sample and size)*: Face/content validity: review of relevant evidence and guidelines and expert panel consensus process

2c.2 Analytic Method *(type of validity & rationale, method for testing)*:
Face/content validity was established to ensure this measure represented an important aspect of cardiovascular care for which improvement is needed.

2c.3 Testing Results *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
A review of the relevant evidence and guidelines and expert panel consensus process resulted in the conclusion that this is a valid measure of quality of cardiovascular care for patients following carotid revascularization.

2c C☐ P☐ M☐ N☐

2d. Exclusions Justified

2d.1 Summary of Evidence supporting exclusion(s):

2d.2 Citations for Evidence:

2d.3 Data/sample *(description of data/sample and size)*:

2d.4 Analytic Method *(type analysis & rationale)*:

2d C☐ P☐ M☐ N☐ NA☐

2d.5 **Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:	
2e. Risk Adjustment for Outcomes/ Resource Use Measures 2e.1 **Data/sample** *(description of data/sample and size)*: N/A 2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*: N/A 2e.3 **Testing Results** *(risk model performance metrics)*: N/A 2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:** N/A	**2e** C☐ P☐ M☐ N☐ NA ☐
2f. Identification of Meaningful Differences in Performance 2f.1 **Data/sample from Testing or Current Use** *(description of data/sample and size)*: 15,483 patient records from 156 hospitals in the CARE registry from 2005 to 2010. 2f.2 **Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*: Distribution of performance by percentile to demonstrate variability across hospitals. 2f.3 **Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*: Mean: 20.6 10th percentile: 0 Lower quartile: 0 Median: 11.0% Upper quartile: 34.1% 90th percentile: 61.4%	**2f** C☐ P☐ M☐ N☐
2g. Comparability of Multiple Data Sources/Methods 2g.1 **Data/sample** *(description of data/sample and size)*: N/A 2g.2 **Analytic Method** *(type of analysis & rationale)*: N/A 2g.3 **Testing Results** *(e.g., correlation statistics, comparison of rankings)*: N/A	**2g** C☐ P☐ M☐ N☐ NA ☐
2h. Disparities in Care 2h.1 **If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: No disparities have been reported for this measure. 2h.2 **If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**	**2h** C☐ P☐ M☐ N☐ NA ☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties?*	**2**
Steering Committee: Overall, to what extent was the criterion, *Scientific Acceptability of Measure Properties*, met? **Rationale:**	***2*** C☐ P☐ M☐

	N☐
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)	**Eval Rating**
3a. Meaningful, Understandable, and Useful Information 3a.1 **Current Use:** In use 3a.2 **Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*)**:** ACCF plans to begin voluntary public reporting of NCDR measures, including this measure, by 2012. ACCF is currently evaluating public reporting options and finalizing decisions related to location and display of information to be reported as well as communication plans. 3a.3 **If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):** This measure is used for QI by NCDR CARE Registry participating institutions. As of October 2010, 174 institutions are enrolled in the CARE registry. Participating institutions receive an institutional outcomes report each quarter with their hospital´s data. This metric is included in the CARE registry outcomes report (to be updated with current specifications in the next outcomes report version). These metrics are selected by an NCDR panel of experts as presenting the greatest opportunity for care improvement. Hospitals receive their measure score on all metrics, as well as the overall rate for all hospitals in the CARE registry, and the median rate. **Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*) 3a.4 **Data/sample** *(description of data/sample and size)***:** None 3a.5 **Methods** *(e.g., focus group, survey, QI project)***:** None 3a.6 **Results** *(qualitative and/or quantitative results and conclusions)***:** None	**3a** C☐ P☐ M☐ N☐
3b/3c. Relation to other NQF-endorsed measures 3b.1 **NQF # and Title of similar or related measures:**	
(for NQF staff use) **Notes on similar/related endorsed or submitted measures:**	
3b. Harmonization If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population): 3b.2 **Are the measure specifications harmonized? If not, why?**	**3b** C☐ P☐ M☐ N☐ NA ☐
3c. Distinctive or Additive Value 3c.1 **Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:** 5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the**	**3c** C☐ P☐ M☐ N☐ NA

same target population), Describe why it is a more valid or efficient way to measure quality:	☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability?*	**3**
Steering Committee: Overall, to what extent was the criterion, *Usability*, met? **Rationale:**	**3** **C☐** **P☐** **M☐** **N☐**
4. FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria)	**Eval Rating**
4a. Data Generated as a Byproduct of Care Processes **4a.1-2 How are the data elements that are needed to compute measure scores generated?** Data generated as byproduct of care processes during care delivery (Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition), Coding/abstraction performed by someone other than person obtaining original information (E.g., DRG, ICD-9 codes on claims, chart abstraction for quality measure or registry)	**4a** **C☐** **P☐** **M☐** **N☐**
4b. Electronic Sources **4b.1 Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*) Yes **4b.2 If not, specify the near-term path to achieve electronic capture by most providers.**	**4b** **C☐** **P☐** **M☐** **N☐**
4c. Exclusions **4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?** No **4c.2 If yes, provide justification.**	**4c** **C☐** **P☐** **M☐** **N☐** **NA** ☐
4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences **4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.** The NCDR program takes a number of steps to minimize any potential for inaccuracies or errors in data used to report on performance back to hospitals. The process begins with support to data abstractors, including webinars, meetings, resource guides on the website, and clinical quality consultants available via e-mail or toll free phone number, to ensure consistent data collection. The NCDR establishes a unified electronic platform for data capture and submission that includes a certification process of the technical data collection tool selected by the hospital (either a commercially available software vendor product, the NCDR´s own web-based data collection tool, or a hospital´s customized electronic medical record system) that must occur prior to any data submissions. The certification process provides edit checks of data elements within the data collection tool to ensure a high quality data submission. The NCDR data submission process includes a Data Quality Report (DQR) process that checks for validity in submissions based upon predetermined thresholds for element and composite completeness. The NCDR is putting in place a new strategy to systematically review the DQR results. The NCDR on-site audit program has been developed to assess the reliability of data abstraction. This annual process reviews key elements at a select number of patient reports at a select number of sites and provides	**4d** **C☐** **P☐** **M☐** **N☐**

feedback scores to the hospitals. The NCDR audit currently includes the ICD and CathPCI registries. However, the CARE registry will be included in the NCDR audit program in 2011. Any elements deemed critical to capture for this measure will be added upon NQF endorsement.

4e. Data Collection Strategy/Implementation

4e.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/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:
Beta testing with a sample of registry participants takes place with each new registry version to identify errors in the data collection tool. In addition, modifications are made to metrics based on feedback during a public comment period.

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file are automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:

Schema: Structure doesn´t match NCDR requirements
Dates: Inconsistent dates
Selection: Missing or mismatched data; can be parent/child errors where a field requests more data
Outlier: Anomalies or exceptions; data exceeds the possible limits.

4e.2 Costs to implement the measure (*costs of data collection, fees associated with proprietary measures*)**:**
CARE registry participants pay a fee of $3,685/year (as of 2010) to enroll in the registry. Staff resources are needed for data collection and submission at the participating institution. Registry site managers/data collectors undergo (non-mandatory) training offered by the NCDR.

4e.3 Evidence for costs:
http://www.ncdr.com/WebNCDR/ncdrdocuments/B08352N%20CARE%20Registry%20Enrollment%20Packet%20Complete.pdf

4e.4 Business case documentation:

4e
C☐ P☐ M☐ N☐

TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility?*

4

Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met?
Rationale:

4
C☐ P☐ M☐ N☐

RECOMMENDATION

(for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.**

Time-limited ☐

Steering Committee: Do you recommend for endorsement?
Comments:

Y☐ N☐ A☐

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner)
Co.1 Organization
American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037

Co.2 **Point of Contact**
Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529-

Measure Developer If different from Measure Steward
Co.3 **Organization**
American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037

Co.4 **Point of Contact**
Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529-

Co.5 **Submitter If different from Measure Steward POC**
Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529-, American College of Cardiology Foundation (ACCF)

Co.6 **Additional organizations that sponsored/participated in measure development**
Society for Cardiac Angiography and Interventions (SCAI)

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.**
CARE Registry Steering Committee:
Christopher J. White, MD, FSCAI, FACC, FAHA, FESC
H. Vernon (Skip) Anderson, MD, FACC, FSCAI, FAHA
Kenneth Rosenfield, MD, FSCAI, FACC, FAHA
David J. Cohen, MD, MSc
Michael R. Jaff, DO, FACP, FACC, FAHA (SVMB)
Kalon Ho, MD, MSc, FACC, FACP, FSCAI, FAHA
Alex Abou-Chebl, MD
Robert M. Bersin, MD
Walter Koroshetz, MD, FAAN
William Gray,MD

Public Reporting Workgroup:
Fred Masoudi, MD, MSPH, FACC, FAHA, FACP
H. Vernon Anderson,MD, FACC, FSCAI
David Malenka, MD, FACC
Matt Roe, MD, FACC
Steve Hammill, MD, FHRS, FACC
Jeptha Curtis, MD, FACC
Paul Heidenreich, MD, MS, FACC
Brahmajee Nallamothu, MD, MPH, FACC
Mark Kremers, MD, FACC
Christopher White MD, FACC
Carl Tommaso, MD, FACC, FAHA, FSCAI
Sunil Rao, MD, FACC, FSCAI
Andrea Russo, MD, FACC, FHRS
Debabrata Mukherjee MD, FACC

Ad.2 **If adapted, provide name of original measure:**
Ad.3-5 **If adapted, provide original specifications URL or attachment**

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.6 **Year the measure was first released:** 2007
Ad.7 **Month and Year of most recent revision:** 12, 2010
Ad.8 **What is your frequency for review/update of this measure?** Every 3-4 years or if guideline updates warrant more frequent update, or with new dataset version.
Ad.9 **When is the next scheduled review/update for this measure?** 12, 2011

Ad.10 **Copyright statement:**

Ad.11 **Disclaimers:**

Ad.12 -14 Additional Information web page URL or attachment: Attachment CAREmeasureTesting.docx
Date of Submission (*MM/DD/YY*)**:** 12/14/2010

CARE A/F Status

The FREQ Procedure

DQR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Pass	15483	87.15	15483	87.15
Fail	2283	12.85	17766	100.00

Counts of Endpoints with A Status

The FREQ Procedure

21-60 day Certified NIHSS Administered				
nihss	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
(0) No	12195	78.76	12195	78.76
(1) Yes	3288	21.24	15483	100.00

>60 day Certified NIHSS Administered				
nihss_late	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
(0) No	15366	99.24	15366	99.24
(1) Yes	117	0.76	15483	100.00

<21 day Certified NIHSS Administered				
nihss_early	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
(0) No	15140	97.78	15140	97.78
(1) Yes	343	2.22	15483	100.00

Death	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
(0) No	15352	99.15	15352	99.15
(1) Yes	131	0.85	15483	100.00

21-60 day Certified NIHSS or Vital Status[1]				
combined_endpoint	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
(0) No	12064	77.92	12064	77.92
(1) Yes	3419	22.08	15483	100.00

[1] death prior to discharge or follow-up patient status documented, “alive” or “deceased”

2x2 tables with procedure type

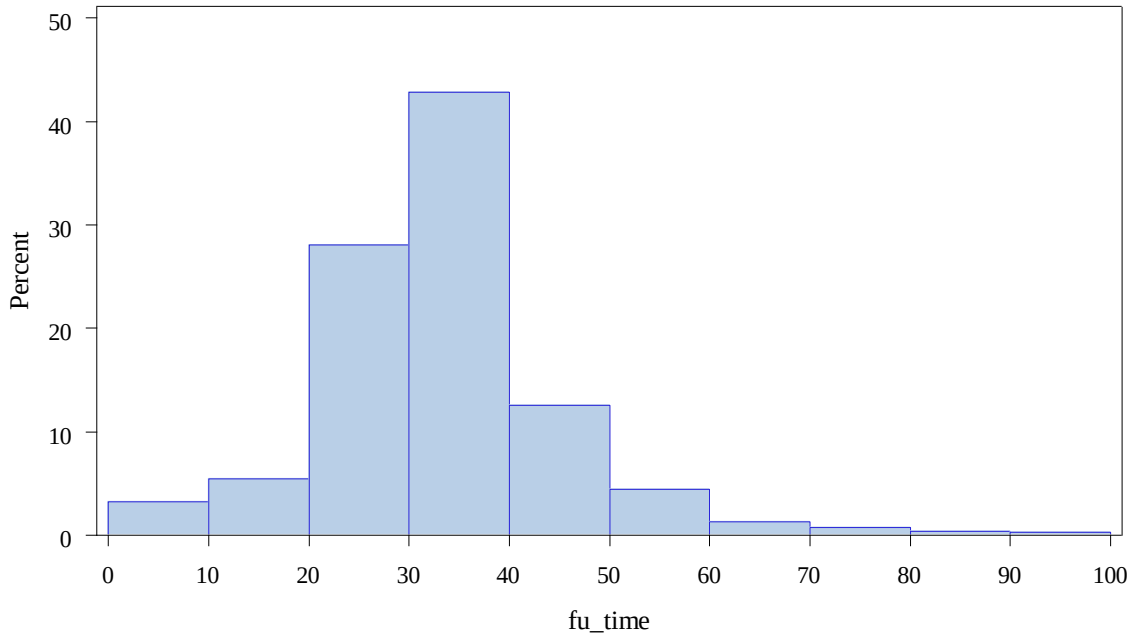
The FREQ Procedure

Table of ProcType by combined_endpoint			
Procedure Type	**Combined Endpoint(21-60 day Certified NIHSS or Vital Status)**		
Frequency Row Pct	**(0) No**	**(1) Yes**	**Total**
(1)CAS	5400 61.97	3314 38.03	8714
(2)CEA	6664 98.45	105 1.55	6769
Total	12064	3419	15483

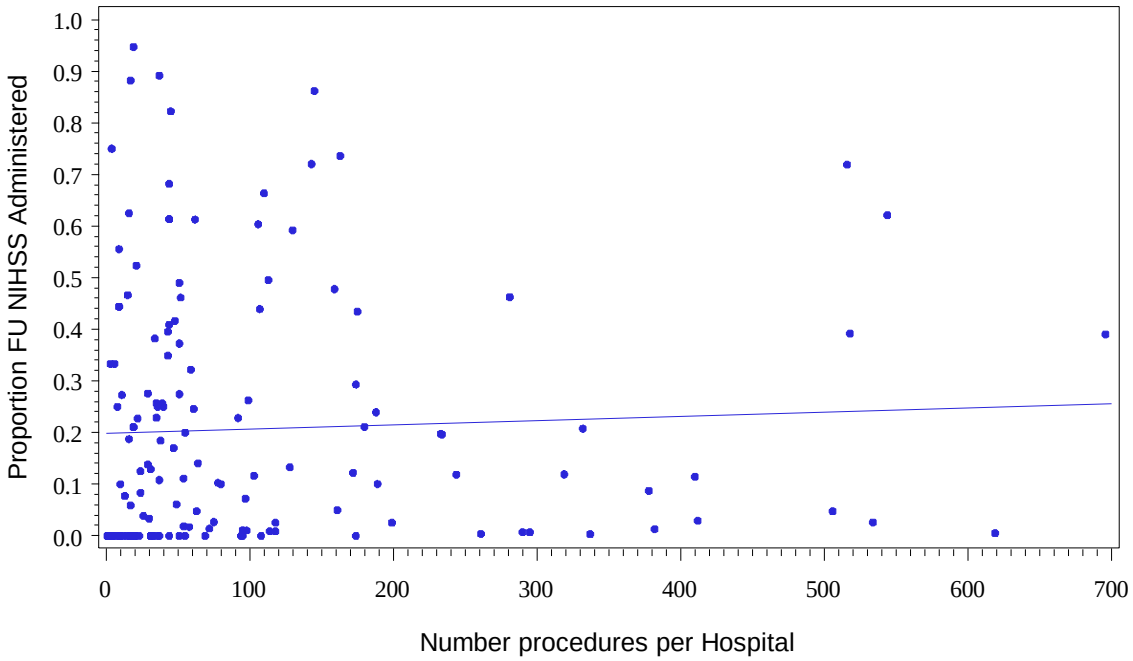
Table of Procedure Type by nihss scale			
Procedure Type	**fu_nihss(21-60 day Certified NIHSS Administered)**		
Frequency Row Pct	**(0) No**	**(1) Yes**	**Total**
(1)CAS	5490 63.00	3224 37.00	8714
(2)CEA	6705 99.05	64 0.95	6769
Total	12195	3288	15483

Table of Procedure Type by Vital Status			
Procedure Type	**Death**		
Frequency Row Pct	**(0) No**	**(1) Yes**	**Total**
(1)CAS	8624 98.97	90 1.03	8714
(2)CEA	6728 99.39	41 0.61	6769
Total	15352	131	15483

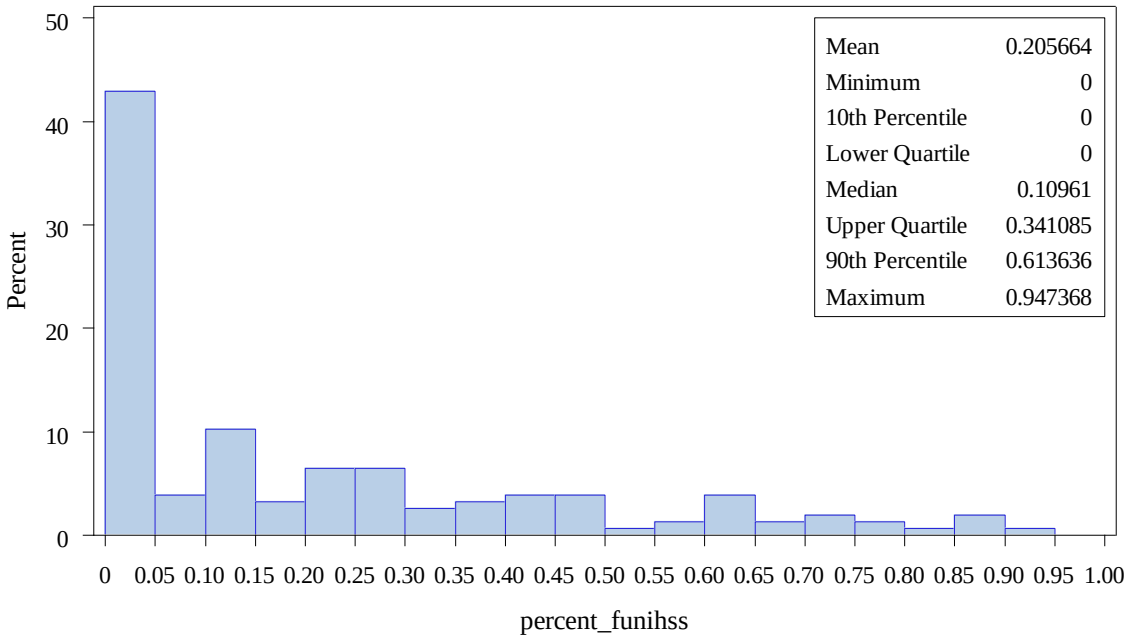
Days post-procedure for Assessment



Hospital Level: Proportion NIHSS by # procedures



Hospital Distribution of Combined Endpoint



Tertiles of Percent NIHSS Administered at Hospital Level

CARE					
	Total	percent_funihss			
	n = 156	Tertile 1 (0 to <0.0102040816) n = 51	Tertile 2 (0.0102040816 to <0.25) n = 53	Tertile 3 (0.25 to 0.947368) n = 52	P-Value
Number Procedures	99.3 ± 135.9	63.1 ± 113.4	132.2 ± 136.0	101.2 ± 149.2	0.034
percent_caucasian	91.9 ± 11.4	93.0 ± 11.0	90.9 ± 12.8	91.8 ± 10.2	0.663
percent_female	38.8 ± 15.2	40.7 ± 21.7	41.6 ± 8.6	34.1 ± 11.4	0.022
percent_noinsurance	4.3 ± 9.2	4.3 ± 9.5	4.6 ± 10.5	4.0 ± 7.5	0.948
Continuous variables compared using one-way analysis of variance. Categorical variables compared using chi-square or Fisher's exact test.					