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 #:** 0357 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** Abdominal Aortic Aneurysm (AAA) Repair Volume (IQI 4)
De.2 **Brief description of measure:** Count of discharges with a procedure code of provider-level AAA repair.
1.1-2 **Type of Measure:** Structure/management De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Abdominal Aortic Aneurysm (AAA) Repair Mortality (IQI 11) (NQF #0359) and Mortality for Selected Procedures composite
De.4 **National Priority Partners Priority Area:** Population health, Safety De.5 **IOM Quality Domain**: Effectiveness, Safety De.6 **Consumer Care Need:** Getting better

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:** Government entity and in the public domain - no agreement necessary A.4 **Measure Steward Agreement attached:**	**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	**B** Y☐

every 3 years. Yes, information provided in contact section	N☐
C. The intended use of the measure includes both public reporting and quality improvement. ►**Purpose:** Public reporting, Internal quality improvement	**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:** Patient/societal consequences of poor quality 1a.2 1a.3 **Summary of Evidence of High Impact:** Most studies published since 1985 showed a significant association between either hospital or surgeon volume and inpatient mortality after AAA repair, although these findings may be limited by inadequate risk adjustment of the outcome measure and differ by type of aneurysms (intact vs. ruptured) being considered. Several studies have explored whether experience on related, but not identical, cases may lead to improved outcomes. One study found that hospital volume of surgery for ruptured aneurysms was not associated with postoperative inpatient mortality, but it was associated with fewer inpatient deaths for ruptured aneurysms, suggesting that high-volume hospitals may manage ruptured aneurysms more aggressively. [1] One study that evaluated the impact of total vascular surgery volume found a significant effect for both ruptured and intact aneurysms. [2] Empirical evidence shows that AAA repair volume and mortality—after adjusting for age, sex, and APR-DRG—are independently and negatively correlated with each other (r=-.35, p<.001). [3] 1a.4 **Citations for Evidence of High Impact:** Updated citations will be presented in the May Steering Committee meeting [1] Kantonen I, Lepantalo M, Brommels M, et al. Mortality in ruptured abdominal aortic aneurysms. The Finnvasc Study Group. . Eur J Vasc Endovasc Surg 1999;17(3):208-12. [2] Amundsen S, Skjaerven R, Trippestad A, et al. Abdominal aortic aneurysms. Is there an association between surgical volume, surgical experience, hospital type and operative mortality? Members of the	**1a** C☐ P☐ M☐ N☐

Norwegian Abdominal Aortic Aneurysm Trial. Acta Chir Scand 1990;156(4):323-7; discussion 327-8.
[3] Nationwide Inpatient Sample.

1b. Opportunity for Improvement

1b.1 Benefits (improvements in quality) envisioned by use of this measure: Abdominal Aortic Aneurysm (AAA) repair is a relatively rare procedure that requires proficiency with the use of complex equipment; and technical errors may lead to clinically significant complications, such as arrhythmias, acute myocardial infarction, colonic ischemia, and death. Higher volumes have been associated with better outcomes, which represent better quality.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
Comparative Data for the IQI based on the 2008 Nationwide Inpatient Sample (NIS):

	SEX
7,795	Males
1,996	Females
	AGE
12	18 to 39
1,574	40 to 64
3,618	65 to 74
4,587	75+
	PAYER
7,377	Medicare
155	Medicaid
2,243	Other

Based on the above, we see AAAs are occurring nearly four times more frequently in males compared to females. We also observe the procedure occurs primarily with the Medicare population; age 65 years and older.

Information about NIS can be found at this AHRQ link: http://www.hcup-us.ahrq.gov/nisoverview.jsp#Whatis

1b.3 Citations for data on performance gap:
See the following report for a complete treatment of the methodology: "Methods: Applying AHRQ Quality Indicators to Healthcare Cost and Utilization Project (HCUP) Data for the National Healthcare Quality Report" [URL: http://hcupnet.ahrq.gov/QI%20Methods.pdf?JS=Y]

1b.4 Summary of Data on disparities by population group:
Comparative Data for the IQI based on the 2008 Nationwide Inpatient Sample (NIS):

	SEX
7,795	Males
1,996	Females
	AGE
12	18 to 39
1,574	40 to 64
3,618	65 to 74
4,587	75+
	PAYER
7,377	Medicare
155	Medicaid
2,243	Other

1b
C ☐
P ☐
M ☐
N ☐

Information about NIS can be found at this AHRQ link: http://www.hcup-us.ahrq.gov/nisoverview.jsp#Whatis

RACE
29,703 White
1,350 Black
949 Hispanic
457 Asian and NH/PI
240 Amer Indian/AN
7,537 Other

Source: 2008 State Inpatient Databases (SID). http://hcup-us.ahrq.gov/sidoverview.jsp

1b.5 Citations for data on Disparities:
See the following report for a complete treatment of the methodology: "Methods: Applying AHRQ Quality Indicators to Healthcare Cost and Utilization Project (HCUP) Data for the National Healthcare Quality Report" [URL: http://hcupnet.ahrq.gov/QI%20Methods.pdf?JS=Y]

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*)**:** Abdominal Aortic Aneurysm (AAA) repair is a relatively rare procedure that requires proficiency with the use of complex equipment; and technical errors may lead to clinically significant complications, such as arrhythmias, acute myocardial infarction, colonic ischemia, and death. Higher volumes have been associated with better outcomes, which represent better quality.

1c.2-3. Type of Evidence: Evidence-based guideline, Expert opinion

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
Most studies published since 1985 showed a significant association between either hospital or surgeon volume and inpatient mortality after AAA repair, although these findings may be limited by inadequate risk adjustment of the outcome measure and differ by type of aneurysms (intact vs. ruptured) being considered. Several studies have explored whether experience on related, but not identical, cases may lead to improved outcomes. One study found that hospital volume of surgery for ruptured aneurysms was not associated with postoperative inpatient mortality, but it was associated with fewer inpatient deaths for ruptured aneurysms, suggesting that high-volume hospitals may manage ruptured aneurysms more aggressively. [1] One study that evaluated the impact of total vascular surgery volume found a significant effect for both ruptured and intact aneurysms. [2] Empirical evidence shows that AAA repair volume and mortality—after adjusting for age, sex, and APR-DRG—are independently and negatively correlated with each other ($r=-.35$, $p<.001$). [3]

[1] Kantonen I, Lepantalo M, Brommels M, et al. Mortality in ruptured abdominal aortic aneurysms. The Finnvasc Study Group. . Eur J Vasc Endovasc Surg 1999;17(3):208-12.
[2] Amundsen S, Skjaerven R, Trippestad A, et al. Abdominal aortic aneurysms. Is there an association between surgical volume, surgical experience, hospital type and operative mortality? Members of the Norwegian Abdominal Aortic Aneurysm Trial. Acta Chir Scand 1990;156(4):323-7; discussion 327-8.
[3] Nationwide Inpatient Sample.

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):**
B. Testing, rating, and review were conducted by the project team. A full report on the literature review and empirical evaluation can be found in Refinement of the HCUP Quality Indicators by the UCSF-Stanford EPC, Detailed coding information for each QI is provided in the document Prevention Quality Indicators Technical Specifications. Rating of performance on empirical evaluations, ranged from 0 to 26. The scores were intended as a guide for summarizing the performance of each indicator on four empirical tests of precision (signal variance, area-level share, signal ratio, and R-squared) and five tests of minimum bias (rank correlation, top and bottom decile movement, absolute change, and change over two deciles), as described in the previous section.

1c.6 Method for rating evidence: The project team conducted extensive empirical testing of all potential

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P☐
M☐
N☐

indicators using the 1995-97 HCUP State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. The 1997 SID contains uniform data on inpatient stays in community hospitals for 22 States covering approximately 60% of all U.S. hospital discharges. The NIS is designed to approximate a 20% of U.S. community hospitals and includes all stays in the sampled hospitals. Each year of the NIS contains between 6 million and 7 million records from about 1,000 hospitals. The NIS combines a subset of the SID data, hospital-level variables, and hospital and discharge weights for producing national estimates. The project team conducted tests to examine three things: precision, bias, and construct validity.

Precision. The first step in the analysis involved precision tests to determine the reliability of the indicator for distinguishing real differences in provider performance. For indicators that may be used for quality improvement, it is important to know with what precision, or surety, a measure can be attributed to an actual construct rather than random variation.

For each indicator, the variance can be broken down into three components: variation within a provider (actual differences in performance due to differing patient characteristics), variation among providers (actual differences in performance among providers), and random variation. An ideal indicator would have a substantial amount of the variance explained by between-provider variance, possibly resulting from differences in quality of care, and a minimum amount of random variation. The project team performed four tests of precision to estimate the magnitude of between-provider variance on each indicator:

• Signal standard deviation was used to measure the extent to which performance of the QI varies systematically across hospitals or areas.

• Provider/area variation share was used to calculate the percentage of signal (or true) variance relative to the total variance of the QI.

• Signal-to-noise ratio was used to measure the percentage of the apparent variation in QIs across providers that is truly related to systematic differences across providers and not random variations (noise) from year to year.

• In-sample R-squared was used to identify the incremental benefit of applying multivariate signal extraction methods for identifying additional signal on top of the signal-to-noise ratio.

In general, random variation is most problematic when there are relatively few observations per provider, when adverse outcome rates are relatively low, and when providers have little control over patient outcomes or variation in important processes of care is minimal. If a large number of patient factors that are difficult to observe influence whether or not a patient has an adverse outcome, it may be difficult to separate the "quality signal" from the surrounding noise. Two signal extraction techniques were applied to improve the precision of an indicator:

• Univariate methods were used to estimate the "true" quality signal of an indicator based on information from the specific indicator and 1 year of data.

• Multivariate signal extraction (MSX) methods were used to estimate the "true" quality signal based on information from a set of indicators and multiple years of data. In most cases, MSX methods extracted additional signal, which provided much more precise estimates of true hospital or area quality.

Bias. To determine the sensitivity of potential QIs to bias from differences in patient severity, unadjusted performance measures for specific hospitals were compared with performance measures that had been adjusted for age and gender. All of the PQIs and some of the Inpatient Quality Indicators (IQIs) could only be risk-adjusted for age and sex. The 3M™ APR-DRG System Version 12 with Severity of Illness and Risk of Mortality subclasses was used for risk adjustment of the utilization indicators and the in-hospital mortality indicators, respectively. Five empirical tests were performed to investigate the degree of bias in an indicator:

• Rank correlation coefficient of the area or hospital with (and without) risk adjustment—gives the overall impact of risk adjustment on relative provider or area performance.

• Average absolute value of change relative to mean—highlights the amount of absolute change in performance, without reference to other providers' performance.

• Percentage of highly ranked hospitals that remain in high decile—reports the percentage of hospitals or areas that are in the highest deciles without risk adjustment that remain there after risk adjustment is performed.

• Percentage of lowly ranked hospitals that remain in low decile—reports the percentage of hospitals or areas that are in the lowest deciles without risk adjustment that remain there after risk adjustment is performed.

• Percentage that change more than two deciles—identifies the percentage of hospitals whose relative rank changes by a substantial percentage (more than 20%) with and without risk adjustment.

Construct validity. Construct validity analyses provided information regarding the relatedness or independence of the indicators. If quality indicators do indeed measure quality, then two measures of the same construct would be expected to yield similar results. The team used factor analysis to reveal underlying

patterns among large numbers of variables—in this case, to measure the degree of relatedness between indicators. In addition, they analyzed correlation matrices for indicators.

1c.7 **Summary of Controversy/Contradictory Evidence:** Some users have questioned the inclusion of both ruptured and unruptured AAA and open and endovascular procedures. However, the experience of repair procedures (open or endovascular) carriers over to both types of classes of patients, and total volume was a better predictor of overall mortality than the individual volumes.

1c.8 **Citations for Evidence (***other than guidelines***):** Updated citations will be presented in the May Steering Committee meeting

Hannan EL, Kilburn H, Jr., O'Donnell JF, et al. A longitudinal analysis of the relationship between in-hospital mortality in New York state and the volume of abdominal aortic aneurysm surgeries performed. Health Serv Res 1992;27(4):517-42.
Kazmers A, Jacobs L, Perkins A, et al. Abdominal aortic aneurysm repair in Veterans Affairs medical centers. J Vasc Surg 1996;23(2):191-200.
Pronovost PJ, Jenckes MW, Dorman T, et al. Organizational characteristics of intensive care units related to outcomes of abdominal aortic surgery. JAMA 1999;281(14):1310-7.

1c.9 **Quote the Specific guideline recommendation (***including guideline number and/or page number***):**
EVAR for AAA represents an advance in patient care, serving as an effective alternative to traditional open surgical AAA repair, and is now the most common treatment method for AAA repair in the United States.

1c.10 **Clinical Practice Guideline Citation:** http://www.sirweb.org/clinical/cpg/QI12.pdf
1c.11 **National Guideline Clearinghouse or other URL:** Not Applicable.

1c.12 **Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):**
Not Applicable.

1c.13 **Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF)*:
Not Applicable.

1c.14 **Rationale for using this guideline over others:**
Not Applicable.

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? — **1** **Y☐** **N☐**
Rationale:

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-specs** **C☐** **P☐** **M☐** **N☐**

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***):**
Discharges, age 18 years and older, with an abdominal aortic aneurysm repair procedure and a primary or secondary diagnosis of AAA.

2a.2 Numerator Time Window (*The time period in which cases are eligible for inclusion in the numerator*):
Time window can be determined by user, but is generally a calendar year.

2a.3 Numerator Details (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*):
Discharges, age 18 years and older, with an abdominal aortic aneurysm repair procedure and a primary or secondary diagnosis of AAA in any field.

ICD-9-CM AAA procedure codes:
3834
AORTA RESECTION & ANAST
3844
RESECT ABDM AORTA W REPL
3864
EXCISION OF AORTA
3971
ENDO IMPLANT OF GRAFT IN AORTA

ICD-9-CM AAA diagnosis codes:
4413
RUPT ABD AORTIC ANEURYSM
4414
ABDOM AORTIC ANEURYSM

Exclude cases:
• MDC 14 (pregnancy, childbirth, and puerperium)

2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured*):
This volume measure does not have a denominator.

2a.5 Target population gender: Female, Male
2a.6 Target population age range: 18 and older

2a.7 Denominator Time Window (*The time period in which cases are eligible for inclusion in the denominator*):
Not applicable

2a.8 Denominator Details (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions*):
Not applicable

2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population*): Numerator exclusions
• MDC 14 (pregnancy, childbirth, and puerperium)

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions*):
This volume measure does not have a denominator.

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions*):
Not applicable

2a.12-13 Risk Adjustment Type: No risk adjustment necessary

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method*):
None.

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

2a.18-19 Type of Score: Count
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***):**
The volume is the number of discharges with a diagnosis of, and a procedure for AAA.

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
Performance discrimination is based on pre-defined thresholds derived from the literature. Threshold 1: 10 or more procedures per year Threshold 2: 32 or more procedures per year.

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)*:
Not applicable

2a.24 Data Source (*Check the source(s) for which the measure is specified and tested)*
Electronic administrative data/claims

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.***):**
The data source is hospital discharge data such as the HCUP State Inpatient Databases (SID) or equivalent using UB-04 coding standards. The data collection instrument is public-use AHRQ QI software available in SAS or Windows versions.

2a.26-28 Data source/data collection instrument reference web page URL or attachment: URL None
http://www.qualityindicators.ahrq.gov/software.htm

2a.29-31 Data dictionary/code table web page URL or attachment: URL None
http://www.qualityindicators.ahrq.gov/downloads/winqi/AHRQ_QI_Windows_Software_Documentation_V41a.pdf

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

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Hospital

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

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)***:** AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges

2b.2 Analytic Method *(type of reliability & rationale, method for testing)***:**
Literature summary, expert panels and empirical analysis

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
AAA repair is an uncommon cardiovascular procedure—only 50,000 were performed in the United States in 2007. Although AAA repair is measured accurately with discharge data, the relatively small number of procedures performed annually at most hospitals suggests that volume may be subject to much random variation.

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 Data/sample *(description of data/sample and size)***:** AHRQ 2007 State Inpatient Databases (SID) with

2c C☐ P☐

4,000 hospitals and 30 million adult discharges **2c.2 Analytic Method** *(type of validity & rationale, method for testing)*: Literature summary, expert panels and empirical analysis **2c.3 Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*: Most studies published since 1985 showed a significant association between either hospital or surgeon volume and inpatient mortality after AAA repair, although these findings may be limited by inadequate risk adjustment of the outcome measure and differ by type of aneurysms (intact vs. ruptured) being considered. Several studies have explored whether experience on related, but not identical, cases may lead to improved outcomes. One study found that hospital volume of surgery for ruptured aneurysms was not associated with postoperative inpatient mortality, but it was associated with fewer inpatient deaths for ruptured aneurysms, suggesting that high-volume hospitals may manage ruptured aneurysms more aggressively.[3] One study that evaluated the impact of total vascular surgery volume found a significant effect for both ruptured and intact aneurysms.[2] Empirical evidence shows that AAA repair volume and mortality—after adjusting for age, sex, and APR-DRG—are independently and negatively correlated with each other (r=-.35, p<.001).[3] References: [1] Kantonen I, Lepantalo M, Brommels M, et al. Mortality in ruptured abdominal aortic aneurysms. The Finnvasc Study Group. . Eur J Vasc Endovasc Surg 1999;17(3):208-12. [2] Amundsen S, Skjaerven R, Trippestad A, et al. Abdominal aortic aneurysms. Is there an association between surgical volume, surgical experience, hospital type and operative mortality? Members of the Norwegian Abdominal Aortic Aneurysm Trial. Acta Chir Scand 1990;156(4):323-7; discussion 327-8. [3] Nationwide Inpatient Sample.	M☐ N☐
2d. Exclusions Justified **2d.1 Summary of Evidence supporting exclusion(s):** Not applicable **2d.2 Citations for Evidence:** Not applicable **2d.3 Data/sample** *(description of data/sample and size)*: Not applicable **2d.4 Analytic Method** *(type analysis & rationale)*: Not applicable **2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*: Not applicable	**2d** C☐ P☐ M☐ N☐ NA ☐
2e. Risk Adjustment for Outcomes/ Resource Use Measures **2e.1 Data/sample** *(description of data/sample and size)*: Not applicable **2e.2 Analytic Method** *(type of risk adjustment, analysis, & rationale)*: Not applicable **2e.3 Testing Results** *(risk model performance metrics)*: Not applicable **2e.4 If outcome or resource use measure is not risk adjusted, provide rationale:** Volume	**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)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges **2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance**	**2f** C☐ P☐ M☐ N☐

(type of analysis & rationale): Predefined thresholds based on the literature 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)*: Q1 Q2 Q3 Q4 1.9 5.6 13.8 47.3 N = 1,963	
2g. Comparability of Multiple Data Sources/Methods 2g.1 **Data/sample** *(description of data/sample and size)*: Not applicable 2g.2 **Analytic Method** *(type of analysis & rationale)*: Not applicable 2g.3 **Testing Results** *(e.g., correlation statistics, comparison of rankings)*: Not applicable	**2g** C☐ P☐ M☐ N☐ NA ☐
2h. Disparities in Care 2h.1 **If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: Not applicable 2h.2 **If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:** Not applicable	**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)*: California (state) Hospital Volume and Utilization Indicators for California http://www.oshpd.ca.gov/HID/Products/PatDischargeData/ResearchReports/HospIPQualInd/Vol-Util_IndicatorsRpt/index.html Colorado (state hospital association) Colorado Hospital Report Card	**3a** C☐ P☐ M☐ N☐

http://www.cohospitalquality.org/index.php?option=com_frontpage&Itemid=1

Illinois (state hospital association)
Illinois Hospitals Caring for You
www.illinoishospitals.org

Kentucky (Norton Healthcare, a hospital system)
Norton Healthcare Quality Report
http://www.nortonhealthcare.com/body.cfm?id=157

New Jersey (state)
Find and Compare Quality Care in NJ Hospitals
http://www.nj.gov/health/healthcarequality/

New York (health care coalition)
New York State Hospital Report Card
http://www.myhealthfinder.com/

Oregon (state)
Oregon Hospital Quality Indicators
http://www.oregon.gov/OHPPR/HQ/

Texas (state)
Reports on Hospital Performance
http://www.dshs.state.tx.us/thcic/

Vermont (state)
Dept of Banking, Insurance, Securities & Health Care Administration Comparison Report
http://www.bishca.state.vt.us/health-care/hospitals-health-care-practitioners/2009-vermont-hospital-report-card

Washington (health care coalition)
Washington State Hospital Report Card
http://www.myhealthfinder.com/wa09/index.php

The measure is also reported on HCUPnet:
http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=EB57801381F71C41&Form=MAINSEL&JS=Y&Action=%3E%3ENext%3E%3E&_MAINSEL=AHRQ%20Quality%20Indicators

This measure is used in the MONAHRQ system that is provided for public reporting and quality improvement throughout the United States: http://monahrq.ahrq.gov/

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***):**
University Healthcare Consortium - An alliance of 103 academic medical centers and 219 of their affiliated hospitals. Reporting the AHRQ QIs to their member hospitals. (see www.uhc.edu. Note: measure results reported to hospitals; not reported on site).

Dallas Fort Worth Hospital Council – Reporting on measure results to over 70 hospitals in Texas (see www.dfwhc.ord. Note: measure results reported to hospitals; not reported on site).

Norton Healthcare - a multi-hospital system in Kentucky (see http://www.nortonhealthcare.com/about/Our_Performance/index.aspx)
Ministry Health Care - a multi-hospital system in Wisconsin (see http://ministryhealth.org/display/router.aspx. Note: measure results reported to hospitals; not reported on site).

Minnesota Hospital Association
http://www.mnhospitals.org/ Note: measure used in quality improvement. Not reported publicly by the association).

This measure is used in the MONAHRQ system that is provided for public reporting and quality improvement throughout the United States: http://monahrq.ahrq.gov/

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)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges

3a.5 **Methods** *(e.g., focus group, survey, QI project)*:
A research team from the School of Public Affairs, Baruch College, under contracts with the Department of Public Health, Weill Medical College and Battelle, Inc., has developed a pair of Hospital Quality Model Reports at the request of the Agency for Healthcare Research & Quality (AHRQ). These reports are designed specifically to report comparative information on hospital performance based on the AHRQ Quality Indicators (QIs). The work was done in close collaboration with AHRQ staff and the AHRQ Quality Indicators team.
The Model Reports (discussed immediately above) are based on:
• Extensive search and analysis of the literature on hospital quality measurement and reporting, as well as public reporting on health care quality more broadly;
• Interviews with quality measurement and reporting experts, purchasers, staff of purchasing coalitions, and executives of integrated health care delivery systems who are responsible for quality in their facilities;
• Two focus groups with chief medical officers of hospitals and/or systems and two focus groups with quality managers from a broad mix of hospitals;
• Four focus groups with members of the public who had recently experienced a hospital admission; and
• Four rounds of cognitive interviews (a total of 62 interviews) to test draft versions of the two Model Reports with members of the public with recent hospital experience, basic computer literacy but widely varying levels of education

3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:
Given the above review of the literature and original research that was conducted, a Model report was the result that could help sponsors use the best evidence on public reports so they are most likely to have the desired effects on quality

3b/3c. Relation to other NQF-endorsed measures

3b.1 **NQF # and Title of similar or related measures:**
Leapfrog survival predicator

(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?**
Leapfrog measure specification is based on the AHRQ QI, but is not reported separately

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:**
The AHRQ QI measure is paried with a risk-adjusted mortality measure

5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:**
The AHRQ QI measure is paried with a risk-adjusted mortality measure

3c
C☐
P☐
M☐
N☐
NA☐

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?** 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.** Coding professionals follow detail guidelines, are subject to training and credentialing requirements, peer review and audit. AAA repair volume is measured with great precision, although volume indicators overall are not direct measures of quality and are relatively insensitive. For this reason, this indicator should be used in conjunction with other measures of mortality to ensure that increasing volumes truly improve patient outcomes. The volume-outcome relationship on which this indicator is based may not hold over time, as providers become more experienced or as technology changes.	**4d** **C☐** **P☐** **M☐** **N☐**
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:** Low-volume providers may attempt to increase their volume without improving quality of care by performing the procedure on patients who may not qualify or benefit. Additionally, shifting procedures to high-volume providers may impair access to care for certain types of patients. **4e.2 Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** All data necessary to calculate this measure are routinely collected for hospital administrative purposes. The software for calculating the measure is available for free at: http://www.qualityindicators.ahrq.gov/software.htm	**4e** **C☐** **P☐** **M☐** **N☐**

4e.3 Evidence for costs: All data necessary to calculate this measure are routinely collected for hospital administrative purposes. The software for calculating the measure is available for free at: http://www.qualityindicators.ahrq.gov/software.htm **4e.4 Business case documentation:** All data necessary to calculate this measure are routinely collected for hospital administrative purposes. The software for calculating the measure is available for free at: http://www.qualityindicators.ahrq.gov/software.htm	
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** Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850 **Co.2 Point of Contact** John, Bott, MSSW, MBA, John.Bott@AHRQ.hhs.gov, 301-427-1317-	
Measure Developer If different from Measure Steward **Co.3 Organization** Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850 **Co.4 Point of Contact** John, Bott, MSSW, MBA, John.Bott@AHRQ.hhs.gov, 301-427-1317-	
Co.5 Submitter If different from Measure Steward POC John, Bott, MSSW, MBA, John.Bott@AHRQ.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality	
Co.6 Additional organizations that sponsored/participated in measure development UC Davis, Stanford University, Battelle Memorial Institute	
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.** None	
Ad.2 If adapted, provide name of original measure: None **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: 2001 **Ad.7 Month and Year of most recent revision:** 10, 2010 **Ad.8 What is your frequency for review/update of this measure?** Annual **Ad.9 When is the next scheduled review/update for this measure?** 05, 2011
Ad.10 Copyright statement/disclaimers: The AHRQ QI software is publicly available; no copyright disclaimers
Ad.11 -13 Additional Information web page URL or attachment:
Date of Submission (*MM/DD/YY*)**:** 04/05/2011

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 #:** 0359 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** Abdominal Aortic Artery (AAA) Repair Mortality Rate (IQI 11)
De.2 **Brief description of measure:** Percent of discharges with procedure code of AAA repair with an in-hospital death.
1.1-2 **Type of Measure:** Outcome De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Abdominal Aortic Artery (AAA) Repair Volume (IQI 4) (NQF #0357)
De.4 **National Priority Partners Priority Area:** Population health, Safety De.5 **IOM Quality Domain**: Effectiveness, Safety De.6 **Consumer Care Need:** Getting better

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:** Government entity and in the public domain - no agreement necessary A.4 **Measure Steward Agreement attached:**	**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	**B** Y☐

every 3 years. Yes, information provided in contact section	N☐
C. The intended use of the measure includes both public reporting and quality improvement. ►**Purpose:** Public reporting, Internal quality improvement	**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:** Patient/societal consequences of poor quality 1a.2 1a.3 **Summary of Evidence of High Impact:** The correlation between hospital or physician characteristics and in-hospital mortality in most studies supports the validity of in-hospital mortality as a measure of quality. [1] [2] Finally, excessive blood loss, which is a potentially preventable complication of surgery, has been identified as the most important predictor of mortality after elective AAA repair. [3] Empirical evidence shows that AAA repair mortality is positively related to other post-procedural mortality measures, such as craniotomy (r=.28, p<.0001) and coronary artery bypass graft (CABG) (r=.17, p<.01). [4] 1a.4 **Citations for Evidence of High Impact:** Updated citations will be presented in the May Steering Committee meeting [1] Pearce WH, Parker MA, Feinglass J, et al. The importance of surgeon volume and training in outcomes for vascular surgical procedures. J Vasc Surg 1999;29(5):768-76. [2] Rutledge R, Oller DW, Meyer AA, et al. A statewide, population-based time-series analysis of the outcome of ruptured abdominal aortic aneurysm. Ann Surg 1996;223(5):492-502. [3] Pilcher DB, Davis JH, Ashikaga T, et al. Treatment of abdominal aortic aneurysm in an entire state over 7½ years. Am J Surg 1980;139(4):487-94. [4] Nationwide Inpatient Sample.	**1a** C☐ P☐ M☐ N☐
1b. Opportunity for Improvement	**1b**

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M☐
N☐

1b.1 Benefits (improvements in quality) envisioned by use of this measure: Abdominal aortic aneurysm (AAA) repair is a relatively rare procedure that requires proficiency with the use of complex equipment; and technical errors may lead to clinically significant complications, such as arrhythmias, acute myocardial infarction, colonic ischemia, and death. Better processes of care may reduce mortality for AAA repair, which represents better quality care.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
Adjusted per 1,000 rates by patient/hospital characteristics, 2007

Estimate	Standard error	Age: for conditions affecting any age
*	*	18-44
23.652	1.960	45-64
66.393	1.451	65 and over

Estimate	Standard error	Age: for conditions affecting elderly
43.864	2.381	65-69
50.251	2.498	70-74
79.688	3.095	75-79
72.624	3.695	80-84
107.763	6.188	85 and over

Estimate	Standard error	Gender
51.876	1.339	Male
90.433	3.249	Female

Estimate	Standard error	Median income of patient´s ZIP code
59.088	2.445	First quartile (lowest income)
54.793	2.336	Second quartile
58.174	2.397	Third quartile
54.942	2.561	Fourth quartile (highest income)

Estimate	Standard error	Location of patient residence (NCHS)
48.893	2.572	Large central metropolitan
57.852	2.538	Large fringe metropolitan
57.678	2.492	Medium metropolitan
64.648	3.682	Small metropolitan
56.657	3.484	Micropolitan
62.375	4.327	Not metropolitan or micropolitan

Estimate	Standard error	Expected payment source
45.140	3.185	Private insurance
57.658	1.353	Medicare
85.285	9.645	Medicaid
76.100	9.933	Other insurance
73.418	9.344	Uninsured / self-pay / no charge

Estimate	Standard error	Hospital Ownership/control

56.433	1.380	Private, not-for-profit
56.869	3.651	Private, for-profit
58.869	3.602	Public

Estimate	Standard error	Teaching status
52.177	1.899	Teaching
59.950	1.582	Nonteaching

Estimate	Standard error	Location of hospital
49.673	2.096	Large central metropolitan
59.498	2.865	Large fringe metropolitan
57.560	2.322	Medium metropolitan
68.001	3.190	Small metropolitan
60.056	4.952	Micropolitan
*	*	Not metropolitan or micropolitan

Estimate	Standard error	Bed size of hospital
55.838	6.706	Less than 100
66.185	2.122	100 - 299
54.707	1.998	300 - 499
48.492	2.343	500 or more

1b.3 Citations for data on performance gap:
See the following report for a complete treatment of the methodology: "Methods: Applying AHRQ Quality Indicators to Healthcare Cost and Utilization Project (HCUP) Data for the National Healthcare Quality Report" [URL: http://hcupnet.ahrq.gov/QI%20Methods.pdf?JS=Y]

1b.4 Summary of Data on disparities by population group:
Information on results by geographic areas noted below. Also 1b2 provides results by age, gender, income, micropolitian and metropolitian and payer.

Adjusted per 1,000 rates by patient and hospital characteristics, 2007

Mean	Standard error	Location	P-value: Relative to Northeast
61.859	2.711	Northeast	1.000
49.824	2.554	Midwest	0.001
53.232	2.053	South	0.011
65.177	2.577	West	0.375

RACE / ETHNICITY
Rate per 100

White	4.52
Black	5.48
Hispanic	5.40
Asian and NH/PI	5.33
Amer Indian/AN	4.58
Other	4.66

Source: 2008 State Inpatient Databases (SID) (N=39,963)

1b.5 Citations for data on Disparities:

See the following report for a complete treatment of the methodology: "Methods: Applying AHRQ Quality Indicators to Healthcare Cost and Utilization Project (HCUP) Data for the National Healthcare Quality Report" [URL: http://hcupnet.ahrq.gov/QI%20Methods.pdf?JS=Y]

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*)**:** Abdominal aortic aneurysm (AAA) repair is a relatively rare procedure that requires proficiency with the use of complex equipment; and technical errors may lead to clinically significant complications, such as arrhythmias, acute myocardial infarction, colonic ischemia, and death. Better processes of care may reduce mortality for AAA repair, which represents better quality care.

1c.2-3. Type of Evidence: Expert opinion, Systematic synthesis of research

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
Most studies published since 1985 showed a significant association between either hospital or surgeon volume and inpatient mortality after AAA repair, although these findings may be limited by inadequate risk adjustment of the outcome measure and differ by type of aneurysms (intact vs. ruptured) being considered. Several studies have explored whether experience on related, but not identical, cases may lead to improved outcomes. One study found that hospital volume of surgery for ruptured aneurysms was not associated with postoperative inpatient mortality, but it was associated with fewer inpatient deaths for ruptured aneurysms, suggesting that high-volume hospitals may manage ruptured aneurysms more aggressively. [1] One study that evaluated the impact of total vascular surgery volume found a significant effect for both ruptured and intact aneurysms. [2] Empirical evidence shows that AAA repair volume and mortality—after adjusting for age, sex, and APR-DRG—are independently and negatively correlated with each other ($r=-.35$, $p<.001$). [3]

In some recent studies, in-hospital mortality rates for Abdominal Aortic Aneurysm (AAA) Repair Mortality were unchanged over time. The IQIs are easily applied to VA administrative data. They can be useful to tracks rate trends over time, reveal variation between sites, and for trend comparisons with other healthcare systems. [4]

The existence of a board quality committee was associated with higher likelihoods of adopting various oversight practices and lower mortality rates for abdominal aortic aneurysm repair measured by the Agency for Healthcare Research and Quality´s Inpatient Quality Indicators and the State Inpatient Databases. [5]

In assessing the ability of hospital mortality rankings to predict future performance, reliability adjustment was particularly important for pancreatic resection and AAA repair, hospital rankings based on reliability-adjusted mortality were superior at identifying hospitals likely to have the lowest future mortality. Without reliability adjustment, hospitals in the "best" quintile (2003-2004) with pancreatic resection had a mortality of 7.6 percent in 2005-2006; with reliability adjustment, the "best" hospital quintile had a mortality of 2.7 percent in 2003-2006. Similarly, without reliability adjustment, hospitals in the "best" quintile (2003-2004) with AAA repair had a mortality of 4.0 percent in 2005-2006; with reliability adjustment, the "best" hospital quintile had a mortality of 3.2 percent in 2005-2006. [6]

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):**
B. Testing, rating, and review were conducted by the project team. A full report on the literature review and empirical evaluation can be found in Refinement of the HCUP Quality Indicators by the UCSF-Stanford EPC, Detailed coding information for each QI is provided in the document Prevention Quality Indicators Technical Specifications. Rating of performance on empirical evaluations, ranged from 0 to 26. The scores were intended as a guide for summarizing the performance of each indicator on four empirical tests of precision (signal variance, area-level share, signal ratio, and R-squared) and five tests of minimum bias (rank correlation, top and bottom decile movement, absolute change, and change over two deciles)

1c.6 Method for rating evidence: The project team conducted extensive empirical testing of all potential indicators using the 1995-97 HCUP State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. The 1997 SID contains uniform data on inpatient stays in community hospitals for 22 States covering approximately 60% of all U.S. hospital discharges. The NIS is

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designed to approximate a 20% of U.S. community hospitals and includes all stays in the sampled hospitals. Each year of the NIS contains between 6 million and 7 million records from about 1,000 hospitals. The NIS combines a subset of the SID data, hospital-level variables, and hospital and discharge weights for producing national estimates. The project team conducted tests to examine three things: precision, bias, and construct validity.

Precision. The first step in the analysis involved precision tests to determine the reliability of the indicator for distinguishing real differences in provider performance. For indicators that may be used for quality improvement, it is important to know with what precision, or surety, a measure can be attributed to an actual construct rather than random variation.

For each indicator, the variance can be broken down into three components: variation within a provider (actual differences in performance due to differing patient characteristics), variation among providers (actual differences in performance among providers), and random variation. An ideal indicator would have a substantial amount of the variance explained by between-provider variance, possibly resulting from differences in quality of care, and a minimum amount of random variation. The project team performed four tests of precision to estimate the magnitude of between-provider variance on each indicator:

• Signal standard deviation was used to measure the extent to which performance of the QI varies systematically across hospitals or areas.

• Provider/area variation share was used to calculate the percentage of signal (or true) variance relative to the total variance of the QI.

• Signal-to-noise ratio was used to measure the percentage of the apparent variation in QIs across providers that is truly related to systematic differences across providers and not random variations (noise) from year to year.

• In-sample R-squared was used to identify the incremental benefit of applying multivariate signal extraction methods for identifying additional signal on top of the signal-to-noise ratio.

In general, random variation is most problematic when there are relatively few observations per provider, when adverse outcome rates are relatively low, and when providers have little control over patient outcomes or variation in important processes of care is minimal. If a large number of patient factors that are difficult to observe influence whether or not a patient has an adverse outcome, it may be difficult to separate the "quality signal" from the surrounding noise. Two signal extraction techniques were applied to improve the precision of an indicator:

• Univariate methods were used to estimate the "true" quality signal of an indicator based on information from the specific indicator and 1 year of data.

• Multivariate signal extraction (MSX) methods were used to estimate the "true" quality signal based on information from a set of indicators and multiple years of data. In most cases, MSX methods extracted additional signal, which provided much more precise estimates of true hospital or area quality.

Bias. To determine the sensitivity of potential QIs to bias from differences in patient severity, unadjusted performance measures for specific hospitals were compared with performance measures that had been adjusted for age and gender. All of the PQIs and some of the Inpatient Quality Indicators (IQIs) could only be risk-adjusted for age and sex. The 3M™ APR-DRG System Version 12 with Severity of Illness and Risk of Mortality subclasses was used for risk adjustment of the utilization indicators and the in-hospital mortality indicators, respectively. Five empirical tests were performed to investigate the degree of bias in an indicator:

• Rank correlation coefficient of the area or hospital with (and without) risk adjustment—gives the overall impact of risk adjustment on relative provider or area performance.

• Average absolute value of change relative to mean—highlights the amount of absolute change in performance, without reference to other providers' performance.

• Percentage of highly ranked hospitals that remain in high decile—reports the percentage of hospitals or areas that are in the highest deciles without risk adjustment that remain there after risk adjustment is performed.

• Percentage of lowly ranked hospitals that remain in low decile—reports the percentage of hospitals or areas that are in the lowest deciles without risk adjustment that remain there after risk adjustment is performed.

• Percentage that change more than two deciles—identifies the percentage of hospitals whose relative rank changes by a substantial percentage (more than 20%) with and without risk adjustment.

Construct validity. Construct validity analyses provided information regarding the relatedness or independence of the indicators. If quality indicators do indeed measure quality, then two measures of the same construct would be expected to yield similar results. The team used factor analysis to reveal underlying patterns among large numbers of variables—in this case, to measure the degree of relatedness between indicators. In addition, they analyzed correlation matrices for indicators.

1c.7 Summary of Controversy/Contradictory Evidence: Some users have questioned the inclusion of both ruptured and unruptured AAA in the denominator. However, the risk-adjustment model was well calibrated for these classes of patients. We also included ruptured status as a covariate in the model to improve the calibration further. **1c.8 Citations for Evidence (*other than guidelines*):** Updated citations will be presented in the May Steering Committee meeting [1] Kantonen I, Lepantalo M, Brommels M, et al. Mortality in ruptured abdominal aortic aneurysms. The Finnvasc Study Group. . Eur J Vasc Endovasc Surg 1999;17(3):208-12. [2] Amundsen S, Skjaerven R, Trippestad A, et al. Abdominal aortic aneurysms. Is there an association between surgical volume, surgical experience, hospital type and operative mortality? Members of the Norwegian Abdominal Aortic Aneurysm Trial. Acta Chir Scand 1990;156(4):323-7; discussion 327-8. [3] Nationwide Inpatient Sample (NIS). http://hcupnet.ahrq.gov/ [4] Borzecki AM, Christiansen CL, Loveland S, Chew P, Rosen AK. Trends in the inpatient quality indicators: the Veterans Health Administration experience. Med Care. 2010 Aug;48(8):694-702. [5] Jiang, H. Joanna; Lockee, Carlin; Bass, Karma; Fraser, Irene; Kiely, Robert. (2008). Board engagement in quality: findings of a survey of hospital and system leaders. Journal of Healthcare Management, 53, 2, 121(15) [6] Dimick, Justin B.; Staiger, Douglas O.; Birkmeyer, John D. Ranking hospitals on surgical mortality: the importance of reliability adjustment. Health Serv Res. 2010 Dec;45(6 Pt 1):1614-29. doi: 10.1111/j.1475-6773.2010.01158.x. Epub 2010 Aug 16. **1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number*):** EVAR for AAA represents an advance in patient care, serving as an effective alternative to traditional open surgical AAA repair, and is now the most common treatment method for AAA repair in the United States. **1c.10 Clinical Practice Guideline Citation:** http://www.sirweb.org/clinical/cpg/QI12.pdf **1c.11 National Guideline Clearinghouse or other URL:** Not Applicable **1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*):** Not Applicable **1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF)*: Not Applicable **1c.14 Rationale for using this guideline over others:** Not Applicable	
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-specs** **C☐** **P☐**
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):
Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

2a.2 **Numerator Time Window** (*The time period in which cases are eligible for inclusion in the numerator*):
Time window can be determined by user, but is generally a calendar year.

2a.3 **Numerator Details** (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*):
Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

2a.4 **Denominator Statement** (*Brief, text description of the denominator - target population being measured*):
Discharges, age 18 years and older, with ICD-9-CM AAA repair code procedure and a diagnosis of AAA in any field.

2a.5 **Target population gender:** Female, Male
2a.6 **Target population age range:** 18 and older

2a.7 **Denominator Time Window** (*The time period in which cases are eligible for inclusion in the denominator*):
Time window can be determined by user, but is generally a calendar year.

2a.8 **Denominator Details** (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions*):
Discharges, age 18 years and older, with ICD-9-CM AAA repair code procedure and a diagnosis of AAA in any field.
ICD-9-CM AAA repair procedure codes:
3834
AORTA RESECTION & ANAST
3844
RESECT ABDM AORTA W REPL
3864
EXCISION OF AORTA
3971
ENDO IMPLANT OF GRAFT IN AORTA

ICD-9-CM AAA diagnosis codes:
4413
RUPT ABD AORTIC ANEURYSM
4414
ABDOM AORTIC ANEURYSM

Exclude cases:
• missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1 =missing)
• transferring to another short-term hospital (DISP=2)
• MDC 14 (pregnancy, childbirth, and puerperium)

2a.9 **Denominator Exclusions** (*Brief text description of exclusions from the target population*): Exclude cases:
• missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1 =missing)
• transferring to another short-term hospital (DISP=2)
• MDC 14 (pregnancy, childbirth, and puerperium)

2a.10 **Denominator Exclusion Details** (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions*):
Exclude cases:
• missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter

M☐
N☐

(DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1 =missing)
• transferring to another short-term hospital (DISP=2)
• MDC 14 (pregnancy, childbirth, and puerperium)

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
Gender, age (5-year age groups), race / ethnicity, primary payer, custom

2a.12-13 Risk Adjustment Type: Risk adjustment method widely or commercially available

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
The predicted value for each case is computed using a hierarchical model (logistic regression with hospital random effect) and covariates for gender, age in years (in 5-year age groups), All Patient Refined-Diagnosis Related Group (APR-DRG) and APR-DRG risk-of-mortality subclass. The reference population used in the model is the universe of discharges for states that participate in the HCUP State Inpatient Databases (SID) for the year 2007 (updated annually), a database consisting of 43 states and approximately 30 million adult discharges. The expected rate is computed as the sum of the predicted value for each case divided by the number of cases for the unit of analysis of interest (i.e., hospital, state, and region). The risk adjusted rate is computed using indirect standardization as the observed rate divided by the expected rate, multiplied by the reference population rate.Risk adjustment factors: sex
age 18-24; age 25-29; age 30-34; age 35-39; age 40-44; age 45-49; age 50-54; age 55-59; age 60-64; age 65-69; age 70-74; age 75-79; age 80-84; age 85+
each age category*female
ADRG 1731 (other vascular procedures-minor)
ADRG 1732 (other vascular procedures-moderate)
ADRG 1733 (other vascular procedures-major)
ADRG 1734 (other vascular procedures-extreme)
ADRG 1691 (major thoracic and abdominal vascular procedures-minor)
ADRG 1692 (major thoracic and abdominal vascular procedures-moderate)
ADRG 1693 (major thoracic and abdominal vascular procedures-major)
ADRG 1694 (major thoracic and abdominal vascular procedures-extreme
ADRG 9999 (other)

2a.15-17 Detailed risk model available Web page URL or attachment: URL None
http://qualityindicators.ahrq.gov/downloads/iqi/IQI_Risk_Adjustment_Tables_(Version_4_2).pdf

2a.18-19 Type of Score: Rate/proportion
2a.20 Interpretation of Score: Better quality = Lower score
2a.21 Calculation Algorithm (*Describe the calculation of the measure as a flowchart or series of steps***):**
Each indicator is expressed as a rate, is defined as outcome of interest / population at risk or numerator / denominator. The AHRQ Quality Indicators (AHRQ QI) software performs five steps to produce the rates. 1) Discharge-level data is used to mark inpatient records containing the outcome of interest and 2) the population at risk. For provider indicators, the population at risk is also derived from hospital discharge records; for area indicators, the population at risk is derived from U.S. Census data. 3) Calculate observed rates. Using output from steps 1 and 2, rates are calculated for user-specified combinations of stratifiers. 4) Calculate expected rates. Regression coefficients from a reference population database are applied to the discharge records and aggregated to the provider or area level. 5) Calculate risk-adjusted rate. Use the indirect standardization to account for case-mix. 6) Calculate smoothed rate. A Univariate shrinkage factor is applied to the risk-adjusted rates. The shrinkage estimate reflects a reliability adjustment unique to each indicator. Full information on calculation algorithms and specifications can be found at http://qualityindicators.ahrq.gov/IQI_download.htm

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
Significance testing is not prescribed by the software. Users may calculate a confidence interval for the risk-adjusted rates and a posterior probability interval for the smoothed rates at a 95% or 99% level. Users may define the relevant benchmark and the methods of discriminating performance according to their application.

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)*:
Not applicable.

2a.24 Data Source (*Check the source(s) for which the measure is specified and tested)*
Electronic administrative data/claims

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.*)**:**
The data source is hospital discharge data such as the HCUP State Inpatient Databases (SID) or equivalent using UB-04 coding standards. The data collection instrument is public-use AHRQ QI software available in SAS or Windows versions

2a.26-28 Data source/data collection instrument reference web page URL or attachment: URL None
http://www.qualityindicators.ahrq.gov/software.htm

2a.29-31 Data dictionary/code table web page URL or attachment: URL None
http://www.qualityindicators.ahrq.gov/downloads/winqi/AHRQ_QI_Windows_Software_Documentation_V41a.pdf

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

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Hospital

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

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges

2b.2 Analytic Method *(type of reliability & rationale, method for testing)*:
Literature summary, expert panels and empirical analysis

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:
The relatively small number of AAA resections performed by each hospital suggests that mortality rates at the hospital level are likely to be unreliable. Empirical evidence shows that his indicator is precise, with a raw provider level mean of 21.5% and a substantial standard deviation of 26.8%.87
Relative to other indicators, a higher percentage of the variation occurs at the provider level, rather than the discharge level. The signal ratio (i.e., the proportion of the total variation across providers that is truly related to systematic differences in provider performance rather than random variation) is low, at 30.7%, indicating that some of the observed differences in provider performance.

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 Data/sample *(description of data/sample and size)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges surgery, has been identified as the most important predictor of mortality after elective AAA repair.93
Empirical evidence shows that AAA repair mortality is positively related to other post-procedural mortality measures, such as craniotomy (r=.28, p<.0001) and coronary artery bypass graft (CABG) (r=.17, p<.01).94

Veterans Integrated Service Networks´ (VISNs); and VA versus non-VA (Nationwide Inpatient Sample) using VA inpatient data (2004-2007). [1]

A survey of hospital and system leaders (presidents/chief executive officers (CEOs)) that was conducted in the first six months of 2006 with a total of 562 respondents. Hospital-level data for these composite measures

2c C☐ P☐ M☐ N☐

were produced by applying the IQI to the State Inpatient Databases (SID) of the Healthcare Cost and Utilization Project (HCUP) sponsored by AHRQ. The SID includes all-payer data on inpatient stays from virtually all community hospitals in each participating state. [2]

We used 100 percent national analytic files from the CMS for the calendar years 2003 through 2006. Medicare Provider Analysis and Review (MEDPAR) files, which contain hospital discharge abstracts for all fee-for-service acute care hospitalizations of all U.S. Medicare recipients, were used to create our main analytical datasets. The Medicare denominator file was used to assess patient vital status at 30 days. Using appropriate procedure codes fiom the International Classification of Diseases, version 9 (ICD-9 codes), we identified all patients aged 65-99 undergoing elective AAA repair and pancreatectomy. [3]

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
Literature summary, expert panels and empirical analysis

VA-and VISN-level IQI observed rates, risk-adjusted rates, and observed to expected ratios (O/Es). We examined the trends in VA-and VISN-level rates using weighted linear regression, variation in VISN-level O/Es, and compared VA to non-VA trends. [1]

A t-test was used to determine the significance of differences in quality measures. [2]

We first estimated risk-adjusted hospital mortality rates during 2003-2004. We defined mortality as death within 30 days of operation or before hospital discharge. We adjusted for patient age, gender, race, urgency of operation, median ZIP-code income, and coexisting medical conditions. Using logistic regression, we estimated the expected number of deaths in each hospital and then divided the observed deaths by this expected number of deaths to obtain the ratio of observed to expected mortality (O/E ratio). We then multiplied the O/E ratio by the average mortality rate to obtain a risk-adjusted mortality rate for each hospital. We next used hierarchical modeling techniques to adjust these mortality estimates for reliability. Using random effects logistic regression models, we generated empirical Bayes predictions of mortality for each hospital. [3]

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
The correlation between hospital or physician characteristics and in-hospital mortality in most studies supports the validity of in-hospital mortality as a measure of quality.[1, 2] Finally, excessive blood loss, which is a potentially preventable complication of surgery, has been identified as the most important predictor of mortality after elective AAA repair.[3]
Empirical evidence shows that AAA repair mortality is positively related to other post-procedural mortality measures, such as craniotomy (r=.28, p<.0001) and coronary artery bypass graft (CABG) (r=.17, p<.01).94
References:
[1] WH, Parker MA, Feinglass J, et al. The importance of surgeon volume and training in outcomes for vascular surgical procedures. J Vasc Surg 1999;29(5):768-76.

[2] Rutledge R, Oller DW, Meyer AA, et al. A statewide, population-based time-series analysis of the outcome of
ruptured abdominal aortic aneurysm. Ann Surg 1996;223(5):492-502.

[3]Pilcher DB, Davis JH, Ashikaga T, et al. Treatment of abdominal aortic aneurysm in an entire state over 7½ years. Am J Surg 1980;139(4):487-94.

[4]Nationwide Inpatient Sample.
VA in-hospital mortality rates for Abdominal Aortic Aneurysm (AAA) Repair Mortality were unchanged over time. The IQIs are easily applied to VA administrative data. They can be useful to tracks rate trends over time, reveal variation between sites, and for trend comparisons with other healthcare systems. [1]

The existence of a board quality committee was associated with higher likelihoods of adopting various oversight practices and lower mortality rates for abdominal aortic aneurysm repair measured by the Agency for Healthcare Research and Quality´s Inpatient Quality Indicators and the State Inpatient Databases. [2]

In assessing the ability of hospital mortality rankings to predict future performance, reliability adjustment was particularly important for pancreatic resection and AAA repair, hospital rankings based on reliability-adjusted mortality were superior at identifying hospitals likely to have the lowest future mortality. Without reliability adjustment, hospitals in the "best" quintile (2003-2004) with pancreatic resection had a mortality of 7.6 percent in 2005-2006; with reliability adjustment, the "best" hospital quintile had a mortality of 2.7 percent in 2003-2006. Similarly, without reliability adjustment, hospitals in the "best" quintile (2003-2004) with AAA repair had a mortality of 4.0 percent in 2005-2006; with reliability adjustment, the "best" hospital quintile had a mortality of 3.2 percent in 2005-2006. [3]

References

[1] Borzecki AM, Christiansen CL, Loveland S, Chew P, Rosen AK. Trends in the inpatient quality indicators: the Veterans Health Administration experience. Med Care. 2010 Aug;48(8):694-702.
[2] Jiang, H. Joanna; Lockee, Carlin; Bass, Karma; Fraser, Irene; Kiely, Robert. (2008). Board engagement in quality: findings of a survey of hospital and system leaders. Journal of Healthcare Management, 53, 2, 121(15)
[3] Dimick, Justin B.; Staiger, Douglas O.; Birkmeyer, John D. Ranking hospitals on surgical mortality: the importance of reliability adjustment. Health Serv Res. 2010 Dec;45(6 Pt 1):1614-29. doi: 10.1111/j.1475-6773.2010.01158.x. Epub 2010 Aug 16.

2d. Exclusions Justified

2d.1 Summary of Evidence supporting exclusion(s):
Exclusions remove cases where the outcome of interest is less likely to be preventable or more likely to be preventable or with no or very low risk

2d.2 Citations for Evidence:
Updated citations will be presented in the May Steering Committee meeting

Refinement of the HCUP Quality Indicators (Technical Review), May 2001
http://qualityindicators.ahrq.gov/downloads/technical/qi_technical_review.zip

2d.3 Data/sample *(description of data/sample and size)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges

2d.4 Analytic Method *(type analysis & rationale)*:
Expert panel and descriptive analyses stratified by exclusion categories

2d.5 Testing Results *(e.g., frequency, variability, sensitivity analyses)*:
Refinement of the HCUP Quality Indicators (Technical Review), May 2001
http://qualityindicators.ahrq.gov/downloads/technical/qi_technical_review.zip

2d
C☐ P☐ M☐ N☐ NA☐

2e. Risk Adjustment for Outcomes/ Resource Use Measures

2e.1 Data/sample *(description of data/sample and size)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges

2e.2 Analytic Method *(type of risk adjustment, analysis, & rationale)*:
Risk-adjustment models use a standard set of categories based on readily available classification systems for demographics, severity of illness and comorbidities. Within each category, covariates are initially selected based on a minimum of 30 cases in the outcome of interest. Then a stepwise regression process on a development sample is used to select a parsimonious set of covariates where p<.05. Model is then tested on a validation sample

2e.3 Testing Results *(risk model performance metrics)*:
c 0.909

2e.4 If outcome or resource use measure is not risk adjusted, provide rationale: Not applicable

2e
C☐ P☐ M☐ N☐ NA☐

2f. Identification of Meaningful Differences in Performance

2f
C☐

2f.1 Data/sample from Testing or Current Use *(description of data/sample and size)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharges

2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance *(type of analysis & rationale)*:
Posterior probability distribution parameterized using the Gamma distribution

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)*:

5th	25th	Median	75th	95th
0.025908	0.036333	0.045065	0.055099	0.071948

P☐ M☐ N☐

2g. Comparability of Multiple Data Sources/Methods

2g.1 Data/sample *(description of data/sample and size)*: Not applicable

2g.2 Analytic Method *(type of analysis & rationale)*:
Not applicable

2g.3 Testing Results *(e.g., correlation statistics, comparison of rankings)*:
Not applicable

2g C☐ P☐ M☐ N☐ NA☐

2h. Disparities in Care

2h.1 If measure is stratified, provide stratified results *(scores by stratified categories/cohorts)*: Information on results are noted below. Also 1b2 provides results by age, gender, micropolitian and metropolitian and payer.

Median income of patient´s ZIP code:
1) Estimate 2) Standard error 3) P-value: Relative to marked group-c 4) P-value:
2007 relative to 2006
First quartile (lowest income) 59.088 2.445 0.242 0.002
Second quartile 54.793 2.336 0.966 0.011
Third quartile 58.174 2.397 0.357 0.085
Fourth quartile (highest income)c 54.942 2.561 0.060

From previous testing, known predictors of in-hospital mortality include whether the aneurysm is intact or ruptured, age, female gender, admission through an emergency room, various comorbidities such as renal failure and dysrhythmias, and Charlson's comorbidity index.[1, 2, 3]
References:
[1] Manheim LM, Sohn MW, Feinglass J, et al. Hospital vascular surgery volume and procedure mortality rates in California, 1982-1994. J Vasc Surg 1998;28(1):45-56.
[2] Hannan EL, Kilburn H, Jr., O'Donnell JF, et al. A longitudinal analysis of the relationship between in-hospital mortality in New York state and the volume of abdominal aortic aneurysm surgeries performed. Health Serv Res 1992;27(4):517-42.
[3] Wen SW, Simunovic M, Williams JI, et al. Hospital volume, calendar age, and short term outcomes in patients undergoing repair of abdominal aortic aneurysm: the Ontario experience, 1988-92. J Epidemiol Community Health 1996;50(2):207-13.

RACE/ETHNICITY	Rate per 100
White	4.52
Black	5.48
Hispanic	5.40
Asian NH/PI	5.33
Amer Indian/AN	4.58
Other	4.66

Source: 2008 State Inpatient Databases (SID) (N=39,963)

2h C☐ P☐ M☐ N☐ NA☐

2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans: Users may stratify based on gender and race/ethnicity	
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*)**:** California (state) Hospital Inpatient Mortality Indicators for California http://www.oshpd.ca.gov/HID/Products/PatDischargeData/AHRQ/iqi-imi_overview.html Florida (state) Florida Health Finder http://www.floridahealthfinder.gov/ Kentucky (Norton Healthcare, a hospital system) Norton Healthcare Quality Report http://www.nortonhealthcare.com/body.cfm?id=157 Kentucky (state hospital association) Kentucky Hospital Association Quality Data http://info.kyha.com/QualityData/IQISite/ Maine (state) Maine Health Data Organization http://gateway.maine.gov/mhdo2008Monahrq/home.html Massachusetts (state) My HealthCare Options http://www.mass.gov/healthcareqc Minnesota (Minnesota Community Measurement) Minnesota Health Scores www.mnhealthscores.org New Jersey (state) Find and Compare Quality Care in NJ Hospitals http://www.nj.gov/health/healthcarequality/	**3a** **C** ☐ **P** ☐ **M** ☐ **N** ☐

New York (health care coalition)
New York State Hospital Report Card
http://www.myhealthfinder.com/

Oregon (state)
Oregon Hospital Quality Indicators
http://www.oregon.gov/OHPPR/HQ/

Texas (state)
Reports on Hospital Performance
http://www.dshs.state.tx.us/thcic/

Vermont (state)
Dept of Banking, Insurance, Securities & Health Care Administration Comparison Report
http://www.bishca.state.vt.us/health-care/hospitals-health-care-practitioners/2009-vermont-hospital-report-card

Washington (health care coalition)
Washington State Hospital Report Card
http://www.myhealthfinder.com/wa09/index.php

Wisconsin (state hospital association)
CheckPoint
http://www.wicheckpoint.org/index.aspx

The measure is also reported on HCUPnet:
http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=EB57801381F71C41&Form=MAINSEL&JS=Y&Action=%3E%3ENext%3E%3E&_MAINSEL=AHRQ%20Quality%20Indicators

This measure is used in the MONAHRQ system that is provided for public reporting and quality improvement throughout the United States: http://monahrq.ahrq.gov/

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***):**
University Healthcare Consortium - An alliance of 103 academic medical centers and 219 of their affiliated hospitals. Reporting the AHRQ QIs to their member hospitals. (see www.uhc.edu. Note: measure results reported to hospitals; not reported on site).

Dallas Fort Worth Hospital Council – Reporting on measure results to over 70 hospitals in Texas (see www.dfwhc.ord. Note: measure results reported to hospitals; not reported on site).

Norton Healthcare - a multi-hospital system in Kentucky (see http://www.nortonhealthcare.com/about/Our_Performance/index.aspx)

Ministry Health Care - a multi-hospital system in Wisconsin (see http://ministryhealth.org/display/router.aspx. Note: measure results reported to hospitals; not reported on site).

Minnesota Hospital Association
http://www.mnhospitals.org/ Note: measure used in quality improvement. Not reported publicly by the association)

Premier - Premier´s "Quality Advisor" tool provides performance reports to approximately 650 hospitals for their use in monitoring and improving quality. Hospitals receive facility specific reports on this measure in Quality Advisor.

This measure is used in the MONAHRQ system that is provided for public reporting and quality improvement

throughout the United States: http://monahrq.ahrq.gov/

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)*: AHRQ 2007 State Inpatient Databases (SID) with 4,000 hospitals and 30 million adult discharge

3a.5 **Methods** *(e.g., focus group, survey, QI project)*:
A research team from the School of Public Affairs, Baruch College, under contracts with the Department of Public Health, Weill Medical College and Battelle, Inc., has developed a pair of Hospital Quality Model Reports at the request of the Agency for Healthcare Research & Quality (AHRQ). These reports are designed specifically to report comparative information on hospital performance based on the AHRQ Quality Indicators (QIs). The work was done in close collaboration with AHRQ staff and the AHRQ Quality Indicators team.
The Model Reports (discussed immediately above) are based on:
• Extensive search and analysis of the literature on hospital quality measurement and reporting, as well as public reporting on health care quality more broadly;
• Interviews with quality measurement and reporting experts, purchasers, staff of purchasing coalitions, and executives of integrated health care delivery systems who are responsible for quality in their facilities;
• Two focus groups with chief medical officers of hospitals and/or systems and two focus groups with quality managers from a broad mix of hospitals;
• Four focus groups with members of the public who had recently experienced a hospital admission; and
• Four rounds of cognitive interviews (a total of 62 interviews) to test draft versions of the two Model Reports with members of the public with recent hospital experience, basic computer literacy but widely varying levels of education.

3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:
Given the above review of the literature and original research that was conducted, a Model report was the result that could help sponsors use the best evidence on public reports so they are most likely to have the desired effects on quality.

3b/3c. Relation to other NQF-endorsed measures

3b.1 **NQF # and Title of similar or related measures:**
Leapfrog survival predicator

(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?**
The Leapfrog measure is based on the AHRQ specification, but is not risk-adjusted

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:**
The AHRQ indicator is risk-adjusted and maintained annually

5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:**
The AHRQ indicator is paired with a volume indicator, is included in a composite, and is risk-adjusted

3c
C☐ P☐ M☐ N☐ NA☐

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?** 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.** Coding professionals follow detailed guidelines, are subject to training and credentialing requirements, peer review and audit.	4d C☐ P☐ M☐ N☐
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:** None 4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** Administrative data are collected as part of the routine operations. Some staff time is required to download and execute the software from the AHRQ webs site, which is available at no cost. 4e.3 **Evidence for costs:** Administrative data are collected as part of the routine operations. Some staff time is required to download and execute the software from the AHRQ webs site, which is available at no cost. 4e.4 **Business case documentation:** Administrative data are collected as part of the routine operations. Some staff time is required to download and execute the software from the AHRQ webs site, which is available at no cost.	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
Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850

Co.2 Point of Contact
John, Bott, MSSW, MBA, John.Bott@AHRQ.hhs.gov, 301-427-1317-

Measure Developer If different from Measure Steward
Co.3 Organization
Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850

Co.4 Point of Contact
John, Bott, MSSW, MBA, John.Bott@AHRQ.hhs.gov, 301-427-1317-

Co.5 Submitter If different from Measure Steward POC
John, Bott, MSSW, MBA, John.Bott@AHRQ.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality

Co.6 Additional organizations that sponsored/participated in measure development
UC Davis,
Stanford University,
Battelle Memorial Institute

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.
None

Ad.2 If adapted, provide name of original measure: None
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: 2001
Ad.7 Month and Year of most recent revision: 10, 2010
Ad.8 What is your frequency for review/update of this measure? Annual
Ad.9 When is the next scheduled review/update for this measure? 05, 2011

Ad.10 Copyright statement/disclaimers: The AHRQ QI software is publicly available; no copyright disclaimers

Ad.11 -13 Additional Information web page URL or attachment: URL
http://www.qualityindicators.ahrq.gov/downloads/technical/qi_technical_review.zip

Date of Submission (*MM/DD/YY*)**:** 04/05/2011

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 #:** 1523 **NQF Project:** Surgery Endorsement Maintenance 2010

MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** In-hospital mortality following elective open repair of small AAAs
De.2 **Brief description of measure:** Percentage of aymptomatic patients undergoing open repair of small abdominal aortic aneurysms (AAA)who die while in hospital. This measure is proposed for both hospitals and individual providers.
1.1-2 **Type of Measure:** Outcome De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Submitted SVS measure: In-hospital mortality following elective open repair of small AAAs
De.4 **National Priority Partners Priority Area:** Population health, Safety, Overuse De.5 **IOM Quality Domain**: Effectiveness, Efficiency, Safety De.6 **Consumer Care Need:** Staying healthy

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:** Agreement With Measure Stewards_Agreement Between_National Quality Forum (12-6-2010)-634272342848701938.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:** Public reporting, Internal quality improvement Accountability, Payment incentive	**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, Patient/societal consequences of poor quality 1a.2 1a.3 **Summary of Evidence of High Impact:** An international population-based study found that an aneurysm was present in 8.9% of men and 2.2% women (p < 0.001).(1) In the United States, ruptured AAAs are the 15th leading casue of death overall and the 10th leading casue of death in males over 55 years, a rate than has held steady for the past 2 decades. (2) Ruptured aneurysms are fatal in about 80% of cases. (3) 1a.4 **Citations for Evidence of High Impact:** (1) Singh K et al. Am. J. Epidemiol. (2001) 154 (3): 236-244. (2) Fillinger M. (2010) Abdominal Aortic Aneurysms: Evaluation and Decision Making. In J. Cronenewett & KW. Johnston (Eds.), Rutherford´s Vascular Surgery (1928-1948) Saunders Elsevier. Philadelphia. (3) May J, White GH, Stephen MS, Harris JP. J Vasc Surg. 2004 Nov;40(5):860-6.	**1a** C☐ P☐ M☐ N☐
1b. Opportunity for Improvement 1b.1 **Benefits (improvements in quality) envisioned by use of this measure:** Elective AAA repair is offered to prolong life by avoiding AAA rupture, which is fatal in more than 85% of cases. Rupture risk is primarily	**1b** C☐ P☐ M☐

assess by AAA diameter, with larger AAAs more prone to rupture. Surgical treatment carries risk, however, of mortality and morbidity, which must be balanced against the risk of rupture in order to determine which patients will benefit from elective repair.

Based on the UK small aneurysm trial, the accepted diameter threshold for elective AAA repair is 5.5 cm, although women have a slightly higher risk than men, so a threshold of 5 cm is usually recommended for women. The key concept of this proposed measure is that patients who are at low risk for AAA rupture (<6cm dia in men and <5.5 cm dia in women) should ONLY be offered elective AAA repair if their predicted operative mortality is low. This concept avoids the need for risk adjustment, since this is implicit in the decision to offer elective repair of small AAAs. This measure will highlight variation in proper patient selection by reporting unadjusted mortality rates for surgery in patients with small AAAs in whom this rate should be universally low. Providers or hospitals with high mortality rates are either not performing safe surgery or are not properly selecting low risk patients. The measure specifically excludes patients with larger AAAs because risk adjustment would be needed for such cases, and accepted risk adjustment algorithms are not available.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
There is significant regional variation in rates of open AAA repair, indicating a performance gap. In 27 hospital referral regions, rates of AAA repair were at least 30% higher than the United States average of 1.0 per 1,000 Medicare
enrollees. In 44 hospital referral regions, rates were more than
25% lower than the national average.(1)

Where these data have been monitored and reported to providers in VSGNE since 2003, among 12 centers and 55 providers treating 1289 patients with small AAAs the median mortality rate for men and women with small AAAs as defined above is 0%, but the range is 0-10%, indicating both a perfomance gap and opportunity for further improvement.

1b.3 Citations for data on performance gap:
(1)Dartmouth-CMS-FDA Collaborative, "Trends and Regional Variation in Abdmonial Aortic Anweurysm Repair, February 1, 2006.

1b.4 Summary of Data on disparities by population group:
Such data will become available if this measure is adopted for reporting and used by more centers with more varied population demographics than found in the New England region.

1b.5 Citations for data on Disparities:
not available

N☐

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*)**:** discussed above

1c.2-3. Type of Evidence: Cohort study, Expert opinion, Meta-analysis

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
The endpoint of inhospital mortality is the accepted primary endpoint for both elective AAA repair. Variation in outcome has been established in randomized trials,cohort studies and meta analyses. This outcome measure has face validity among all providers of this service. Studies cited above have shown substantial variation in outcomes by provider when elective AAA repair is performed in patients with small AAAs.

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):**
Motality is the reporting standard recommended by the Society for Vascular Surgery, and has been used in multiple RCTs.

1c
C☐
P☐
M☐
N☐

1c.6 Method for rating evidence: Expert opinion. **1c.7 Summary of Controversy/Contradictory Evidence:** None **1c.8 Citations for Evidence (*other than guidelines*):** Fillinger M. (2010) Abdominal Aortic Aneurysms: Evaluation and Decision Making. In J. Cronenewett & KW. Johnston (Eds.), Rutherford´s Vascular Surgery (1928-1948) Saunders Elsevier. Philadelphia. **1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number*):** None **1c.10 Clinical Practice Guideline Citation:** None **1c.11 National Guideline Clearinghouse or other URL:** None **1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*):** N/A **1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF*): N/A **1c.14 Rationale for using this guideline over others:** Mortality is the accepted endpoint used in all trials. Restricting the AAA risk by confining the analysis to small AAAs is explained above.	
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*): Mortality following elective open repair of asymptomatic AAAs in men with < 6 cm dia and women with < 5.5 cm dia AAAs **2a.2 Numerator Time Window (*The time period in which cases are eligible for inclusion in the numerator*):** Lifetime for provider reporting, annual for hospital reporting **2a.3 Numerator Details (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*):** A registry that includes hospitalization details, AAA diameter and discharge status is required to identify patients for numerator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who died in hospital following elective open infrarenal AAA repair if their aneurysm was asymptomatic and small (< 6cm	**2a-specs** **C☐** **P☐** **M☐** **N☐**

dia in men, <5.5 cm dia in women, judged by preoperative imaging (CT, MR or ultrasound)).

2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured***):**
All elective open repairs of asymptomatic AAAs in men with < 6 cm dia and women with < 5.5 cm dia AAAs

2a.5 Target population gender: Female, Male
2a.6 Target population age range: 18 years or older

2a.7 Denominator Time Window (*The time period in which cases are eligible for inclusion in the denominator***):**
Lifetime for provider reporting, annual for hospital reporting

2a.8 Denominator Details (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
A registry that includes hospitalization details, AAA diameter and discharge status is required to identify patients for denominator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who underwent elective open AAA repair are included if their aneurysm was asymptomatic and small (< 6cm dia in men, <5.5 cm dia in women, judged by preoperative imaging(CT, MR or ultrasound)).

2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population***):** > 6 cm minor diameter - men
> 5.5 cm minor diameter - women
Symptomatic AAAs that required urgent/emergent (non-elective) repair

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Patients undergoing non-elective open repair of symptomatic AAAs or those with AAAs larger than the diameters noted above.

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
Not required

2a.12-13 Risk Adjustment Type: No risk adjustment necessary

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
See "Scientific Acceptablility" section for rationale

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 = Lower score
2a.21 Calculation Algorithm (*Describe the calculation of the measure as a flowchart or series of steps***):**
Identify denominator, exclude non-elective repair of symptomatic or ruptured patients and men with AAA >6 cm, and women with AAA >5.5, find number of deaths
Outcome = deaths/ # cases

2a.22 Describe the method for discriminating performance *(e.g., significance testing)*:
Standard statistical comparison of rates to provide confidence levels to discriminate meaningful differences from the mean.

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)*
Registry data

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.):
Society for Vascular Surgery Vascular Quality Initiative Registry
Vascular Study Group of New England Registry

2a.26-28 **Data source/data collection instrument reference web page URL or attachment:** Attachment Open_AAA_Repair_v1.9.xlsx

2a.29-31 **Data dictionary/code table web page URL or attachment:** Attachment OPEN AAA defs v.01.09.doc

2a.32-35 **Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Clinicians: Individual, Clinicians: Group, Facility/Agency, Can be measured at all levels

2a.36-37 **Care Settings** (*Check the setting(s) for which the measure is specified and tested)*
Hospital

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

TESTING/ANALYSIS

2b. Reliability testing

2b.1 **Data/sample** *(description of data/sample and size)*: A random sample of 100 patient records representing 5 procedures relevant to the measure from 5 different hospitals based on data collected during the past 2 years. In addition, in-hospital mortality was examined by claims based analysis of 7,205 patients discharged and recorded in the VSGNE registry between 2003 to 2007.

2b.2 **Analytic Method** *(type of reliability & rationale, method for testing)*:
A nurse abstractor completed a form based on medical record review for the variables relevant to this measure. The results of this chart review were then compared with the original registry data. The Kappa statistic was used to judge reliability of the data. For mortality validation, claims data from each of 12 hospitals were matched to patient identified data within the VSGNE registry to compare discharge status (alive vs. dead). Any discrepencies were then further evaluated based on a medical record audit.

2b.3 **Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:
The key variables for this measure and testing results were:

1. Correct procedure (open infrarenal AAA repair) performed. Kappa =1.0
2. AAA diameter: Based on 60 measurement, the mean diameter was 56.7 mm in the registry, 56.6 mm in the chart audit, no significant difference. Further, in on cases was the category of size based on the cut points of 6 cm in men and 5.5 cm in women different, Kappa = 1.0 for these categories.
3. Hospital mortality: Kappa = .91 (SE .01)
4. Elective(vs urgent or emergent); Kappa=1.0

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 **Data/sample** *(description of data/sample and size)*: See reliability testing

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
comparison of rates with published literature

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
In VSGNE, in hospital mortality for open AAA repair is 4-8%, and shows appropriate variation among hospitals, using this measure. This corresponds well to the published literature for elective AAA repair.

2c C☐ P☐ M☐ N☐

2d. Exclusions Justified — **2d**

2d.1 Summary of Evidence supporting exclusion(s):
Large clinical trials have demonstrated the relative safety of observation AAAs with a minimum diameter of less than 5.5 cm.(1)

2d.2 Citations for Evidence:
(1) Fillinger M. (2010) Abdominal Aortic Aneurysms: Evaluation and Decision Making. In J. Cronenewett & KW. Johnston (Eds.), Rutherford´s Vascular Surgery (1928-1948) Saunders Elsevier. Philadelphia.

2d.3 Data/sample *(description of data/sample and size)*: 1201 patients undergoing open elective AAA repair in VSGNE, all patients, 2003-2010. 886 men, 315 women

2d.4 Analytic Method *(type analysis & rationale)*:
rate calculation based on AAA dia size

2d.5 Testing Results *(e.g., frequency, variability, sensitivity analyses)*:
Men, < 6cm AAA, mdn 0% mortality, range 0-4.1% among 10 centers
Men, >= 6 cm dia, mdn 0% mortality, range 0-10.4% among 10 centers

Women, < 5.5 cm dia AAAs, mdn mortality 0%, range 0-10% among 9 centers
Women, >= 5.5 cm dia AAAs, mdn mortality 1.1%, range 0-20% among 9 centers

C☐ P☐ M☐ N☐ NA☐

2e. Risk Adjustment for Outcomes/ Resource Use Measures

2e.1 Data/sample *(description of data/sample and size)*: This measure was designed to avoid the need for risk adjustment, because risk adjustment is complex for AAA repair, and accepted algorithms do not yet exist. In patients with small AAAs, with low rupture risk, it is incumbent on the surgeon to factor in the risk-benefit of elective, prophylactic repair, since a high operative mortality will eliminate any benefit of AAA repair. Women have higher rupture risk than men, so by focusing this measure on AAAs < 5.5 cm in women and < 6 cm in men, the non-risk-adjusted mortality is a fair comparison of surgical outcome in the opinion of the sponsor, the Society for Vascular Surgery, and it represents a very important outcome to measure.

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)*: see section 1.b.3 and above 2,d,5

2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance *(type of analysis & rationale)*:
Standard statistial analysis to determine 95% confidence interval for hospitals and providers to determine practical difference from mean

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)*:

2f
C☐ P☐ M☐ N☐

2g. Comparability of Multiple Data Sources/Methods

2g.1 Data/sample *(description of data/sample and size)*: no other data sources available

2g
C☐ P☐ M☐

2g.2 Analytic Method *(type of analysis & rationale)*: **2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*:	N☐ NA☐
2h. Disparities in Care **2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: **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*): Data from SVS VQI and VSGNE are reported to each hospital and provider in a format that can be transmitted to an appropriate public reporting mechanism. **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***):** Vascular Study Group of New England www.vsgne.org Data have been successfully collected in this quality registry since 2003, and reports provided to participating physicians and hospitals about their rates of outcomes. These results are used by the regional quality group to provide benchmark reporting, and to stimulate regional quality improvement projects. **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)*: VSGNE samples previously described **3a.5 Methods** *(e.g., focus group, survey, QI project)*: Semi-annual meetings of providers in VSGNE **3a.6 Results** *(qualitative and/or quantitative results and conclusions)*: Benchamrk reports of this outcome measure have been provided to VSGNE member physician and hospitals since 2003, and discussed at semi-annual meetings. There have been no questions about interpretability.	**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 same target population), Describe why it is a more valid or efficient way to measure quality:**	**3c** C☐ P☐ M☐ N☐ NA☐
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.** Small size measurements of AAA should not significantly impact the measure, and symptom status is easily validated during chart review. We have not found inaccuracy in this measure.	**4d** C☐ P☐ M☐ N☐

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:
In the VSGNE experience which has been tracking hosptital mortality as a major endpoint since 2003, we have not experienced any difficulty with obtaining data related to this endpoint. Our percent missing for this variable has been less than 1%.

4e.2 Costs to implement the measure (*costs of data collection, fees associated with proprietary measures*)**:**
In the context of the VSGNE and SVS VQI registries, there is no additional cost as all of these data are already collected.

4e.3 Evidence for costs:

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
Society for Vascular Surgery, 633 N. St. Clair, 24th floor, Chicago, Illinois, 60611

Co.2 Point of Contact
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-

Measure Developer If different from Measure Steward
Co.3 Organization
Society for Vascular Surgery, 633 N. St. Clair, 24th floor, Chicago, Illinois, 60611

Co.4 Point of Contact
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-

Co.5 Submitter If different from Measure Steward POC
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-, Society for Vascular Surgery

Co.6 Additional organizations that sponsored/participated in measure development

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.
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:** 2010 **Ad.7 Month and Year of most recent revision:** 12, 2010 **Ad.8 What is your frequency for review/update of this measure?** **Ad.9 When is the next scheduled review/update for this measure?**
Ad.10 Copyright statement/disclaimers:
Ad.11 -13 Additional Information web page URL or attachment:
Date of Submission (*MM/DD/YY*)**:** 03/27/2011

Open AAA Repair

Last Name | First Name | MI

Date of Birth | MRN | SSN

General Information

Zip Code

Ethnicity ☐ Not Hispanic or Latino ☐ Hispanic or Latino

Height ☐ inches or cm

Weight ☐ lbs or kg

Visit code (not required)

Admit Date

Surgeon

Discharge Status ☐ home; ☐ rehab unit; ☐ nursing home ☐ dead ☐ other hospital; ☐ skilled nursing facility;

*If dead, date of death

Transferred from? ☐ no; ☐ hospital; ☐ rehab unit;

Gender ☐ male; ☐ female

Race ☐ American Indian or Alaskan Native; ☐ Asian; ☐ Black or African America ☐ Native Hawaiian or other Pacific Islander; ☐ White ☐ More than 1 race; ☐ Unknown/other

Discharge Date

Surgery Date

Does the patient have Medicare Part B? ☐ no; ☐ yes

Demographics

Smoking ☐ Never; ☐ prior (>1 yr); ☐ current (within yr);

Diabetes ☐ none; ☐ diet; ☐ oral meds ☐ insulin;

CAD symptoms ☐ none; ☐ Hx MI but no sx; ☐ stable angina; ☐ unstable angina or MI < 6 mos;

CHF ☐ none; ☐ asymp, hx CHF; ☐ mild; ☐ severe;

Dialysis ☐ no; ☐ functioning transplant; ☐ on dialysis;

Stress Test ☐ normal; ☐ (+) ischemia; ☐ (+) MI; ☐ (+)both; ☐ not dor

ASA Class ☐ 1 normal/healthy; ☐ 2 w/mild systemic dx; ☐ 3 w/sever s ☐ 4 w/severe systemic dx that is a constant threat to life; ☐ 5 moribund, not expected to survive w/o op;

Hypertension ☐ no; ☐ yes (>=140/90 or history);

Beta blockers ☐ no; ☐ Pre-op 1-30 days; ☐ Chronic >30 days; ☐ No-intolerant; ☐ Op day only;

CABG/PTCA ☐ non ☐ <5yr; ☐ >=5yrs ago;

COPD ☐ no ☐ not treated; ☐ meds ☐ on home oxygen;

Creatinine ☐ mg/dl or µmol/L

Pre-adm Living ☐ home ☐ nursing ho

Pre-op Hemoglobin ☐ g/dl or g/L

Previous arterial

Bypass ☐ no; ☐ yes

Aneur Repair ☐ no; ☐ yes

Major Amp ☐ no; ☐ yes

CEA ☐ no; ☐ yes

PTA/Stent ☐ no; ☐ yes

Pre-Op Medications

ASA ☐ no; ☐ yes ☐ intolerant;

Statin ☐ no; ☐ yes; ☐ intolerant;

Plavix ☐ no; ☐ yes ☐ intolerant;

History

Symptoms

Family History of AAA ☐ no; ☐ yes

Ejection Fraction ☐ <30%; ☐ 30-50%; ☐ >50%; ☐ not do ☐ unknown

Iliac Aneurysm ☐ no; ☐ unilatera ☐ bilateral;

Urgency ☐ elective; ☐ symptomatic; ☐ ruptured

Prior Aortic Surgery ☐ none; ☐ AAA; ☐ SAAA; ☐ bypas ☐ other;

Maximum AP AAA Diam ____ mm

Max Diameter ____ mm

Fill out the fields below if Urgency equals ruptured.

Lowest pre-intubation BP ____ Systolic- mmHg

Cardiac Arrest ☐ no; ☐ yes;

Time: Admission to Incision ____ hours

Mental Status ☐ norma ☐ disoriented; ☐ unconscious;

Time: Symptoms to Incision ____ hours

Delayed Closure ☐ no; ☐ yes

Procedure

Anesthesia ☐ general; ☐ general & epidural;

Exposure ☐ anterior; ☐ retroperitoneal;

Graft Type ☐ dacron, woven; ☐ dacron, knitted; ☐ dacron, coated; ☐ PTE; ☐ non-autologous biologic;

IMA at Completion ☐ occluded; ☐ ligated; ☐ reimplanted;

Mannitol ☐ no; ☐ yes;

Autotransfusion ____ ml

Total Procedure Time ____ minutes

Conversion from Endo AAA ☐ no; ☐ earl ☐ late

Distal Anastomosis ☐ aort ☐ CIA ☐ EIA; ☐ CFA

Hypogastric ligated/occluded ☐ non ☐ single; ☐ both;

Heparin ☐ no; ☐ yes;

EBL ____ ml

PRBC (in OR) ____ units

Skin Prep ☐ chlorhexadine; ☐ chlor+iodine; ☐ all 3; ☐ alcohol; ☐ chlor+alcohol; ☐ iodine; ☐ iodine+alcohol;

Renal / Visceral ischemic time ____ minutes

Graft Body Diameter ____ mm

Proximal Clamp Position ☐ infrarenal; ☐ above both renals; ☐ supraceliac; ☐ above 1 renal;

Cold Renal Perfusion ☐ no; ☐ yes

Crystalloid ____ ml

Heart Rate:

On Arrival in OR ____ bpm

Highest intra-op ____

Concomitant Procedure:

Thromboembolectomy ☐ no; ☐ yes

Infrainguinal Bypass ☐ no; ☐ yes

Renal Bypass ☐ no; ☐ yes

Other Abdominal ☐ no; ☐ yes

Post-Op Data

Time to Extubation ☐ in OR ☐ <12 hrs; ☐ 12-24 hrs; ☐ >=24 hrs;

Transfusion # Units PRBC ____ # of units transfused

CHF ☐ no; ☐ yes

Leg Ischemia/Emboli ☐ no; ☐ yes, rx w/o surgery; ☐ required surgery ☐ amputation

Return to OR ☐ no; ☐ yes

Stroke ☐ none; ☐ minor; ☐ major;

Vasopressors required post-op ☐ no; ☐ yes

Myocardial Infaction ☐ no; ☐ troponin c ☐ EKG or clinical;

Respiratory ☐ no; ☐ pneumonia; ☐ ventilator;

Bowel Ischemia ☐ no; ☐ treated conservatively; ☐ return to OR;

Bleeding ☐ no; ☐ yes

ICU Stay ____ days

Dysrhythmia (new) ☐ no; ☐ yes;

Change of Renal Function ☐ creat. Increase > 0.5 mg/dl (44.2 µmol/L) ☐ temp. dialysis; ☐ permanent dialysis; ☐ none

Wound Complication ☐ no; ☐ superficial separation/infection ☐ return to OR;

Discharge Medications

ASA ☐ no; ☐ yes ☐ intolerant;

Plavix ☐ no; ☐ yes ☐ intolerant;

Statin ☐ no; ☐ yes ☐ intolerant;

Beta Blocker ☐ no; ☐ yes ☐ intolerant;

Peri-Op Antibiotic Ordered?

Start <1 hr Pre-op ☐ no; ☐ yes ☐ no, for medical reason;

1st-2nd Gen Cephalosporin ☐ no; ☐ yes ☐ no, for medical reason;

Stop >24hr Post-op ☐ no; ☐ yes ☐ no, for medical reason

Open AAA Repair- Follow-up

Last Name:		First Name:		DOB:	
MRN:		SSN:		Zip/Postal Code:	
Visit Code:		Surgeon:		Surgery Date:	
				Side:	

General Information

Date of Contact

Contact By ☐ Office visit; ☐ Refuse follow-up visit; ☐ Phone; ☐ Lost to follow-up;

Current Smoking ☐ No; ☐ Yes (within last 6 months);

Current Living Status ☐ Home; ☐ Nursing home; ☐ Dead;

Date of Death

Cause ☐ Operation Related; ☐ Non-Related; ☐ Unsure;

Current Medications

ASA ☐ No; ☐ Yes; ☐ Intolerar

Plavix ☐ No; ☐ Yes; ☐ Intolerar

Coumadin ☐ No; ☐ Yes; ☐ Intolerar

Beta Blocker ☐ No; ☐ Yes; ☐ Intolerar

Statin ☐ No; ☐ Yes; ☐ Intolerar

Number of subsequent operations related to AAA

Performed for:

Incision ☐ No; ☐ Yes;

Graft ☐ No; ☐ Yes;

Intestine ☐ No; ☐ Yes;

Leg Ischemia ☐ No; ☐ Yes;

v 1.9

OPEN INFRARENAL AAA DEFINITIONS – v.01.09

If more than one response applies, select the most severe (highest number) response for each data field.

Pre-op

Smoking: Prior = quit ≥ 1 year ago. Current = still smoking within last 12 months. Include cigarettes, pipe, or cigar.

HTN (Hypertension): Defined as ≥ 140/90, either systolic or diastolic, at admission or within last 6 months, or clearly documented in medical record.

Beta-blockers: Peri-operative = started within one month before surgery or during surgery. Chronic = more than one month before surgery.

CAD Symptoms (Coronary artery disease**):** Stable angina = stable pattern or symptoms with or without anti-anginal medication. Unstable angina = new onset, increasing frequency, lasting > 20 min and/or rest angina.

CABG/PTCA: Coronary artery bypass, angioplasty, or stent.

CHF (Congestive Heart Failure): Documented CHF: Mild = SOB on exertion; Severe = SOB at rest, pulmonary edema, or pitting ankle edema. (Use 2 = mild if severity not documented.)

COPD: Not treated = COPD documented in record but not treated with medication. Meds include theophylline, aminophylline, inhalers or steroids

Dialysis: Transplant = patient has functioning kidney transplant; Dialysis = currently on hemo- or peritoneal dialysis.

Creatinine: Last available measurement taken before procedure. If multiple measurements, use highest within 30 days of surgery.

Stress Test: Includes stress EKG, stress echo, nuclear stress scans, within 2 years of surgery.

Pre-admin living: Use last living status before any current, acute hospitalization or rehab unit.

Previous Arterial:

Bypass - Any non-cardiac arterial bypass for occlusive disease
CEA - Carotid endarterectomy
Aneurysm Repair – Any known true arterial aneurysm repair (excluding cerebral or pseudo-aneurysm)
PTA/Stent – Of any non-cardiac artery
Major Amputation – Any amputation above the foot or hand

Pre-Op Medications: Taken within 36 hours of surgery. Statins include any HMG-CoA reductase inhibitor, such as Lipitor, Mevacor, Pravachol, Zocor, Lescol, etc. If Plavix is discontinued prior to surgery it should be coded = 0.

Pre-op Hemoglobin: Most recent pre-op hemoglobin within past 30 days.

Family history of AAA: First-degree relative (parents, sibling, aunt, uncle, child)

Prior Aortic Surgery: AAA = infrarenal aneurysm repair. SAAA = Suprarenal aneurysm repair. Bypass = A-1 or A-F for occlusive disease. Other = endarterectomy or other.

Ejection Fraction: Left ventricular ejection fraction (%), by Echo, nuclear scan, or cath estimate, within 6 months

Maximum AP AAA diameter: Largest AP diameter. If AP not specified, use largest diameter. If multiple imaging modalities, use most accurate in following hierarchy: CT>MRI>Echo>arteriogram.

Iliac aneurysm: Iliac diameter > 1.5 cm. Maximum diameter of largest iliac artery, common, or internal.

Procedure

Urgency: Symptomatic = surgery within 24 hours of pain and/or tenderness without rupture. Ruptured = diagnosis at operation.

Conversion from endovascular: Early = within 30 days, late = >30 days

Renal/visceral ishcemic time: Include any aortic re-clamp time for hypotension.

Exposure: Anterior = transperitoneal

Distal anastomosis: Most distal extent of either right or left limb if bifurcated.

Graft Diameter: Body size = diameter of most proximal portion of graft.

Total procedure time: From incision to closure.

Concomitant Procedure

Thromboembolectomy: For inadequate limb perfusion after initial completion of distal anastomosis via Fogarty or extension of graft (bypass).

Ruptured AAA Repairs Only

Lowest pre-intubation BP: After arrival at hospital (lowest prior to intubation). Use systolic pressure.

Mental status: Normal alert and oriented; Disoriented to person, place, or time.

Delayed closure: Fascia not closed at initial operation to avoid compartment syndrome.

Post-op Data

Time to extubation: In OR; otherwise, beginning upon departure from OR

Vasopressor Required Post-Op: Dopamine≥5mcg/kg/min, or neosynepherine, levophed, epinepherine, vasopressin, or other IV vasopressor during hospitalization.

ICU stay: Any portion of 24 hours = 1 day.

Transfusion: Total of all PRBC transfusions pre-op, intra-op, and post-op during this hospitalization.

Myocardial Infarction: Troponin: by local standards for MI. EKG: new Q waves, new ST and T wave changes. Clinical: documentation of MI by clinical criteria or ECHO or other imaging modality.

Dysrhythmia: New rhythm disturbance requiring treatment with medications or cardioversion.

CHF: Pulmonary edema with requirement for monitoring or treatment in ICU.

Respiratory: Pneumonia = Lobar infiltrate on CXR and pure growth of recognized pathogen or 4+ growth of recognized pathogen in presence of mixed growth. Ventilator = required after initially extubated (if applicable).

Change renal function: New increase in creatinine of 0.5mg/dl. New dialysis includes peritoneal dialysis, hemodialysis, and hemo-filtration. (Applies to dialysis only if not required pre-op.)

Leg ischemia/emboli: Loss of previously palpable pulses, loss of previously present Doppler signals, decrease of >0.15 in ABI, or blue toe.

Bowel ischemia: Diagnosed by colonoscopic evidence of ischemia, bloody stools in a patient who dies prior to colonoscopy or laparotomy, or presumptive diagnosis with conservative treatment.

Peri-operative Antibiotics: Use 0=no if antibiotic was not ordered. To use 1=yes, antibiotic must be ordered to be given within 1 hour prior to skin incision and must be ordered to be discontinued within 24 hrs of end of time of operation. To use 2=no for medical reason, a medical reason must be documented in the chart that antibiotic not given. **Acceptable antibiotics include:** Ampicilin/sulbactam, Aztreonam, Cefazolin, Cefmetazole, Cefotetan, Cefuroxime, Ciprofloxacin, Clindamycin, Ertapenem, Erythromycin base, Gatifloxacin, Gentamicin, Levofloxacin, Metronidazole, Moxifloxacin, Neomycin, and Vancomycin.

1st-2nd Generation Cepahalosporin: (Cefazolin or Cefuroxime) Use response 1=yes, if ordered. If documented in medical record that not ordered for medical reason use 2. Otherwise use 0=no.

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) 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:** Public reporting, Internal quality improvement Accountability, Payment incentive, Accreditation	**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	**1b** C☐ P☐

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 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

M☐
N☐

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

1c
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N☐

the internal or common carotid artery--results of the North American ACAS Study]. Zentralbl Chir. 1996;121:1033-5.
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?	**1**

Rationale:	**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 21 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-specs C☐ P☐ M☐ N☐**
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.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:
-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***)**
Registry data

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/Agency **2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)* Ambulatory Care: Office, Hospital, Ambulatory Care: Clinic, Ambulatory Care: Hospital Outpatient **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)*: **2b.2 Analytic Method** *(type of reliability & rationale, method for testing)*: **2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:	**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.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:	**2d** C☐ P☐ M☐ N☐ NA ☐

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 Ratin

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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 same target population), Describe why it is a more valid or efficient way to measure quality:**	**3c** C☐ P☐ M☐ N☐ NA ☐
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?	**3**

Rationale:	**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 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.	**4d** **C☐ P☐ M☐ N☐**
4e. Data Collection Strategy/Implementation	**4e**

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:**	**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/disclaimers:

Ad.11 -13 Additional Information web page URL or attachment: Attachment CAREmeasureTesting.docx

Date of Submission (*MM/DD/YY*)**:** 03/28/2011

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

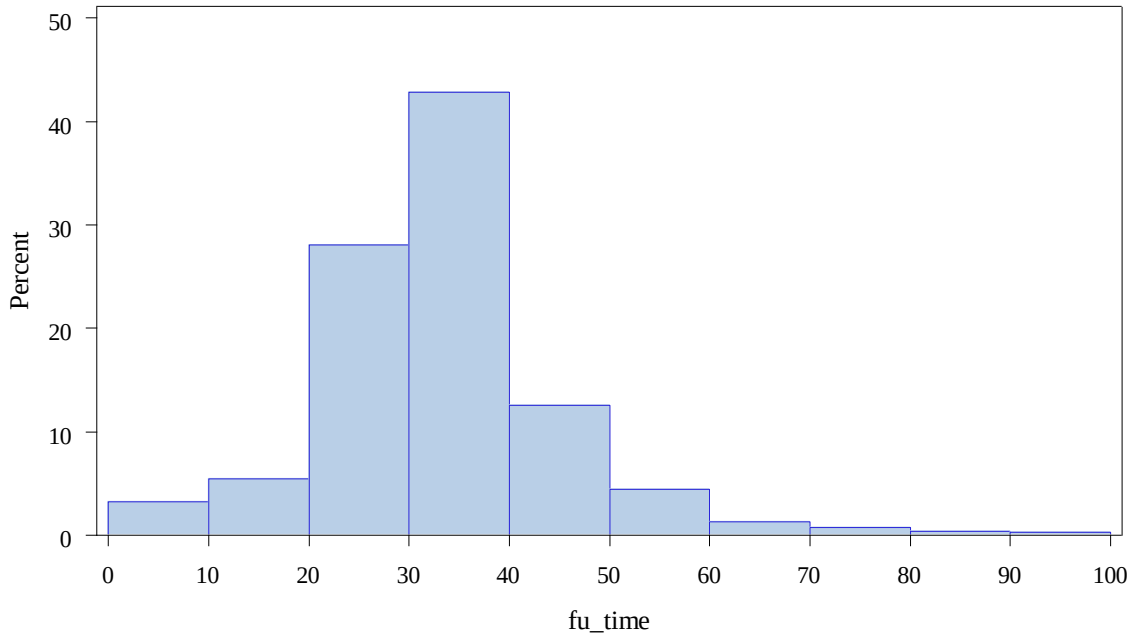
The FREQ Procedure

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

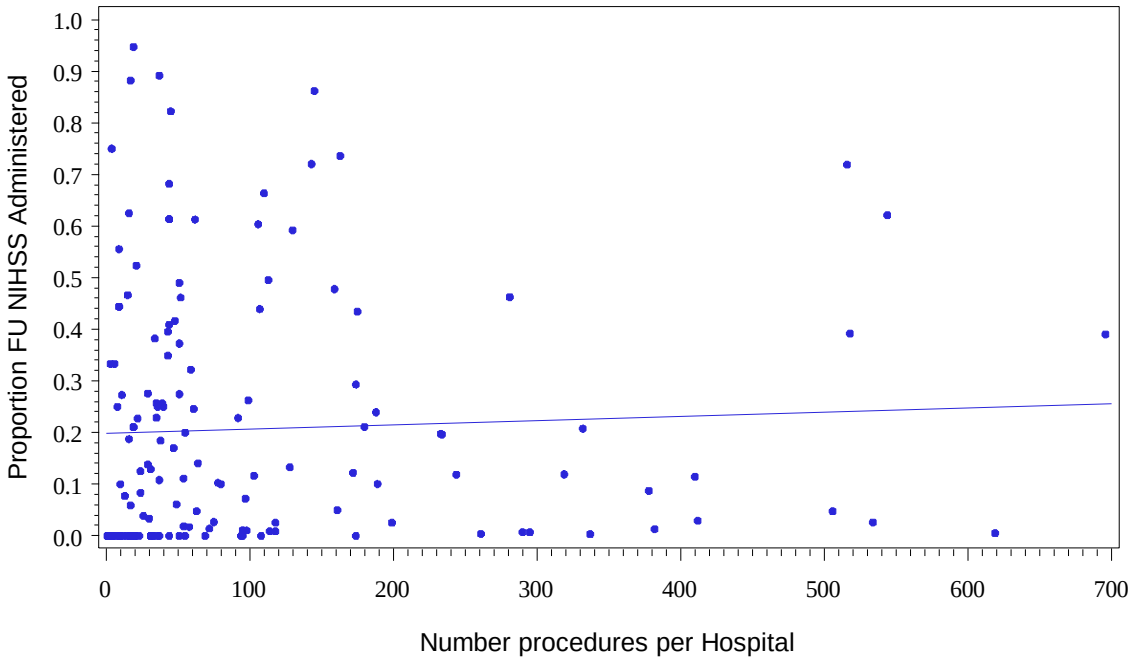
Table of Procedure Type by nihss scale			
Procedure Type	**fu_nihss(21-60 day Certified NIHSS Administered)**		
Frequency Row Pct	**(0) No**	**(1) Yes**	**Total**
(1)CAS	5490 63.00	3224 37.00	8714
(2)CEA	6705 99.05	64 0.95	6769
Total	12195	3288	15483

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

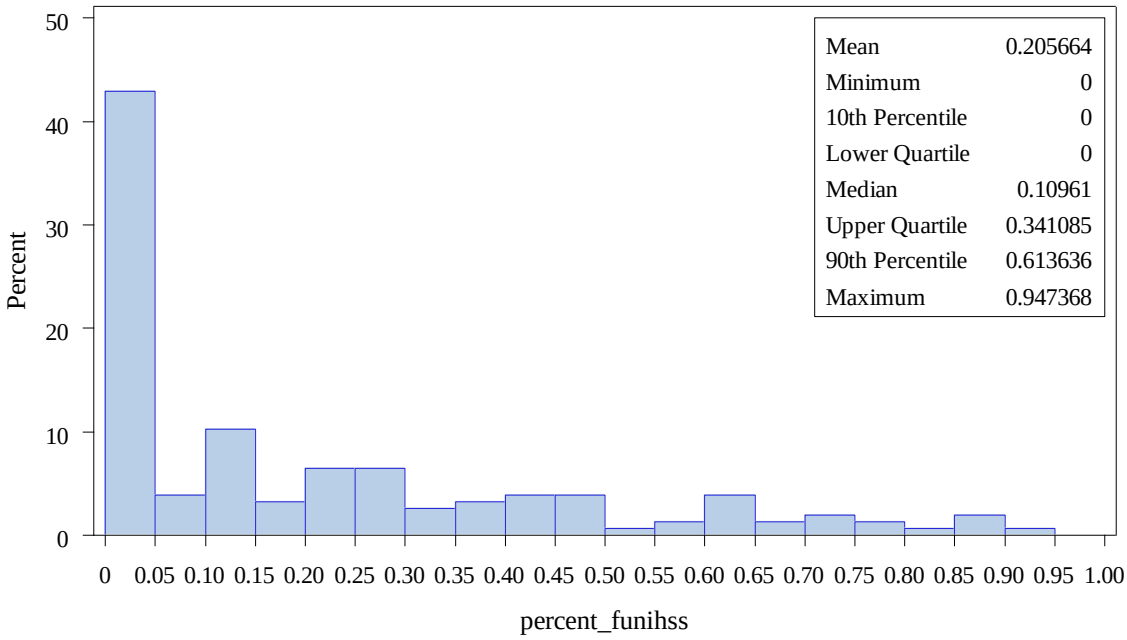
Days post-procedure for Assessment



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.					

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 #:** 1534 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** In-hospital mortality following elective EVAR of small AAAs
De.2 **Brief description of measure:** Percentage of patients undergoing elective endovascular repair of small asymptomatic abdominal aortic aneurysms (AAA) who die while in hospital. This measure is proposed for both hospitals and individual providers.
1.1-2 **Type of Measure:** Outcome De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Submitted SVS measure: In-hospital mortality following elective open repair of small AAAs
De.4 **National Priority Partners Priority Area:** Population health, Safety, Overuse De.5 **IOM Quality Domain**: Effectiveness, Efficiency, Safety De.6 **Consumer Care Need:** Staying healthy

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:** Agreement With Measure Stewards_Agreement Between_National Quality Forum (12-6-2010).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:** Public reporting, Internal quality improvement Accountability, Payment incentive	**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, Patient/societal consequences of poor quality 1a.2 1a.3 **Summary of Evidence of High Impact:** An international population-based study found that an aneurysm was present in 8.9% of men and 2.2% women (p < 0.001).(1) In the United States, ruptured AAAs are the 15th leading casue of death overall and the 10th leading casue of death in males over 55 years, a rate than has held steady for the past 2 decades. (2) Ruptured aneurysms are fatal in about 80% of cases. (3) 1a.4 **Citations for Evidence of High Impact:** (1) Singh K et al. Am. J. Epidemiol. (2001) 154 (3): 236-244. (2) Fillinger M. (2010) Abdominal Aortic Aneurysms: Evaluation and Decision Making. In J. Cronenewett & KW. Johnston (Eds.), Rutherford´s Vascular Surgery (1928-1948) Saunders Elsevier. Philadelphia. (3) May J, White GH, Stephen MS, Harris JP. J Vasc Surg. 2004 Nov;40(5):860-6.	**1a** C☐ P☐ M☐ N☐
1b. Opportunity for Improvement 1b.1 **Benefits (improvements in quality) envisioned by use of this measure:** Elective AAA repair is offered to prolong life by avoiding AAA rupture, which is fatal in more than 85% of cases. Rupture risk is primarily	**1b** C☐ P☐ M☐

assess by AAA diameter, with larger AAAs more prone to rupture. Surgical treatment carries risk, however, of mortality and morbidity, which must be balanced against the risk of rupture in order to determine which patients will benefit from elective repair.

Based on the UK small aneurysm trial, the accepted diameter threshold for elective AAA repair is 5.5 cm, although women have a slightly higher risk than men, so a threshold of 5 cm is usually recommended for women. The key concept of this proposed measure is that patients who are at low risk for AAA rupture (<6cm dia in men and <5.5 cm dia in women) should ONLY be offered elective AAA repair if their predicted operative mortality is low. This concept avoids the need for risk adjustment, since this is implicit in the decision to offer elective repair of small AAAs. This measure will highlight variation in proper patient selection by reporting unadjusted mortality rates for surgery in patients with small AAAs in whom this rate should be universally low. Providers or hospitals with high mortality rates are either not performing safe surgery or are not properly selecting low risk patients. The measure specifically excludes patients with larger AAAs because risk adjustment would be needed for such cases, and accepted risk adjustment algorithms are not available.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
There is significant regional variation in rates of AAA repair, indicating a performance gap. In 27 hospital referral regions, rates of AAA repair were at least 30% higher than the United States average of 1.0 per 1,000 Medicare enrollees. In 44 hospital referral regions, rates were more than 25% lower than the national average.(1)

Where these data have been monitored and reported to providers in VSGNE since 2003, among 11 centers and 48 providers treating 1380 patients since 2003, the median mortality rate for men and women with small AAAs as defined above is 0%, but the range is 0-6%, indicating both a perfomance gap and opportunity for further improvement.

1b.3 Citations for data on performance gap:
(1)Dartmouth-CMS-FDA Collaborative, "Trends and Regional Variation in Abdominal Aortic Aneurysm Repair, February 1, 2006.

1b.4 Summary of Data on disparities by population group:
Such data will become available if this measure is adopted for reporting and used by more centers with more varied population demographics than found in the New England region.

1b.5 Citations for data on Disparities:
not available

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*)**:** discussed above

1c.2-3. Type of Evidence: Cohort study, Expert opinion, Meta-analysis

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
The endpoint of inhospital mortality is the accepted primary endpoint for both elective AAA repair. Variation in outcome has been established in randomized trials,cohort studies and meta analyses. This outcome measure has face validity among all providers of this service. Studies cited above have shown substantial variation in outcomes by provider when elective AAA repair is performed in patients with small AAAs.

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):**
Motality is the reporting standard recommended by the Society for Vascular Surgery, and has been used in multiple trials.

N☐

1c
C☐
P☐
M☐
N☐

1c.6 Method for rating evidence: Expert opinion. **1c.7 Summary of Controversy/Contradictory Evidence:** None **1c.8 Citations for Evidence (*other than guidelines*):** (2) Fillinger M. (2010) Abdominal Aortic Aneurysms: Evaluation and Decision Making. In J. Cronenewett & KW. Johnston (Eds.), Rutherford´s Vascular Surgery (1928-1948) Saunders Elsevier. Philadelphia. **1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number*):** None **1c.10 Clinical Practice Guideline Citation:** None **1c.11 National Guideline Clearinghouse or other URL:** None **1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*):** N/A **1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF)*: N/A **1c.14 Rationale for using this guideline over others:** Mortality is the accepted endpoint used in all trials. Restricting the AAA risk by confining the analysis to small AAAs is explained above.	
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*): Mortality following elective endovascular AAA repair of asymptomatic AAAs in men with < 6 cm dia and women with < 5.5 cm dia AAAs **2a.2 Numerator Time Window (*The time period in which cases are eligible for inclusion in the numerator*):** Lifetime for provider reporting, annual for hospital reporting **2a.3 Numerator Details (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*):** A registry that includes hospitalization details, AAA diameter and discharge status is required to identify patients for numerator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who died in hospital following endovascular infrarenal AAA repair (EVAR) if their asymptomatic aneurysm was repaired electively and was asymptomatic and small (< 6cm dia in men, <5.5 cm dia in women, judged by	**2a-specs** **C☐** **P☐** **M☐** **N☐**

preoperative imaging(CT, MR or ultrasound)).

2a.4 **Denominator Statement (***Brief, text description of the denominator - target population being measured***):**
All elective endovascular repairs of asymptomatic AAAs in men with < 6 cm dia and women with < 5.5 cm dia AAAs

2a.5 **Target population gender:** Female, Male
2a.6 **Target population age range:** 18 years or older

2a.7 **Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
Lifetime for provider reporting, annual for hospital reporting

2a.8 **Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
A registry that includes hospitalization details, AAA diameter and discharge status is required to identify patients for denominator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who underwent endovascular AAA repair are included if their aneurysm was asymptomatic and small (< 6cm dia in men, <5.5 cm dia in women, judged by preoperative imaging).

2a.9 **Denominator Exclusions (***Brief text description of exclusions from the target population***):** > 6 cm diameter - men
> 5.5 cm diameter – women
Symptomatic AAAs that required urgent/emergent (non-elective) repair

2a.10 **Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Patients undergoing non-elective open repair of symptomatic AAAs or those with AAAs larger than the diameters noted above.

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

2a.12-13 **Risk Adjustment Type:** No risk adjustment necessary

2a.14 **Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
See "Scientific Acceptablility" section for rationale

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 = Lower score
2a.21 **Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Identify denominator, exclude non-elective repair of symptomatic or ruptured patients and men with AAA >6 cm, and women with AAA >5.5, find number of deaths
Outcome = deaths/ # cases

2a.22 **Describe the method for discriminating performance** *(e.g., significance testing)***:**
Standard statistical comparison of rates to provide confidence levels to discriminate meaningful differences from the mean.

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)*
Registry data

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.***):**
Society for Vascular Surgery Vascular Quality Initiative Registry
Vascular Study Group of New England Registry

2a.26-28 Data source/data collection instrument reference web page URL or attachment: Attachment Endo_AAA_Repair_v1.9.xls

2a.29-31 Data dictionary/code table web page URL or attachment: Attachment EVAR defs v.01.09.doc

2a.32-35 Level of Measurement/Analysis (*Check the level(s) for which the measure is specified and tested)*
Clinicians: Individual, Clinicians: Group, Facility/Agency, Can be measured at all levels

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Hospital

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

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)***:** A random sample of 100 patient records representing 5 procedures relevant to the measure from 5 different hospitals based on data collected during the past 2 years. In addition, in-hospital mortality was examined by claims based analysis of 7,205 patients discharged and recorded in the VSGNE registry between 2003 to 2007.

2b.2 Analytic Method *(type of reliability & rationale, method for testing)***:**
A nurse abstractor completed a form based on medical record review for the variables relevant to this measure. The results of this chart review were then compared with the original registry data. The Kappa statistic was used to judge reliability of the data. For mortality validation, claims data from each of 12 hospitals were matched to patient identified data within the VSGNE registry to compare discharge status (alive vs. dead). Any discrepencies were then further evaluated based on a medical record audit.

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
The key variables for this measure and testing results were:

1. Correct procedure (endovascular infrarenal AAA repair) performed. Kappa =1.0
2. AAA diameter: Based on 60 measurement, the mean diameter was 56.7 mm in the registry, 56.6 mm in the chart audit, no significant difference. Further, in on cases was the category of size based on the cut points of 6 cm in men and 5.5 cm in women different, Kappa = 1.0 for these categories.
3. Hospital mortality: Kappa = .91 (SE .01)
4. Elective(vs urgent or emergent); Kappa=1.0

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 Data/sample *(description of data/sample and size)***:** See reliability testing

2c.2 Analytic Method *(type of validity & rationale, method for testing)***:**
comparison of rates with published literature

2c.3 Testing Results *(statistical results, assessment of adequacy in the context of norms for the test conducted)***:**
In VSGNE, in hospital mortality for EVAR is 2-5%, and shows appropriate variation among hospitals, using this measure. This corresponds well to the published literature for elective AAA repair.

2c C☐ P☐ M☐ N☐

2d. Exclusions Justified — **2d**

2d.1 Summary of Evidence supporting exclusion(s):
Large clinical trials have demonstrated the relative safety of observation AAAs with a minimum diameter of less than 5.5 cm.(1)

2d.2 Citations for Evidence:
(1) Fillinger M. (2010) Abdominal Aortic Aneurysms: Evaluation and Decision Making. In J. Cronenewett & KW. Johnston (Eds.), Rutherford´s Vascular Surgery (1928-1948) Saunders Elsevier. Philadelphia.

2d.3 Data/sample *(description of data/sample and size)*: 1380 patients undergoing elective EVAR in VSGNE, all patients, 2003-2010. 1120 men, 260 women

2d.4 Analytic Method *(type analysis & rationale)*:
rate calculation based on AAA dia size

2d.5 Testing Results *(e.g., frequency, variability, sensitivity analyses)*:
Men, < 6cm AAA, mdn 0% mortality, range 0-0.5% among 12 centers
Men, >= 6 cm dia, mdn 0% mortality, range 0-0.5% among 12 centers

Women, < 5.5 cm dia AAAs, mdn mortality 0%, range 0-5.3% among 11 centers
Women, >= 5.5 cm dia AAAs, mdn mortality 0.9%, range 0-9.4% among 11 centers

C☐ P☐ M☐ N☐ NA☐

2e. Risk Adjustment for Outcomes/ Resource Use Measures

2e.1 Data/sample *(description of data/sample and size)*: This measure was designed to avoid the need for risk adjustment, because risk adjustment is complex for AAA repair, and accepted algorithms do not yet exist. In patients with small AAAs, with low rupture risk, it is incumbent on the surgeon to factor in the risk-benefit of elective, prophylactic repair, since a high operative mortality will eliminate any benefit of AAA repair. Women have higher rupture risk than men, so by focusing this measure on AAAs < 5.5 cm in women and < 6 cm in men, the non-risk-adjusted mortality is a fair comparison of surgical outcome in the opinion of the sponsor, the Society for Vascular Surgery, and it represents a very important outcome to measure

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)*: see section 1.b.3 and above 2,d,5

2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance *(type of analysis & rationale)*:
Standard statistial analysis to determine 95% confidence interval for hospitals and providers to determine practical difference from mean

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)*:

2f
C☐ P☐ M☐ N☐

2g. Comparability of Multiple Data Sources/Methods

2g.1 Data/sample *(description of data/sample and size)*: no other data sources available

2g
C☐ P☐ M☐

2g.2 Analytic Method *(type of analysis & rationale)*: N/A **2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*: N/A	N☐ NA☐
2h. Disparities in Care **2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: N/A **2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:** N/A	**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*): Data from SVS VQI and VSGNE are reported to each hospital and provider in a format that can be transmitted to an appropriate public reporting mechanism. **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***):** Vascular Study Group of New England www.vsgne.org Data have been successfully collected in this quality registry since 2003, and reports provided to participating physicians and hospitals about their rates of outcomes. These results are used by the regional quality group to provide benchmark reporting, and to stimulate regional quality improvement projects. **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)*: VSGNE samples previously described **3a.5 Methods** *(e.g., focus group, survey, QI project)*: Semi-annual meetings of providers in VSGNE **3a.6 Results** *(qualitative and/or quantitative results and conclusions)*: Benchamrk reports of this outcome measure have been provided to VSGNE member physician and hospitals since 2003, and discussed at semi-annual meetings. There have been no questions about interpretability.	**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 same target population), Describe why it is a more valid or efficient way to measure quality:**	**3c** C☐ P☐ M☐ N☐ NA☐
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.** Small size measurements of AAA should not significantly impact the measure, and symptom status is easily validated during chart review. We have not found inaccuracy in this measure.	**4d** C☐ P☐ M☐ N☐

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:
In the VSGNE experience which has been tracking hosptital mortality as a major endpoint since 2003, we have not experienced any difficulty with obtaining data related to this endpoint. Our percent missing for this variable has been less than 1%.

4e.2 Costs to implement the measure (*costs of data collection, fees associated with proprietary measures*)**:**
In the context of the VSGNE and SVS VQI registries, there is no additional cost as all of these data are already collected.

4e.3 Evidence for costs:
N/A

4e.4 Business case documentation: N/A

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
Society for Vascular Surgery, 633 N. St. Clair, 22nd Floor, Chicago, Illinois, 60611

Co.2 Point of Contact
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-

Measure Developer If different from Measure Steward
Co.3 Organization
Society for Vascular Surgery, 633 N. St. Clair, 22nd Floor, Chicago, Illinois, 60611

Co.4 Point of Contact
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-

Co.5 Submitter If different from Measure Steward POC
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-, Society for Vascular Surgery

Co.6 Additional organizations that sponsored/participated in measure development

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. N/A
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:** 2010 **Ad.7 Month and Year of most recent revision:** 12, 2010 **Ad.8 What is your frequency for review/update of this measure?** **Ad.9 When is the next scheduled review/update for this measure?**
Ad.10 Copyright statement/disclaimers: N/A
Ad.11 -13 Additional Information web page URL or attachment:
Date of Submission (*MM/DD/YY*)**:** 03/27/2011

Vascular Quality Initiative - Endo AAA Repair

Last Name | First Name | Middle Initial

Date of Birth | Medical Record Number | Social Security Number

General Information

Patient Data

Zip/Postal Code

Ethnicicty: ☐ Not Hispanic or Latino; ☐ Hispanic or Latino

Height: ☐ inches or cm

Weight: ☐ lbs or kg

Gender: ☐ male; ☐ female

Race: ☐ White; ☐ Black or African American; ☐ Asian; ☐ More than 1 race; ☐ American Indian or Alaskan Native; ☐ Native Hawaiian or other Pacific Islander; ☐ Unknown/other

Admission Data

Visit code (not required)

Admit Date

Surgeon

Discharge Status: ☐ home; ☐ rehab unit; ☐ nursing home; ☐ dead; ☐ other hospital; ☐ skilled nursing facility

If dead, date of death

Tranfered from?: ☐ no; ☐ hospital; ☐ rehab unit

Discharge Date

Surgery Date

Does the patient have Medicare Part B?: ☐ no; ☐ yes

Demographics

Smoking: ☐ never; ☐ prior (>1 yr); ☐ current (within yr)

Diabetes: ☐ none; ☐ diet; ☐ oral meds; ☐ insulin

CAD symptoms: ☐ none; ☐ hx MI but no sx; ☐ stable angina; ☐ unstable angina or MI < 6 mos

CHF: ☐ none; ☐ asymp, hx CHF; ☐ mild; ☐ severe

Dialysis: ☐ no; ☐ functioning transplant; ☐ on dialysis

Stress Test: ☐ normal; ☐ (+) ischemia; ☐ (+) MI; ☐ (+)both; ☐ not done

ASA Class: ☐ 1 normal/healthy; ☐ 2 w/mild systemic dx; ☐ 3 w/severe systemic dx; ☐ 4 w/severe systemic dx that is a constant threat to life; ☐ 5 moribund, not expectd to survive w/o op

Hypertension: ☐ no; ☐ yes (>=140/90 or history)

Beta blockers: ☐ no; ☐ op day only; ☐ pre-op 1-30 days; ☐ chronic >30 days; ☐ no-intolerant

CABG/PTCA: ☐ none; ☐ <5yr; ☐ >=5yrs ago

COPD: ☐ no; ☐ not treated; ☐ on meds; ☐ on home oxygen

Creatinine: ☐ mg/dl OR µmol/L

Pre-adm Living: ☐ home; ☐ nursing home

Pre-op Hemoglobin: ☐ g/dl OR g/L

Previous arterial

Bypass: ☐ no; ☐ yes

Aneurysm Repair: ☐ no; ☐ yes

Major Amp: ☐ no; ☐ yes

CEA: ☐ no; ☐ yes

PTA/Stent: ☐ no; ☐ yes

Pre-Op Medications

ASA: ☐ no; ☐ yes; ☐ intolerant

Statin: ☐ no; ☐ yes; ☐ intolerant

Plavix: ☐ no; ☐ yes; ☐ intolerant

History

Family History of AAA: ☐ no; ☐ yes

Ejection Fraction: ☐ <30%; ☐ 30-50%; ☐ >50%; ☐ not done; ☐ unknown

Iliac Aneurysm: ☐ no; ☐ unilateral; ☐ bilateral

Urgency: ☐ elective; ☐ symptomatic; ☐ ruptured

Prior Aortic Surgery: ☐ none; ☐ AAA; ☐ SAAA; ☐ bypass; ☐ other

Maximum AP AAA Diam: ☐ mm

Maximum Diameter: ☐ mm

Fill out the fields below if Urgency equals ruptured.

Lowest pre-intubation BP: ☐ Systolic- mmHg

Cardiac Arrest: ☐ no; ☐ yes

Time: Admission to Incision: ☐ hours

Mental Status: ☐ normal; ☐ disoriented; ☐ unconscious

Time: Symptoms to Incision: ☐ hours

Abdomen Explored: ☐ no; ☐ yes

Procedure

Unfit for Open AAA Repair: ☐ no; ☐ yes

Graft Type: ☐ AneurRx; ☐ Excluder; ☐ Talent; ☐ Zenith; ☐ Powerlink; ☐ Endurant; ☐ Aorfix; ☐ Unifit; ☐ Zenith Low Profile; ☐ Aptus; ☐ Other;

Unfit for gen. anesthesia: ☐ no; ☐ yes

Graft Configuration: ☐ aorto-bi-iliac; ☐ aorto-uni-iliac right; ☐ aorto-uni-iliac left; ☐ aorto-aortic

Anesthesia: ☐ local; ☐ regional; ☐ general

Total Procedure Time: ☐ minutes

Depends on Graft Configuration:

Graft Body Diameter: ☐ mm

Right Limb Diameter: ☐ mm

Depends on Graft Configuration:

Left Limb Diameter: ☐ mm

Hypogastric Intentionally Covered: ☐ none; ☐ unilateral; ☐ bilateral

Hypogastric Unintentionally Covered: ☐ none; ☐ unilateral; ☐ bilateral

Skin Prep: ☐ chlorhexadine; ☐ alcohol; ☐ iodine; ☐ chlor+iodine; ☐ chlor+alcohol; ☐ iodine+alcohol; ☐ all 3

Arterial Injury: ☐ no; ☐ femoral; ☐ iliac; ☐ renal; ☐ aorta; ☐ multiple

If Arterial Injury: Intervention: ☐ none; ☐ stent/PTA; ☐ stent-graft; ☐ open repair

Endoleak at Completion: ☐ no; ☐ attachment site(type I); ☐ branch(type II); ☐ mid graft(type III); ☐ indeterminate

Conversion to Open: ☐ no; ☐ yes;

If yes, Reason (If yes, also complete an Open AAA Form): ☐ unable to deploy appropriately; ☐ endoleak; ☐ rupture

Iodinated Contrast: ☐ ml

EBL: ☐ ml

Crystalloid: ☐ ml

PRBC (in OR): ☐ units (during the procedure)

Heart Rate

On Arrival in OR: ☐ bpm

Highest intra-op: ☐ bpm

Procedure (continued)

Concomitant Procedure

Hypogastric Coil Pre-Op	☐ no; ☐ unilateral; ☐ bilateral	Hypogastric Coil Intra-Op	☐ no; ☐ unilateral; ☐ bilateral	Unplanned Graft Extension	☐ no; ☐ yes
Femoral Endarterectomy	☐ no; ☐ yes	Fem-Fem Bypass	☐ no; ☐ yes	Ilio-Femoral Bypass	☐ no; ☐ yes
Thromboembolectomy	☐ no; ☐ yes	Iliac Angioplasty	☐ no; ☐ yes	Iliac Stent Placement	☐ no; ☐ yes
Renal PTA/Stent	☐ no; ☐ yes	Other Arterial Reconstruction	☐ no; ☐ planned; ☐ arterial injury		

Post-Op Data

Time to Extubation	☐ in OR; ☐ <12 hrs; ☐ 12-24 hrs; ☐ >=24 hrs	Vasopressors Req. Post-Op	☐ no; ☐ yes	ICU Stay	☐ days
Myocardial Infarction	☐ no; ☐ troponin only; ☐ EKG or clinical	Dysrhythmia (new)	☐ no; ☐ yes	CHF	☐ no; ☐ yes
Respiratory	☐ no; ☐ pneumonia; ☐ ventilator	Change of Renal Function	☐ none; ☐ creat. increase > 0.5 mg/dl (44.2 µmol/L); ☐ temp. dialysis; ☐ permanent dialysis	Leg Ischemia/Emboli	☐ no; ☐ yes, rx w/o surgery; ☐ required surgery; ☐ amputation
Bowel Ischemia	☐ no; ☐ treated conservatively; ☐ return to OR	Wound Complication	☐ no; ☐ superficial separation/infection; ☐ return to OR	Transfusion # Units PRBC	☐ # of units
Return to OR	☐ no ☐ yes	If yes, Bleeding	☐ no; ☐ yes		
Stroke	☐ none; ☐ minor; ☐ major ☐				

Discharge Medications

ASA	☐ no; ☐ yes; ☐ intolerant ☐	Statin	☐ no; ☐ yes; ☐ intolerant ☐
Plavix	☐ no; ☐ yes; ☐ intolerant ☐	Beta Blocker	☐ no; ☐ yes; ☐ intolerant ☐

Peri-Op Antibiotic Ordered

Start <1hr Pre-op	☐ no; ☐ yes; ☐ no, for medical reason	Stop <24hr Post-op	☐ no; ☐ yes; ☐ no, for medical reason
1st-2nd Gen Cephalosporin	☐ no; ☐ yes; ☐ no, for medical reason		

Vascular Quality Initiative - Endo AAA Repair Follow-Up

Last Name:		First Name:		DOB:	
MRN:		SSN:		Zip/Postal Code:	
Visit Code:		Surgeon:		Surgery Date:	
				Side:	

General Information

Date of Contact

Contact By ☐ Office Visit ☐ Phone; ☐ Refused follow-up visit; ☐ Lost to follow-up

Current Smoking ☐ No; ☐ Yes (within last 6 months)

Current Living Status ☐ Home; ☐ Nursing Home; ☐ Dead

Date of Death

Cause ☐ Operation Related; ☐ Non-Related; ☐ Unsure

Current Medications

ASA ☐ No; ☐ Yes; ☐ Intolerant	Plavix ☐ No; ☐ Yes; ☐ Intolerant	Coumadin ☐ No; ☐ Yes; ☐ Intolerant	
Beta Blocker ☐ No; ☐ Yes; ☐ Intolerant	Statin ☐ No; ☐ Yes; ☐ Intolerant		

Endo AAA Repair

Current Max AAA Diameter mm

Number New Interventions

Current Endoleak ☐ No; ☐ Attachment site(type I); ☐ Branch(type II); ☐ Mid graft(type III); ☐ Indeterminate

Conversion to Open Repair ☐ No; ☐ Yes;

If yes, Date

Performed for:

Endoleak ☐ No; ☐ Yes;	Sac Growth ☐ No; ☐ Yes	Migration ☐ No; ☐ Yes;
Infection ☐ No; ☐ Yes;	Symptom Rupture ☐ No; ☐ Yes	
Other Op Related to Endo ☐ No; ☐ Yes;		

ENDOVASCULAR AAA DEFINITIONS– v.01.09

If more than one response applies, select the most severe (highest number) response for each data field.

Pre-op Data

Smoking: Prior = quit ≥ 1 year ago. Current = still smoking within last 12 months. Include cigarettes, pipe, or cigar.

HTN (Hypertension): Defined as ≥ 140/90, either systolic or diastolic, at admission or within last 6 months, or clearly documented in medical record.

Beta-blockers: Peri-operative = started within one month before surgery or during surgery. Chronic = more than one month before surgery.

CAD Symptoms (Coronary artery disease**):** Stable angina = stable pattern or symptoms with or without antianginal medication. Unstable angina = new onset, increasing frequency, lasting > 20 min and/or rest angina.

CABG/PTCA: Coronary artery bypass, angioplasty, or stent.

CHF (Congestive Heart Failure): Documented CHF: Mild = SOB on exertion; Severe = SOB at rest, pulmonary edema, or pitting ankle edema. (Use 2 = mild if severity not documented.)

COPD: Not treated = COPD documented in record but not treated with medication. Meds include theophylline, aminophylline, inhalers or steroids

Dialysis: Transplant = patient has functioning kidney transplant; Dialysis = currently on hemo- or peritoneal dialysis.

Creatinine: Last available measurement taken before procedure. If multiple measurements, use highest within 30 days of surgery.

Stress Test: Includes stress EKG, stress echo, nuclear stress scans, within 2 years of surgery.

Pre-admin living: Use last living status before any current, acute hospitalization or rehab unit.

Previous Arterial:

Bypass - Any non-cardiac arterial bypass for occlusive disease
CEA - Carotid endarterectomy
Aneurysm Repair – Any known true arterial aneurysm repair (excluding cerebral or pseudo-aneurysm)
PTA/Stent – Of any non-cardiac artery
Major Amputation – Any amputation above the foot or hand

Pre-Op Medications: Taken within 36 hours of surgery. Statins include any HMG-CoA reductase inhibitor, such as Lipitor, Mevacor, Pravachol, Zocor, Lescol, etc. If Plavix is discontinued prior to surgery it should be coded = 0.

Pre-op Hemoglobin: Most recent pre-op hemoglobin within past 30 days.

Family history of AAA: First-degree relative (parents, sibling, aunt, uncle, child)

Prior Aortic Surgery: AAA = infrarenal aneurysm repair. SAAA = Suprarenal aneurysm repair. Bypass = A-1 or A-F for occlusive disease. Other = endarterectomy or other.

Ejection Fraction: Left ventricular ejection fraction (%), by Echo, nuclear scan, or cath estimate, within 6 months

Maximum AP AAA diameter: Largest AP diameter. If AP not specified, use largest diameter. If multiple imaging modalities, use most accurate in following hierarchy: CT>MRI>Echo>arteriogram.

Iliac aneurysm: Iliac diameter > 1.5 cm. Use maximum diameter of largest iliac artery, common or internal.

Procedure

Urgency: Symptomatic = surgery within 24 hours of pain and/or tenderness without rupture. Ruptured = CT or angio evidence of rupture.

Unfit for open AAA repair: Endovascular repair performed because patient was considered too high risk by surgeon for open repair, i.e., mandatory endovascular repair.

Unfit for general anesthesia: Local or regional anesthesia used because patient was considered too high risk by surgeon or anesthesiologist for general anesthesia, i.e., mandatory regional/local anesthesia.

Anesthesia: Local includes IV sedation. Regional = epidural or spinal

Graft Diameter: Body size = diameter of most proximal portion of graft. Limb size = diameter of distal most graft or extension.

Hypogastric covered: Intentionally = planned prior to procedure to treat distal aneurysm extent. Unintentionally = inadvertent extension of graft not necessary to treat distal aneurysm extent.

Endoleak: Attachment site [type I] = proximal or distal attachment site leak. Branch [type II] = retrograde filling of sac via lumbars, IMA, or accessory renals. Mid-graft [type III] = filling of sac via leak at component overlap sites or fabric tear.

Conversion to open: If yes, give reason. If yes, use Open AAA form also.

Total procedure time: From incision to closure.

Concomitant Procedure

Arterial Injury: Requiring intervention or resulting in occlusion. Use 5=multiple if > 1 site.

Ruptured AAA Repairs Only

Lowest pre-intubation BP: After arrival at hospital (lowest prior to intubation)

Mental status: Normal alert and oriented; Disoriented to person, place, or time.

Abdomen explored: To evacuate hematoma but not to repair rupture (use OPEN AAA Repair form for conversion to open repair.)

Post-op Data

Time to extubation: In OR; otherwise, beginning upon departure from OR

Vasopressors required post-op: Dopamine≥5mcg/kg/min, or neosynephrine, levophed, epinephrine, vasopressin, or other IV vasopressor during hospitalization.

ICU stay: Any portion of 24 hours = 1 day.

Transfusion: Total of all PRBC transfusions pre-op, intra-op, and post-op during this hospitalization.

Myocardial Infarction: Troponin: by local standards for MI. EKG: new Q waves, new ST and T wave changes. Clinical: documentation of MI by clinical criteria or ECHO or other imaging modality.

Dysrhythmia: New rhythm disturbance requiring treatment with medications or cardioversion.

CHF: Pulmonary edema with requirement for monitoring or treatment in ICU.

Respiratory: Pneumonia = Lobar infiltrate on CXR and pure growth of recognized pathogen or 4+ growth of recognized pathogen in presence of mixed growth. Ventilator = required after initially extubated (if applicable).

Change renal function: New increase in creatinine of 0.5mg/dl. New dialysis includes peritoneal dialysis, hemodialysis, and hemo-filtration. (Applies to dialysis only if not required pre-op.)

Leg ischemia/emboli: Loss of previously palpable pulses, loss of previously present Doppler signals, decrease of >0.15 in ABI, or blue toe.

Bowel ischemia: Diagnosed by colonoscopic evidence of ischemia, bloody stools in a patient who dies prior to colonoscopy or laparotomy, or presumptive diagnosis with conservative treatment.

Peri-operative Antibiotics: Use 0=no if antibiotic was not ordered. To use 1=yes, antibiotic must be ordered to be given within 1 hour prior to skin incision and must be ordered to be discontinued within 24 hrs of end of time of operation. To use 2=no for medical reason, a medical reason must be documented in the chart that antibiotic not given. **Acceptable antibiotics include:** Ampicilin/sulbactam, Aztreonam, Cefazolin, Cefmetazole, Cefotetan, Cefuroxime, Ciprofloxacin, Clindamycin, Ertapenem, Erythromycin base, Gatifloxacin, Gentamicin, Levofloxacin, Metronidazole, Moxifloxacin, Neomycin, and Vancomycin.

1st-2nd Generation Cepahalosporin: (Cefazolin or Cefuroxime) Use response 1=yes, if ordered. If documented in medical record that not ordered for medical reason use 2. Otherwise use 0=no.

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 #:** 1540 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** Postoperative Stroke or Death in Asymptomatic Patients undergoing Carotid Endarterectomy
De.2 **Brief description of measure***:* Percentage of patients age 18 or older without carotid territory neurologic or retinal symptoms within the one year immediately preceding carotid endarterectomy (CEA) who experience stroke or death following surgery while in the hospital. This measure is proposed for both hospitals and individual surgeons.
1.1-2 **Type of Measure:** Outcome De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Submitted SVS measure: Postoperative Stroke or Death in Asymptomatic Patients undergoing Carotid Artery Stenting
De.4 **National Priority Partners Priority Area:** Population health, Safety, Overuse De.5 **IOM Quality Domain**: Effectiveness, Efficiency, Safety De.6 **Consumer Care Need:** Staying healthy

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** Y☐ N☐

A.4 Measure Steward Agreement attached: Agreement With Measure Stewards_Agreement Between_National Quality Forum (12-6-2010)-634273349246562246.pdf	
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:** Public reporting, Internal quality improvement Accountability, Payment incentive	**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.1Testing:** 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, Patient/societal consequences of poor quality **1a.2** **1a.3 Summary of Evidence of High Impact:** Stroke or death following CEA has been the primary clinical endpoint for multiple randomized trials of CEA (Ref 1-3). Although this is sometimes reported after 30 days, most postoperative strokes or deaths occur in hospital following CEA for asymptomatic patients (Ref 1). This endpoint is easy to capture from claims data and registries. This outcome is particularly important for asymptomatic patients undergoing CEA, since this is a prophylactic operation being proposed to prevent future stroke. As such, guidelines from the American Heart Association recommend CEA for such patients only if the risk of surgical death or stroke combined is less than 3% (Ref 4). This is based on Level I evidence from randomized trials which established the benefit of CEA in asymptomatic patients with at least 60% internal carotid artery (ICA) stenosis, but only if the surgical risk is appropriately low, since the subsequent stroke risk with medical management is not high (Ref 1-2). This contrasts with symptomatic patients with severe ICA stenosis where the stroke risk under medical therapy is high, and justifies CEA even when stroke risks are higher.	**1a** C☐ P☐ M☐ N☐

Stroke is defined as an acute neurological deficit due to an occlusive or hemorrhagic brain lesion that persists more than 24 hours. It can be substantiated by a new stroke seen on brain imaging, but this is not a requirement, i.e., clinical symptoms alone is sufficient. Both minor and major strokes will be counted, as long as the symptoms persist more than 24 hours. Stroke in either carotid distribution, or vertebrobasilar stroke is included, i.e., any postoperative new neurologic deficit attributed to an occlusive or hemorrhagic brain lestion lasting more than 24 hours. From an operational standpoint, post-operative new stroke is defined by medical record coding, ICD-9-CM 997.02.

While stroke or death following CEA is an appropriate quality measure for either symptomatic or asymptomatic patients, we believe that the former group would require risk adjustment to allow fair comparisons, while we do not believe this is necessary for asymptomatic patients. The rationale for this is as follows. Factors such as atrial fibrillation, congestive heart failure, contralateral carotid occlusion and diabetes have been shown to increase stroke risk following CEA, in addition to symptom status, and could be used to justify risk stratification (Ref 9). However, for asymptomatic patients, it is incumbent upon the surgeon to select only those patients of low perioperative risk to benefit from CEA. In fact, the recommendations of the AHA are that this surgery should not be done if risk is high (>3%), without risk adjustment in asymptomatic patients (Ref 4).

We propose that patients need to be asymptomatic regarding the ipsilateral carotid territory for at least one year to qualify for this measure. The basis for this is as follows. In the ACAS trial which demonstrated benefit of CEA in asymptomatic patients in the U.S., these patients had never had ipsilateral carotid TIA or stroke (Ref 1). In the similar European ACST trial, patients had to be asymptomatic for at least 6 months (Ref 2). Results from the NASCET medically treated patients showed that the higher stroke risk after a TIA or stroke was highest initially after the symptomatic event, and gradually decreased to baseline in 2 years (Ref 4). Thus, arguments could be made to define the asymptomatic interval from 6 months to ever, but VSGNNE and SVS recommend a one year time interval to confer asymptomatic status based on commonly accepted practice standards.

Adopting this outcome measure would likely have immediate impact on improving quality. Regional data have shown that feedback of the key outcome of stroke and death, in addition to some process measures after CEA reduced this outcome from 5.6% to 5.0% and in asymptomatic patients from 4.1% to 3.8% (Ref 5). The reporting time frame for hospitals should be on a yearly basis. The time frame for surgeons should be cumulative over their career.

This is an important quality measure, since it is suspected that a number of surgeons and centers performing CEAs do not meet the high standards of the randomized trials which established the benefit of such treatment. It has been shown that mortality following CEA in Medicare patients was 1.4% in hospitals participating in randomized trials, 1.7% in high volume non-trial hospitals, 1.9% in average volume hospitals and fully 2.5% in low volume hospitals (Ref 5). Given that the stroke rate is generally 3 times the mortality rate, this means that some surgeons/centers are likely not achieving optimal results. A recent survey in Canada found that 45% of hospitals are not meeting published guidelines (Ref 7). Adoption of this outcome measure in the United States would likely disclose similar results and lead to quality improvement. The VSGNNE has shown that regional results are good for CEA outcomes, but significant variation does exist between surgeons and centers (Ref 8). This would be the first true outcome measure for vascular surgery, and it would apply to the most frequently performed vascular operation.

1a.4 Citations for Evidence of High Impact:

1. Endarterectomy for asymptomatic carotid artery stenosis. Executive Committee for the Asymptomatic Carotid Atherosclerosis Study. Jama 1995;273(18):1421-8.
2. Halliday A, Mansfield A, Marro J, et al. Prevention of disabling and fatal strokes by successful carotid endarterectomy in patients without recent neurological symptoms: randomised controlled trial. Lancet 2004;363(9420):1491-502.
3. North American Symptomatic Carotid Endarterectomy Trial Collaborators. Beneficial effect of carotid endarterectomy in symptomatic patients with high-grade carotid stenosis. N Engl J Med 1991; 325: 445–53.
4. Biller J, Feinberg WM, Castaldo JE, et al. Guidelines for carotid endarterectomy: a statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association. Stroke; a journal of cerebral circulation 1998;29(2):554-62.

5. Kresowik TF, Bratzler DW, Kresowik RA, et al. Multistate improvement in process and outcomes of carotid endarterectomy. J Vasc Surg 2004;39(2):372-80.
6. Wennberg DE, Lucas FL, Birkmeyer JD, Bredenberg CE, Fisher ES. Variation in carotid endarterectomy mortality in the Medicare population: trial hospitals, volume, and patient characteristics. Jama 1998;279(16):1278-81.
7. Feasby TE, Kennedy J, Quan H, Girard L, Ghali WA. Real-world replication of randomized controlled trial results for carotid endarterectomy. Archives of neurology 2007;64(10):1496-500.
8. Cronenwett JL, Likosky DS, Russell MT, Eldrup-Jorgensen J, Stanley AC, Nolan BW. A regional registry for quality assurance and improvement: The Vascular Study Group of Northern New England (VSGNNE). J Vasc Surg 2007.
9. Tu J, Wang H, Bowyer B, Green L, Fang J, Kucey D. Risk Factors for Death or Stroke After Carotid Endarterectomy: Observations From the Ontario Carotid Endarterectomy Registry. Stroke. 2003;34:2568-2575.

1b. Opportunity for Improvement

1b.1 Benefits (improvements in quality) envisioned by use of this measure: Numerous manuscripts have noted variation in the combined endpoint of stroke or death following carotid endarterectomy. In the Medicare population, the outcome has been shown to vary substantially as a function of hospital volume. This is an important consideration, since it is widely recognized that many surgeons and centers performing CEAs do not meet the high standards of the randomized trials which established the benefit of such treatment. It has been shown that mortality following CEA in Medicare patients was 1.4% in hospitals participating in randomized trials, 1.7% in high volume non-trial hospitals, 1.9% in average volume hospitals and fully 2.5% in low volume hospitals (Ref 6). Given that the stroke rate is generally 3 times the mortality rate, this suggests that some centers/surgeons are not achieving optimal results. A recent survey in Canada found that 45% of hospitals are not meeting published guidelines (Ref 7). Adoption of this outcome measure in the United States would likely disclose similar results and lead to quality improvement when this information was provided to surgeons and centers. This effect has been demonstrated in a midwest regional study by Kresowik et al where stroke and death rate after CEA improved after providing outcome data (Ref 5). The VSGNNE has shown that regional results are good for CEA outcomes, but significant variation does exist between surgeons and centers (Ref 8). Postoperative stroke or death is the accepted outcome paramenter for this surgery, and its measurement and reporting would demonstrate variation and opportunity for improvement

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
It has been shown that mortality following CEA in Medicare patients was 1.4% in hospitals participating in randomized trials, 1.7% in high volume non-trial hospitals, 1.9% in average volume hospitals and fully 2.5% in low volume hospitals (Ref 6). Given that the stroke rate is generally 3 times the mortality rate, this means that many ill advised operations are likely being performed. A recent survey in Canada found that 45% of hospitals are not meeting published guidelines (Ref 7).

For this measure propsal we reviewed 4,613 CEAs performed for asymptomatic patients in VSGNE between 2003 to 2010. Among 17 hosptials, the variation in postoperative stroke or death rate was as follows: The 25th quartile was 0%. The 75th quartile was 1.5%. The median was 0.6%. The range across centers was 0% to 6.4%. Similarly, among 89 individual surgeons the rates were as follows: The 25th quartile was 0%. The 75th quartile was 0.8%. The median was 0%. The range across surgeons was 0% to 25%. This demonstrates substantial variability and performance gap even though the regional average outcome was excellent.

1b.3 Citations for data on performance gap:
See list in 1a.4 above

1b.4 Summary of Data on disparities by population group:
Such data will become available if this measure is adopted for reporting and used by more centers with more varied population demographics than found in the New England region.

1b.5 Citations for data on Disparities:
not available

1b
C☐
P☐
M☐
N☐

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*)**:** discussed above

1c.2-3. Type of Evidence: Cohort study, Expert opinion, Meta-analysis

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
The combined endpoint of stroke/death is the accepted primary endpoint for carotid endarterectomy. Variation in outcome has been established in randomized trials,cohort studies and meta analyses. This outcome measure has face validity among all providers of this service. Studies cited above have shown substantial variation in outcomes by provider when CEA is performed in asymptomatic patients.

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):**
Stroke/death after CAS is the reporting standard recommended by the Society for Vascular Surgery, and has been used in multiple RCTs.

1c.6 Method for rating evidence: Expert opinion.

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

1c.8 Citations for Evidence (*other than guidelines***):** 1.Endarterectomy for asymptomatic carotid artery stenosis. Executive Committee for the Asymptomatic Carotid Atherosclerosis Study. Jama 1995;273(18):1421-8.
2. Halliday A, Mansfield A, Marro J, et al. Prevention of disabling and fatal strokes by successful carotid endarterectomy in patients without recent neurological symptoms: randomised controlled trial. Lancet 2004;363(9420):1491-502.
3. North American Symptomatic Carotid Endarterectomy Trial Collaborators. Beneficial effect of carotid endarterectomy in symptomatic patients with high-grade carotid stenosis. N Engl J Med 1991; 325: 445–53.
4. Biller J, Feinberg WM, Castaldo JE, et al. Guidelines for carotid endarterectomy: a statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association. Stroke; a journal of cerebral circulation 1998;29(2):554-62.
5. Kresowik TF, Bratzler DW, Kresowik RA, et al. Multistate improvement in process and outcomes of carotid endarterectomy. J Vasc Surg 2004;39(2):372-80.
6. Wennberg DE, Lucas FL, Birkmeyer JD, Bredenberg CE, Fisher ES. Variation in carotid endarterectomy mortality in the Medicare population: trial hospitals, volume, and patient characteristics. Jama 1998;279(16):1278-81.
7. Feasby TE, Kennedy J, Quan H, Girard L, Ghali WA. Real-world replication of randomized controlled trial results for carotid endarterectomy. Archives of neurology 2007;64(10):1496-500.
8. Cronenwett JL, Likosky DS, Russell MT, Eldrup-Jorgensen J, Stanley AC, Nolan BW. A regional registry for quality assurance and improvement: The Vascular Study Group of Northern New England (VSGNNE). J Vasc Surg 2007.
9. Tu J, Wang H, Bowyer B, Green L, Fang J, Kucey D. Risk Factors for Death or Stroke After Carotid Endarterectomy: Observations From the Ontario Carotid Endarterectomy Registry. Stroke. 2003;34:2568-2575.

1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number***):**
Biller J, Feinberg WM, Castaldo JE, et al. Guidelines for carotid endarterectomy: a statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association. Stroke; a journal of cerebral circulation 1998;29(2):554-62.

1c.10 Clinical Practice Guideline Citation: Biller J, Feinberg WM, Castaldo JE, et al. Guidelines for carotid endarterectomy: a statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association. Stroke; a journal of cerebral circulation 1998;29(2):554-62.
1c.11 National Guideline Clearinghouse or other URL: N/A

1c
C ☐
P ☐
M ☐
N ☐

1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*)**:** Level 1 **1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF*)**:** AHA **1c.14 Rationale for using this guideline over others:** Universally accepted	
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 age 18 or older without preoperative carotid territory neurologic or retinal sympotoms within the one year immediately preceding CEA who experience stroke or death during their hospitalization following carotid endarterectomy **2a.2 Numerator Time Window** (*The time period in which cases are eligible for inclusion in the numerator*)**:** Lifetime for provider reporting, annual for hospital reporting **2a.3 Numerator Details** (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*)**:** A registry that includes hospitalization details and symptom status within 120 days is required to identify patients for numerator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who were asymptomatic within one year of the CEA(CPT code 37215) who died or experienced postoperative inhospital stroke are included.	
2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured*)**:** Asymptomatic patients (based on NASCET criteria) on the within one year of CEA **2a.5 Target population gender:** Female, Male **2a.6 Target population age range:** 18 years or older **2a.7 Denominator Time Window** (*The time period in which cases are eligible for inclusion in the denominator*)**:** Lifetime for provider reporting, annual for hospital reporting **2a.8 Denominator Details** (*All information required to collect/calculate the denominator - the target*	**2a-specs** **C☐** **P☐** **M☐** **N☐**

population being measured - including all codes, logic, and definitions):
A registry that includes hospitalization details and symptom status within 120 days is required to identify patients for denominator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who were asymptomatic within one year of the CAS (CPT code 37215)are included.

2a.9 **Denominator Exclusions (***Brief text description of exclusions from the target population***):** Patients with neurologic symptoms within one year of surgery

2a.10 **Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Patients with NASCET criteria neurologic symptoms (transient ischemic attack, amaurosis, or stroke) within the one year immediately proceeding CEA

2a.11 **Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
Not required

2a.12-13 **Risk Adjustment Type:** No risk adjustment necessary

2a.14 **Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
See "Scientific Acceptablility" section for rationale

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 = Lower score
2a.21 **Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Asymptomatic patients undergoing CEA who experience inhospital stroke or death/all asymptomatic patients undergoing CEA

2a.22 **Describe the method for discriminating performance** *(e.g., significance testing)*:
Standard statistical comparison of rates to provide confidence levels to discriminate meaningful differences from the mean.

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)*
Registry data

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.***):**
Society for Vascular Surgery Vascular Quality Initiative Registry
Vascular Study Group of New England Registry

2a.26-28 **Data source/data collection instrument reference web page URL or attachment:** Attachment Carotid_Endarterectomy_CB_v1.9.xlsx

2a.29-31 **Data dictionary/code table web page URL or attachment:** Attachment CEA defs v.01.09.doc

2a.32-35 **Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Clinicians: Individual, Clinicians: Group, Facility/Agency, Can be measured at all levels

2a.36-37 **Care Settings (***Check the setting(s) for which the measure is specified and tested)*
Hospital

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

TESTING/ANALYSIS	
2b. Reliability testing **2b.1 Data/sample** *(description of data/sample and size)*: A random sample of 100 patient records representing 5 procedures relevant to the measure from 5 different hospitals based on data collected during the past 2 years. In addition, in-hospital mortality was examined by claims based analysis of 7,205 patients discharged and recorded in the VSGNE registry between 2003 to 2007. **2b.2 Analytic Method** *(type of reliability & rationale, method for testing)*: A nurse abstractor completed a form based on medical record review for the variables relevant to this measure. The results of this chart review were then compared with the original registry data. The Kappa statistic was used to judge reliability of the data. For mortality validation, claims data from each of 12 hospitals were matched to patient identified data within the VSGNE registry to compare discharge status (alive vs. dead). Any discrepencies were then further evaluated based on a medical record audit. **2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*: The key variables for this measure and testing results were: 1. Correct procedure (carotid endarterectomy) performed. Kappa =1.0 2. Hospital mortality: Kappa = .91 (SE .01) 3. Hospital stroke: Kappa = 1.0 4. Asymptomatic 120 days pre-Rx: Kappa = .90 (SE .07)	**2b** C☐ P☐ M☐ N☐
2c. Validity testing **2c.1 Data/sample** *(description of data/sample and size)*: see reliability testing **2c.2 Analytic Method** *(type of validity & rationale, method for testing)*: Comparison of results with expected results from literature. **2c.3 Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*: The percentage of asymptomatic patients being treated with CEA in VSGNE of 68% corresponds to published data on this cohort. The postop stroke or death rate of 1.5% also correponds to published results for asymptomatic patients.	**2c** C☐ P☐ M☐ N☐
2d. Exclusions Justified **2d.1 Summary of Evidence supporting exclusion(s):** Symptomatic patients are excluded because they would require complex risk adjustment that is not available. In such patients, treatment is more often indicated despite risk of treatment. However, for asymptomatic patients, complication rate must be low, less than 3% to justify intervention. **2d.2 Citations for Evidence:** Biller J, Feinberg WM, Castaldo JE, et al. Guidelines for carotid endarterectomy: a statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association. Stroke; a journal of cerebral circulation 1998;29(2):554-62. **2d.3 Data/sample** *(description of data/sample and size)*: SVS Vascular Registry 862 asymptomatic patients undergoing elective CEA **2d.4 Analytic Method** *(type analysis & rationale)*: measure calculation **2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*: Death rate 0.7%, stroke rate 1.28% among 287 provider in 58 centers Interquartile range was 0.2-7.6% for the combined endpoint	**2d** C☐ P☐ M☐ N☐ NA☐

2e. Risk Adjustment for Outcomes/ Resource Use Measures **2e.1 Data/sample** *(description of data/sample and size)*: See "Scientific Acceptablility" section for rationale. Risk adjustment is implicit within this quality measure as judged by the sponsor, the Society for Vascular Surgery, for the following reason. CEA in an asymptomatic patients is a prophylactic procedure designed to prevent future stroke. The decision to perform such a procedure requires the interventionist to calculate the patient´s risk-benefit ratio, in order to avoid post-CEA stroke or death that eliminate the benefit of the procedure. Risk adjustment based on patient factors should not be applied, since high risk patients should not undergo this prophylactic procedure, and using risk adjustment would reward interventionists who selected high risk patients for treatment. **2e.2 Analytic Method** *(type of risk adjustment, analysis, & rationale)*: **2e.3 Testing Results** *(risk model performance metrics)*: **2e.4 If outcome or resource use measure is not risk adjusted, provide rationale:**	**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)*: see section 1.b.3 and above 2,d,5 **2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*: Standard statistial analysis to determine 95% confidence interval for hospitals and providers to determine practical difference from mean **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)*:	**2f** C☐ P☐ M☐ N☐
2g. Comparability of Multiple Data Sources/Methods **2g.1 Data/sample** *(description of data/sample and size)*: other sample not available **2g.2 Analytic Method** *(type of analysis & rationale)*: **2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*:	**2g** C☐ P☐ M☐ N☐ NA☐
2h. Disparities in Care **2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: N/A **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*)**:** Data from SVS VQI and VSGNE are reported to each hospital and provider in a format that can be transmitted to an appropriate public reporting mechanism. **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***):** Vascular Study Group of New England www.vsgne.org Real time reports of outcome measures are provided to practitioners online. These are then used in regional quality improvement programs. **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)***:** VSGNE samples previously described **3a.5 Methods** *(e.g., focus group, survey, QI project)***:** Semi-annual meetings of providers in VSGNE **3a.6 Results** *(qualitative and/or quantitative results and conclusions)***:** Benchamrk reports of this outcome measure have been provided to VSGNE member physician and hospitals since 2003, and discussed at semi-annual meetings. There have been no questions about interpretability.	**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 same target population), Describe why it is a more valid or efficient way to measure quality:**	**3c** C☐ P☐ M☐ N☐ NA☐
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.** Data definitions regarding asymptomatic status based on NASCET criteria have eliminated confusion about symtoms. Death is an accurate endpoint. Stroke has been accurately collected as judged by chart audits and comparison to claims data that has been done within VSGNE.	4d C☐ P☐ M☐ N☐
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:** In the VSGNE experience which has been tracking stroke or death as a major endpoint since 2003, we have not experienced any difficulty with obtaining data related to this endpoint. Our percent missing for this variable has been less than 1%. 4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** In the context of the VSGNE and SVS VQI registries, there is no additional cost as all of these data are already collected. 4e.3 **Evidence for costs:** 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
Society for Vascular Surgery, 633 N. St. Clair, 22nd St., Chicago, Illinois, 60611

Co.2 Point of Contact
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-

Measure Developer If different from Measure Steward
Co.3 Organization
Society for Vascular Surgery, 633 N. St. Clair, 22nd St., Chicago, Illinois, 60611

Co.4 Point of Contact
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-

Co.5 Submitter If different from Measure Steward POC
Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-, Society for Vascular Surgery

Co.6 Additional organizations that sponsored/participated in measure development

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.

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: 2010
Ad.7 Month and Year of most recent revision: 12, 2010
Ad.8 What is your frequency for review/update of this measure?
Ad.9 When is the next scheduled review/update for this measure?

Ad.10 Copyright statement/disclaimers:

Ad.11 -13 Additional Information web page URL or attachment:

Date of Submission (*MM/DD/YY*)**:** 03/27/2011

Carotid Endarterectomy

Last Name | First Name | MI
Date of Birth | MRN | SSN

General Information

Zip Code
Ethnicity ☐ Not Hispanic or Latino; ☐ Hispanic or Latino;
Height ☐ inches or cm
Weight ☐ lbs or kg
Visit code (not required)
Admit Date
Surgeon
Discharge Status ☐ home ☐ rehab unit; ☐ nursing home; ☐ dead; ☐ other hospital; ☐ skilled nursing facility;
*If dead, date of death
Transferred from? ☐ no; ☐ hospital; ☐ rehab uni

Gender ☐ ☐ Male; ☐ Female;
Race ☐ ☐ White; ☐ Black or African American; ☐ ☐ Asian; ☐ Native Hawaiian or Other Pacific Islander ☐ ☐ American Indian or Alaskan Nal ☐ Unknown / Other; ☐ More than one race;
Discharge Date
Surgery Date
Does the patient have Medicare Part B? ☐ no; ☐ yes;

Demographics

Smoking ☐ never; ☐ prior (>1 yr) ☐ current (within yr);
Diabetes ☐ none; ☐ diet; ☐ oral mec ☐ insulin;
CAD symptoms ☐ none; ☐ hx MI but no s ☐ stable angina; ☐ unstable angina or MI <6 mos
CHF ☐ none; ☐ asymp, hx CH ☐ mild; ☐ severe;
Dialysis ☐ no; ☐ functioning transplant; ☐ on dialysis
Stress Test ☐ normal ☐ (+)ischemia ☐ (+)MI ☐ (+)both; ☐ not done;
ASA Class ☐ 1 normal/healthy ☐ 2 w/mild systemic dx ☐ 3 w/severe systemic dx; ☐ 4 w/severe systemic dx that is a constant threat to life; ☐ 5 moribund/not expected to survive w/o op.

Hypertension ☐ no; ☐ yes (>= 140/90 or history);
Beta blockers ☐ no; ☐ Pre-op 1-30 days; ☐ Chronic >30 days; ☐ no-intolerant; ☐ Op day only;
CABG/PTCA ☐ none; ☐ <5yr; ☐ >= 5yrs ago;
COPD ☐ no; ☐ not treated; ☐ on meds; ☐ on home oxygen;
Creatinine mg/dl or µmol/L
Pre-adm Living ☐ home; ☐ nursing hom
g/dl or g/L
Pre-op Hemoglobin

Previous arterial

Bypass ☐ no; ☐ yes;
Aneurysm Repair ☐ no; ☐ yes;
Major Amp ☐ no; ☐ yes;

CEA ☐ no; ☐ yes;
PTA/Stent ☐ no; ☐ yes;

Pre-Op Medications

ASA ☐ no; ☐ yes; ☐ intolerant;
Statin ☐ no; ☐ yes; ☐ intolerant;

Plavix ☐ no; ☐ yes; ☐ intolerant;

History

Symptoms

Ocular Ipsilat ☐ asymptomatic; ☐ TIA; ☐ minor stroke <1 mo; ☐ minor stroke >=1 mo; ☐ major stroke <1 mo; ☐ major stroke >=1 mo;	Ocular Contralat ☐ asymptomatic; ☐ TIA; ☐ minor stroke <1 mo; ☐ minor stroke >=1 mo; ☐ major stroke <1 mo; ☐ major stroke >=1 mo;
Cortical Ipsilat ☐ asymptomatic; ☐ TIA; ☐ minor stroke <1 mo; ☐ minor stroke >=1 mo; ☐ major stroke <1 mo; ☐ major stroke >=1 mo;	Cortical Contralat ☐ asymptomatic; ☐ TIA; ☐ minor stroke <1 mo; ☐ minor stroke >=1 mo; ☐ major stroke <1 mo; ☐ major stroke >=1 mo;
Vertebrobasilar ☐ asymptomatic; ☐ TIA; ☐ minor stroke <1 mo; ☐ minor stroke >=1 mo; ☐ major stroke <1 mo; ☐ major stroke >=1 mo;	Non-specific ☐ no; ☐ yes;
Previous Ipsilat CEA ☐ no; ☐ yes;	Previous Contralateral CEA ☐ no; ☐ yes;
Previous Ipsilat on CT/MRI? ☐ no; ☐ yes; ☐ not done;	Previous Radiation ☐ no; ☐ yes;

Pre-op

Duplex ☐ no; ☐ yes;	MRA ☐ no; ☐ yes;
CTA ☐ no; ☐ yes;	Arteriogram ☐ no; ☐ yes;

ICA Stenosis

Ipsilateral ☐ <50%; ☐ >50%; ☐ >60%; ☐ >70%; ☐ >80%; ☐ occluded;	Contralateral ☐ <50%; ☐ >50%; ☐ >60%; ☐ >70%; ☐ >80%; ☐ occluded; ☐ unknown;

Procedure

Urgency ☐ elective; ☐ urgent; ☐ emergent	Anesthesia ☐ local; ☐ regional; ☐ general;
Side ☐ right; ☐ left;	Type ☐ conventional; ☐ eversion;
Patch ☐ none; ☐ vein; ☐ dacron; ☐ PTFE; ☐ bovine pericardium; ☐ other;	Shunt ☐ no; ☐ yes (routine); ☐ yes (indication);
Skin Prep ☐ chlorhexadine ☐ alcohol; ☐ iodine; ☐ chlor+iodine ☐ chlor+alcoho ☐ iodine+alcohol; ☐ all three	Drain ☐ no; ☐ yes;
Heparin ☐ no; ☐ yes;	Protamine ☐ no; ☐ yes;
Re-explore artery after closure ☐ no; ☐ yes;	Dextran ☐ no; ☐ yes;

Monitoring

Awake ☐ no; ☐ yes;	EEG ☐ no; ☐ yes;
Stump Pressure ☐ no; ☐ yes;	Other ☐ no; ☐ yes;

Heart Rate

On Arrival in OR ☐ bpm	Highest intra-op ☐ bpm

Completion

Doppler ☐ no; ☐ yes;	Duplex ☐ no; ☐ yes;
Angiogram ☐ no; ☐ yes;	Flowprobe ☐ no; ☐ yes;

Concomitant Procedure

CABG ☐ no; ☐ yes;	Proximal Endovascular ☐ no; ☐ yes;
Other Arterial Op ☐ no; ☐ yes;	

Post-Op Information

Cranial Nerve Injury

VII	☐ no; ☐ yes;	IX	☐ no; ☐ yes;
X	☐ no; ☐ yes;	XII	☐ no; ☐ yes;
Other	☐ no; ☐ yes;		
Ipsilat Neurological Event	☐ no; ☐ TIA; ☐ Stroke, minor; ☐ Stroke, major;	Time of Onset	☐ no; ☐ intra-op; ☐ <6hrs post-op; ☐ >=6hrs post-op; ☐ unknown;
Contralat Neurological Event	☐ no; ☐ TIA; ☐ Stroke, minor; ☐ Stroke, major;	Time of Onset	☐ no; ☐ intra-op; ☐ <6hrs post-op; ☐ >=6hrs post-op; ☐ unknown;

IV Med Required for:

Hepertension	☐ no; ☐ yes;	Hypotension	☐ no; ☐ yes;

Complications:

Myocardial Infaction	☐ no; ☐ troponin only; ☐ EKG or clinical;	Dysrhythmia (new)	☐ no; ☐ yes;
CHF	☐ no; ☐ yes;	Wound Infection	☐ no; ☐ yes;
Reperfusion Symptoms	☐ none ☐ seizure or hemorrhage;	Return to OR	☐ no; ☐ yes;
		If Return to OR is yes; enter an answer for Bleeding and Neurologic Event	
Bleeding	☐ no; ☐ ye	Neurologic Event	☐ no; ☐ yes;

Discharge Medications

ASA	☐ no; ☐ yes; ☐ intolerant;	Plavix	☐ no; ☐ yes; ☐ intolerant;
Other Antiplatelet	☐ no; ☐ yes; ☐ intolerant;	Statin	☐ no; ☐ yes; ☐ intolerant;
Beta Blocker	☐ no; ☐ yes; ☐ intolerant;		

Peri-Op Antibiotic Ordered?

Start <1hr Pre-op	☐ no; ☐ yes; ☐ no, for medical reasons;	Stop <24hr Post-Op	☐ no; ☐ yes; ☐ no, for medical reasons;
1st - 2nd Gen Cephalosporin	☐ no; ☐ yes; ☐ no, for medical reasons;		

Carotid Endarterectomy - Follow-up

Last Name:		First Name:		DOB:	
MRN:		SSN:		Zip/Postal Code:	
Visit Code:		Surgeon:		Surgery Date:	
				Side:	

General Information

Date of Contact

Contact By ☐ Office visit; ☐ Phone; ☐ Refused follow-up visit; ☐ Lost to follow-up;

Current Smoking ☐ no; ☐ yes (within last 6 months);

Current Living Status ☐ home; ☐ nursing home; ☐ dead;

Date of Death

Cause ☐ operation related; ☐ non-related; ☐ unsure;

Current Medications

ASA ☐ no; ☐ yes; ☐ intolerant;

Plavix ☐ no; ☐ yes; ☐ intolerant;

Coumadin ☐ no; ☐ yes; ☐ intolerant;

Beta Blocker ☐ no; ☐ yes; ☐ intolerant;

Statin ☐ no; ☐ yes; ☐ intolerant;

Carotid Endarterectomy

Ipsilat Neurologic Event ☐ no; ☐ TIA; ☐ Stroke, minor; ☐ Stroke, major;

Date of Event

Contralat Neurologic Event ☐ no; ☐ TIA; ☐ Stroke, minor; ☐ Stroke, major;

Date of Event

Cranial Nerve Injury ☐ none; ☐ resolved; ☐ persistant;

Duplex CEA Site ☐ <50% ☐ >50% ☐ >60% ☐ >70% ☐ >80% ☐ occluded; ☐ not done; ☐ unknown;

CEA Site Re-operation ☐ no; ☐ yes;

Date of Re-op

CEA Site PTA ☐ no; ☐ yes;

Date of PTA/Stent

CAROTID ENDARTERECTOMY DEFINITIONS – v.01.09

If more than one response applies, select the most severe (highest number) response for each data field.

Pre-op

Smoking: Prior = quit ≥ 1 year ago. Current = still smoking within last 12 months. Include cigarettes, pipe, or cigar.

HTN (Hypertension): Defined as ≥ 140/90, either systolic or diastolic, at admission or within last 6 months, or clearly documented in medical record.

Beta-blockers: Peri-operative = started within one month before surgery or during surgery. Chronic = more than one month before surgery.

CAD Symptoms (Coronary artery disease**):** Stable angina = stable pattern or symptoms with or without anti-anginal medication. Unstable angina = new onset, increasing frequency, lasting > 20 min and/or rest angina.

CABG/PTCA: Coronary artery bypass, angioplasty, or stent.

CHF (Congestive Heart Failure): Documented CHF: Mild = SOB on exertion; Severe = SOB at rest, pulmonary edema, or pitting ankle edema. (Use 2 = mild if severity not documented.)

COPD: Not treated = COPD documented in record but not treated with medication. Medication includes theophylline, aminophylline, inhalers or steroids

Dialysis: Transplant = patient has functioning kidney transplant; Dialysis = currently on hemo- or peritoneal dialysis.

Creatinine: Last available measurement taken before procedure. If multiple measurements, use highest within 30 days of surgery.

Stress Test: Includes stress EKG, stress echo, nuclear stress scans, within 2 years of surgery.

Previous Arterial:

Bypass - Any non-cardiac arterial bypass for occlusive disease
CEA - Carotid endarterectomy
Aneurysm Repair – Any known true arterial aneurysm repair (excluding cerebral or pseudo-aneurysm)
PTA/Stent – Of any non-cardiac artery
Major Amputation – Any amputation above the foot or hand

Pre-admin living: Use last living status before any current, acute hospitalization or rehab unit.

Pre-Op Medications: Taken within 36 hours of surgery. Statins include any HMG-CoA reductase inhibitor, such as Lipitor, Mevacor, Pravachol, Zocor, Lescol, etc. If Plavix is discontinued prior to surgery it should be coded = 0.

Pre-op Hemoglobin: Most recent pre-op hemoglobin within past 30 days.

Symptoms: Ocular: unilateral visual loss or major blurring, etc. Cortical: unilateral motor and/or memory loss, or dysphagia/aphasia, etc. Vertebrobasiliar: bilateral motor, sensory, or visual loss, diplopia, ataxaia, etc. Major cortical or vertebrobasilar stroke = disability causing non-independent living status. Minor stroke is non-disabling. Major ocular stroke = blindness, otherwise minor. Stroke<1 month means stroke within previous month before surgery, etc. TIA=transient ischemic attack completely resolved within 24 hours.

Non-specific: Not clearly a carotid or vertebrobasilar TIA, e.g., light-headedness, dizziness

Ipsilat stroke on CT/MRI: Carotid territory only.

CEA: Carotid endarterectomy

Previous radiation: Radiation therapy in a field including the affected carotid artery.

ICA stenosis: Use most severe category by modality thought to be most accurate if multiple modalities used.

Procedure

Urgency: Urgent = surgery within 24 hrs of admit or patient can't be discharged; emergent = surgery within 6 hrs of admission.

Shunt: If used, specify if routinely used (1), or if placed selectively in this patient for a specific indication (2).

Re-explore artery after closure: for defect detected after closure during same operation.

Concomitant Procedure

Proximal endovascular: Angioplasty or stent of more proximal carotid, innominate artery.

Post-op

Cranial nerve injury: Any occurrence, transient or persisting: VII-facial droop or more severe; IX-swallowing difficulty unless other diagnosis confirmed; X- hoarseness unless laryngoscopy normal; XII-any tongue deviation or dis-coordination

Ipsilat/Contralat neurologic event: Cerebral or ocular. TIA = cortical or ocular symptoms <24hrs duration. Major cortical or vertebrobasilar stroke = disability causing non-independent living status. Otherwise, minor. Major ocular stroke = blindness, otherwise minor. Minor stroke is non-disabling.

Time of Onset Ipsila/Contralat: Time when first noticed, but if noted on awakening from anesthesia code as 1=intra-op. Use 2=≤6 hrs post-op if normal at completion of procedure, and then neurologic event developed.

Reperfusion Symptoms: Seizures associated with headache, or hemorrhage on CT/MRI.

IV meds required: Indicates continuous infusion or more than one dose required more than one hour after surgery.

Myocardial Infarction: Troponin: by local standards for MI. EKG: new Q waves, new ST and T wave changes. Clinical: documentation of MI by clinical criteria or ECHO or other imaging modality.

Dysrhythmia: New rhythm disturbance requiring treatment with medications or cardioversion.

CHF: Pulmonary edema with requirement for monitoring or treatment in ICU.

Return to OR for bleeding: Applies to carotid endarterectomy incision only. Use 666 if Return to OR = 0.

Return to OR for Neurologic Event: Use 666 if Return to OR = 0.

Peri-operative Antibiotics: Use 0=no if antibiotic was not ordered. To use 1=yes, antibiotic must be ordered to be given within 1 hour prior to skin incision and must be ordered to be discontinued within 24 hrs of end of time of operation. To use 2=no for medical reason, a medical reason must be documented in the chart that antibiotic not given. **Acceptable antibiotics include:** Ampicilin/sulbactam, Aztreonam, Cefazolin, Cefmetazole, Cefotetan, Cefuroxime, Ciprofloxacin, Clindamycin, Ertapenem, Erythromycin base, Gatifloxacin, Gentamicin, Levofloxacin, Metronidazole, Moxifloxacin, Neomycin, and Vancomycin.

1st-2nd Generation Cepahalosporin: (Cefazolin or Cefuroxime) Use response 1=yes, if ordered. If documented in medical record that not ordered for medical reason use 2. Otherwise use 0=no.

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 #:** 1543 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** Postoperative Stroke or Death in Asymptomatic Patients undergoing Carotid Artery Stenting (CAS)
De.2 **Brief description of measure:** Percentage of patients 18 years of age or older without carotid territory neurologic or retinal symptoms within 120 days immediately proceeding carotid angioplasty and stent (CAS) placement who experience stroke or death during their hospitalization for this procedure. This measure is proposed for both hospitals and individual interventionalists.
1.1-2 **Type of Measure:** Outcome De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Submitted SVS measure: Postoperative Stroke or Death in Asymptomatic Patients undergoing Carotid Endarterectomy
De.4 **National Priority Partners Priority Area:** Population health, Safety, Overuse De.5 **IOM Quality Domain**: Effectiveness, Efficiency, Safety De.6 **Consumer Care Need:** Staying healthy

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	A Y☐ N☐

measure submission A.4 **Measure Steward Agreement attached:** Agreement With Measure Stewards_Agreement Between_National Quality Forum (12-6-2010)-634274164751404870.pdf	
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:** Public reporting, Internal quality improvement Accountability, Payment incentive	**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, Patient/societal consequences of poor quality 1a.2 1a.3 **Summary of Evidence of High Impact:** Percutaneous carotid intervention is a rapidly emerging field. Published trial results have established carotid stenting (CAS) in high risk surgical patients to be an effective alternative to carotid endarterectomy (CEA). It is well established that CEA benefits patients with asymptomatic >60% stenosis only if performed with a high degree of technical proficiency on appropriately selected patients. The same is proposed to hold true for CAS. This is particularly important when considering an asymptomatic population where the relative risk reduction with intervention is narrow when compared to medical management. Numerous publications have noted variation in the combined endpoint of stroke and death following carotid angioplasty and stent placement with embolic protection (5). Adoption of this outcome measure in the United States would likely disclose disperate results between hospitals and between providers, and lead to quality improvement when this information was provided to individual providers and participating centers. The SVS Vascular Registry has shown that outcome results are good for	**1a** C☐ P☐ M☐ N☐

CAS, but variations exist between interventionalists and centers (8). Postoperative stroke or death is the accepted outcome parameter for this procedure, and its measurement and reporting would demonstrate variation and opportunity for improvemement. CAS is an elective procedure in nearly all cases. Patients can be referred or transferred to a center with the personnel and experience to perform this procedure with a high level of competence and any procedure that has "stroke" as a potential risk should be performed only by individuals with appropriate training and experience. (1)

1a.4 **Citations for Evidence of High Impact:** 1.) Carotid Artery Angioplasty and Stent Placement: Quality Improvement Guidelines to Ensure Stroke Risk Reduction, J Vasc Interv Radiol 2003;14;S317-9. 2.) Executive Committee for the Asymptomatic Carotid Atherosclerosis Study. Endarterectomy for asymptomatic carotid artery stenosis, JAMA 1995;273:1421-8. 3.) Management of Atherosclerotic Carotid Artery Disease: Clinical Practice Guidelines of the Society for Vascular Surgery, J Vasc Surg 2008;48:480-6. 4.) Clinical Competence Statement on Carotid Stenting: Training and Credentialing for Carotid Stenting-Multispecialty Consensus Recommendations, J Vasc Surg 2005;41:160-8. 5.) Percutaneous Transluminal Angioplasty and Stenting for Carotid Artery Stenosis, Cochrane Database Syst Rev 2007;(4):CD000515. 6.) Endarterectomy vs Stenting for Carotid Artery Stenosis: A Systematic Review and Meta-analysis, J Vasc Surg 2008;48:487-93. 7.) Carotid Stenting and Angioplasty, Circulation 1998;97:121-3. 8. Risk-adjusted 30-day outcomes of carotid stenting and endarterectomy: Results from the SVS Vascular Registry, J Vasc Surg 2008.

1b. Opportunity for Improvement

1b.1 **Benefits (improvements in quality) envisioned by use of this measure:** Better patient selection to avoid treating high risk patients who will likely experience stroke or death after CAS for asymptomatic patients which eliminates any benefit of the procedure.

1b.2 **Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Stroke or death following CAS has been the primary clinical endpoint for a number of clinical CAS trials. Stroke or death within 30 days following intervention is captured in the SVS Registry. This endpoint is easy to capture from claims data and registries. This outcome is particularly important for asymptomatic patients undergoing CAS, since this is a prophylactic procedure being proposed to prevent future stroke. Guidelines from the American Heart Association recommend CEA for such patients only if the risk of surgical death or stroke combined is less than 3%. While there is no similar level published as a guideline, the same clinical threshold of 3% can be used for asymptomatic patients undergoing CAS. Cochrane Database analysis of stroke or death within 30 days of CAS for asymptomatic carotid stenosis showed no difference between CEA and CAS in all patients as well for a subset of patients deemed "not suitable for surgery" (CEA). Similarly, two large industry-sponsored carotid stent trials, CAPTURE-2 and EXACT, both demonstrated outcomes for CAS in asymptomatic patients that were "comparable to those established by the AHA for patients treated with CEA".

Stroke is defined as an acute neurological deficit due to an occlusive or hemorrhagic brain lesion that persists more than 24 hours. It can be substantiated by a new stroke seen on brain imaging, but this is not a requirement, i.e., clinical symptoms alone are sufficient. Both minor and major strokes will be counted, as long as the symptoms persist more than 24 hours. Stroke in either carotid distribution, or vertebrobasilar stroke is included, i.e., any postprocedural new neurologic deficit attributed to an occlusive or hemorrhagic brain lestion lasting more than 24 hours.

While stroke or death following CAS is an appropriate quality measure for either symptomatic or asymptomatic patients, we believe that the former group would require risk adjustment to allow fair comparisons, while we do not believe this is necessary for asymptomatic patients. For asymptomatic patients, it is incumbent upon the interventionalist to select only those patients of low periprocedural risk to benefit from CAS.

We propose that patients need to be asymptomatic regarding the ipsilateral carotid territory for at least one year to qualify for this measure. The Society for Vascular Surgery recommends a one year time interval to confer asymptomatic status based on commonly accepted practice standards.

Adopting this outcome measure would likely have immediate impact on improving quality. Regional data have shown that feedback of the key outcome of stroke and death, in addition to some process measures

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after carotid endarterectomy reduced this outcome from 5.6% to 5.0% and in asymptomatic patients from 4.1% to 3.8%. The same is likely to hold true for CAS. Reporting time frame for hospitals should be on a yearly basis. The time frame for interventionalists should be cumulative over their career.

1b.3 Citations for data on performance gap:
To date, there is no strong evidence that CAS for asymptomatic carotid stenosis provides a significant benefit to patients over best medical therapy. Nevertheless, CAS is being performed for the treatment of asymptomatic stenosis in multiple centers in the US. The results of controlled randomized trials are pending and should soon provide the Level 1 evidence required.

Although CAS is not approved for reimbursement by CMS for asymptomatic patients, this procedure is performed for asymptomatic patients in 65% of patients in VSGNE undergoing CAS. We suspect overuse in many of these patients.

1b.4 Summary of Data on disparities by population group:
Such data will become available if this measure is adopted for reporting and used by more centers with more varied population demographics than found in the New England region.

1b.5 Citations for data on Disparities:
not available

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*)**:** discussed above

1c.2-3. Type of Evidence: Cohort study, Expert opinion, Meta-analysis

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
The combined endpoint of stroke/death is the accepted primary endpoint for both CAS and carotid endarterectomy. Variation in outcome has been established in randomized trials,cohort studies and meta analyses. This outcome measure has face validity among all providers of this service. Studies cited above have shown substantial variation in outcomes by provider when CEA is performed in asymptomatic patients. While such data does not yet exist for CAS, similar findings are expected due to the same patient population being treated.

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):**
Stroke/death after CAS is the reporting standard recommended by the Society for Vascular Surgery.

1c.6 Method for rating evidence: Expert opinion.

1c.7 Summary of Controversy/Contradictory Evidence: The endpoint of stroke, death or myocardial infarction is a frequent endpoint in CAS studies. However, this is seldom used in CEA studies, and recent studies have shown that the impact of MI is much less than the impact of stroke after CAS. Thus, we favor stroke/death as the primary endpoint for this measure.

1c.8 Citations for Evidence (*other than guidelines***):** 1.) Carotid Artery Angioplasty and Stent Placement: Quality Improvement Guidelines to Ensure Stroke Risk Reduction, J Vasc Interv Radiol 2003;14;S317-9. 2.) Executive Committee for the Asymptomatic Carotid Atherosclerosis Study. Endarterectomy for asymptomatic carotid artery stenosis, JAMA 1995;273:1421-8. 3.) Management of Atherosclerotic Carotid Artery Disease: Clinical Practice Guidelines of the Society for Vascular Surgery, J Vasc Surg 2008;48:480-6. 4.) Clinical Competence Statement on Carotid Stenting: Training and Credentialing for Carotid Stenting-Multispecialty Consensus Recommendations, J Vasc Surg 2005;41:160-8. 5.) Percutaneous Transluminal Angioplasty and Stenting for Carotid Artery Stenosis, Cochrane Database Syst Rev 2007;(4):CD000515. 6.) Endarterectomy vs Stenting for Carotid Artery Stenosis: A Systematic Review and Meta-analysis, J Vasc Surg 2008;48:487-93. 7.) Carotid Stenting and Angioplasty, Circulation 1998;97:121-3. 8. Risk-adjusted 30-day outcomes of carotid stenting and endarterectomy: Results from the SVS Vascular Registry, J Vasc Surg 2008.

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1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number*): Presently there is no published guideline that places a threshold for acceptable stroke and death rates following CAS for the treatment of asymptomatic carotid stenosis. There is, however, an acceptable and published threshold of 3% for patients treated with the established surgical alternative, CEA. The AHA has determined that CEA in particular should only be performed for asymptomatic carotid stenosis if the risk of the procedure was les than 3% stroke and/or death (2). It has been suggested that this is fairly generalizable to any form of intervention (1) **1c.10 Clinical Practice Guideline Citation:** Risk-adjusted 30-day outcomes of carotid stenting and endarterectomy: Results from the SVS Vascular Registry, J Vasc Surg 2008. **1c.11 National Guideline Clearinghouse or other URL:** NA **1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*):** NA **1c.13 Method for rating strength of recommendation (*If different from USPSTF system, also describe rating and how it relates to USPSTF)*:** NA **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 over age 18 without preoperative carotid territory neurologic or retinal sympotoms within one year of their procedure who experience stroke or death during their hospitalization following elective carotid artery angioplasty and stent placement **2a.2 Numerator Time Window (*The time period in which cases are eligible for inclusion in the numerator*):** Lifetime for provider reporting, annual for hospital reporting **2a.3 Numerator Details (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*):** A registry that includes hospitalization details and symptom status within 120 days is required to identify patients for numerator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who were asymptomatic within one year of the CAS (CPT code 37215) who died or had a stroke recorded in the registry during that admission.	**2a-specs** **C☐** **P☐** **M☐** **N☐**

2a.4 **Denominator Statement (***Brief, text description of the denominator - target population being measured***):**
Patients over age 18 without preoperative carotid territory neurologic or retinal symptoms within one year immediately preceding carotid artery stenting

2a.5 **Target population gender:** Female, Male
2a.6 **Target population age range:** Over 18

2a.7 **Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
Lifetime for provider reporting, annual for hospital reporting

2a.8 **Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
A registry that includes hospitalization details and symptom status within one year is required to identify patients for numerator inclusion. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients who were asymptomatic within one year of the CAS (CPT code 37215) are included.

2a.9 **Denominator Exclusions (***Brief text description of exclusions from the target population***):** Exclude patients with neurologic symptoms within one year of procedure

2a.10 **Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Patients with NASCET criteria neurologic symptoms (transient ischemic attack, amaurosis, or stroke) within the one year immediately proceeding CAS

2a.11 **Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
Not required

2a.12-13 **Risk Adjustment Type:** No risk adjustment necessary

2a.14 **Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
See "Scientific Acceptablility" section for rationale

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 = Lower score
2a.21 **Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Number of asymptomatic patients undergoing CAS who have in hospital stroke or death / Number of asymptomatic patients undergoing CAS

2a.22 **Describe the method for discriminating performance** *(e.g., significance testing)***:**
Standard statistical comparison of rates to provide confidence levels to discriminate meaningful differences from the mean.

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)*:

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

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.***):**
Society for Vascular Surgery Vascular Quality Initiative Registry
Vascular Study Group of New England Registry

2a.26-28 **Data source/data collection instrument reference web page URL or attachment:** Attachment

Carotid_Artery_Stent_CB_v_1.9.xlsx

2a.29-31 **Data dictionary/code table web page URL or attachment:** Attachment CAS defs v.01.09.doc

2a.32-35 **Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Clinicians: Individual, Clinicians: Group, Facility/Agency, Can be measured at all levels

2a.36-37 **Care Settings** (*Check the setting(s) for which the measure is specified and tested)*
Hospital

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

TESTING/ANALYSIS

2b. Reliability testing

2b.1 **Data/sample** *(description of data/sample and size)*: A random sample of 100 patient records representing 5 procedures relevant to the measure from 5 different hospitals based on data collected during the past 2 years. In addition, in-hospital mortality was examined by claims based analysis of 7,205 patients discharged and recorded in the VSGNE registry between 2003 to 2007.

2b.2 **Analytic Method** *(type of reliability & rationale, method for testing)*:
A nurse abstractor completed a form based on medical record review for the variables relevant to this measure. The results of this chart review were then compared with the original registry data. The Kappa statistic was used to judge reliability of the data. For mortality validation, claims data from each of 12 hospitals were matched to patient identified data within the VSGNE registry to compare discharge status (alive vs. dead). Any discrepencies were then further evaluated based on a medical record audit.

2b.3 **Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:
The key variables for this measure and testing results were:

1. Correct procedure (carotid artery stenting) performed. Kappa =1.0
2. Hospital mortality: Kappa = .91 (SE .01)
3. Hospital stroke: Kappa = 1.0
4. Asymptomatic 120 days pre-Rx: Kappa = .90 (SE .07)

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 **Data/sample** *(description of data/sample and size)*: see reliability

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
Multiple sources from the medical record were used as the gold standard, and rates compared with literature.

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
The percentage of asymptomatic patients being treated in VSGNE of 60% corresponds to published data on this cohort. The postop stroke or death rate of 2.2% also correponds to published results for asymptomatic patients.

2c C☐ P☐ M☐ N☐

2d. Exclusions Justified

2d.1 **Summary of Evidence supporting exclusion(s):**
Symptomatic patients are excluded because they would require complex risk adjustment that is not available. In such patients, treatment is more often indicated despite risk of treatment. However, for asymptomatic patients, complication rate must be low, less than 3% to justify intervention.

2d C☐ P☐ M☐ N☐ NA☐

2d.2 Citations for Evidence: Biller J, Feinberg WM, Castaldo JE, et al. Guidelines for carotid endarterectomy: a statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association. Stroke; a journal of cerebral circulation 1998;29(2):554-62. **2d.3 Data/sample** *(description of data/sample and size)*: SVS Vascular Registry 805 asymptomatic patients undergoing elective CEA **2d.4 Analytic Method** *(type analysis & rationale)*: measure calculation **2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*: Death rate 2.0%, stroke rate 2.11% among 287 provider in 58 centers Interquartile range was 0.3-8.6% for the combined endpoint	
2e. Risk Adjustment for Outcomes/ Resource Use Measures **2e.1 Data/sample** *(description of data/sample and size)*: See "Scientific Acceptablility" section for rationale. Risk adjustment is implicit within this quality measure as judged by the sponsor, the Society for Vascular Surgery, for the following reason. CAS in an asymptomatic patients is a prophylactic procedure designed to prevent future stroke. The decision to perform such a procedure requires the interventionist to calculate the patient´s risk-benefit ratio, in order to avoid post-CAS stroke or death that eliminate the benefit of the procedure. Risk adjustment based on patient factors should not be applied, since high risk patients should not undergo this prophylactic procedure, and using risk adjustment would reward interventionists who selected high risk patients for treatment. **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)*: see section 1.b.3 and above 2,d,5 **2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*: Standard statistial analysis to determine 95% confidence interval for hospitals and providers to determine practical difference from mean **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)*:	**2f** C☐ P☐ M☐ N☐
2g. Comparability of Multiple Data Sources/Methods **2g.1 Data/sample** *(description of data/sample and size)*: no other data sources available **2g.2 Analytic Method** *(type of analysis & rationale)*: **2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*:	**2g** C☐ P☐ M☐ N☐ NA☐
2h. Disparities in Care	**2h**

2h.1 If measure is stratified, provide stratified results *(scores by stratified categories/cohorts)*: N/A **2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**	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*): Data from SVS VQI and VSGNE are reported to each hospital and provider in a format that can be transmitted to an appropriate public reporting mechanism. **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***):** Vascular Study Group of New England www.vsgne.org Data have been successfully collected in this quality registry since 2003, and reports provided to participating physicians and hospitals about their rates of outcomes. These results are used by the regional quality group to provide benchmark reporting, and to stimulate regional quality improvement projects. **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)*: VSGNE samples previously described **3a.5 Methods** *(e.g., focus group, survey, QI project)*: Semi-annual meetings of providers in VSGNE **3a.6 Results** *(qualitative and/or quantitative results and conclusions)*: Benchamrk reports of this outcome measure have been provided to VSGNE member physician and hospitals since 2003, and discussed at semi-annual meetings. There have been no questions about interpretability.	**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:** N/A **5.1 If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:** N/A	**3c** C☐ P☐ M☐ N☐ NA☐
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.** Data definitions regarding asymptomatic status based on NASCET criteria have eliminated confusion about symtoms. Death is an accurate endpoint. Stroke has been accurately collected as judged by chart audits and comparison to claims data that has been done within VSGNE.	**4d** C☐ P☐ M☐ N☐
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:**	**4e** C☐ P☐ M☐ N☐

In the VSGNE experience which has been tracking stroke or death as a major endpoint since 2005, we have not experienced any difficulty with obtaining data related to this endpoint. Our percent missing for this variable has been less than 1%. 4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** In the context of the VSGNE and SVS VQI registries, there is no additional cost as all of these data are already collected. 4e.3 **Evidence for costs:** 4e.4 **Business case documentation:** N/A	
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** Society for Vascular Surgery, 633 N. St. Clair, 22nd floor, Chicago, Illinois, 60611 Co.2 **Point of Contact** Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-	
Measure Developer If different from Measure Steward Co.3 **Organization** Society for Vascular Surgery, 633 N. St. Clair, 22nd floor, Chicago, Illinois, 60611 Co.4 **Point of Contact** Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-	
Co.5 **Submitter If different from Measure Steward POC** Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-, Society for Vascular Surgery	
Co.6 **Additional organizations that sponsored/participated in measure development**	
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.** N/A	
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:** 2010 **Ad.7 Month and Year of most recent revision:** 12, 2010 **Ad.8 What is your frequency for review/update of this measure?** **Ad.9 When is the next scheduled review/update for this measure?**
Ad.10 Copyright statement/disclaimers:
Ad.11 -13 Additional Information web page URL or attachment:
Date of Submission (*MM*/*DD*/*YY*)**:** 03/27/2011

Carotid Artery Stent

Last Name | First Name | MI

Date of Birth | MR# | SSN

General Information

Zip Code

Ethnicity ☐ Not Hispanic or Lati ☐ Hispanic or Latino;

Height ☐ inches or cm

Weight ☐ lbs or kg

Visit code (not required)

Admit Date

Surgeon

Discharge Status ☐ home; ☐ rehab unit; ☐ nursing home; ☐ dead; ☐ other hospital; ☐ skilled nursing facility;

*If dead, date of death

Transferred from? ☐ no; ☐ hospital; ☐ rehab unit;

Gender ☐ male; ☐ female;

Race ☐ American Indian or Alaskan Nati ☐ Asian; ☐ Black or African A ☐ Native Hawaiian or other Pacific Is ☐ White; ☐ more than 1 race; ☐ Unknown/other;

Discharge Date

Surgery Date

Does the patient have Medicare Part B? ☐ no ☐ yes;

Medicare Health Insurance Claim Number

Demographics

Smoking ☐ never; ☐ prior (>1 yr); ☐ current (within yr);

Diabetes ☐ none; ☐ diet; ☐ oral meds; ☐ insulin;

CAD symptoms ☐ none; ☐ Hx MI but no sx; ☐ stable angina; ☐ unstable angina or MI < 6 mos;

CHF ☐ none; ☐ asymp, hx CHF; ☐ mild; ☐ severe;

Dialysis ☐ no; ☐ functioning transplant; ☐ on dialysis;

Stress Test ☐ normal ☐ (+) ischemia; ☐ (+) MI ☐ (+)both; ☐ not done;

ASA Class ☐ 1 normal/healthy; ☐ 2 w/mild systemic dx; ☐ 3 w/severe s ☐ 4 w/severe systemic dx that is a constant threat to life; ☐ 5 moribund, not expected to survive w/o op;

Hypertension ☐ no ☐ yes (>=140/90 or history);

Beta blockers ☐ no ☐ pre-op 1-30 days; ☐ chronic >30 days; ☐ no-intolerant ☐ op day only;

CABG/PTCA ☐ non ☐ <5yr; ☐ >=5yrs ago;

COPD ☐ no ☐ not treated; ☐ on meds; ☐ on home oxygen;

Creatinine ☐ mg/dl or µmol/L

Pre-adm Living ☐ home ☐ nursing home;

Pre-op Hemoglobin ☐ g/dl or g/L

Previous arterial

Bypass ☐ no; ☐ yes;

Aneur Repair ☐ no; ☐ yes;

Major Amp ☐ no; ☐ yes;

CEA ☐ no; ☐ yes;

PTA/Stent ☐ no; ☐ yes;

Pre-Op Medications

ASA ☐ no; ☐ yes; ☐ intolerant;

Statin ☐ no; ☐ yes; ☐ intolerant;

Plavix ☐ no; ☐ yes; ☐ intolerant;

History

Symptoms

Ocular Ipsilat ☐ asymptomatic; ☐ TIA; ☐ Minor stroke < 1 mo; ☐ Minor stroke >= 1 mo; ☐ Major stroke < 1 mo; ☐ Major stroke >= 1 mo;

Cortical Ipsilat ☐ asymptomatic; ☐ TIA; ☐ Minor stroke < 1 mo; ☐ Minor stroke >= 1 mo; ☐ Major stroke < 1 mo; ☐ Major stroke >= 1 mo;

Vertebrobasilar ☐ asymptomatic; ☐ TIA; ☐ Minor stroke < 1 mo; ☐ Minor stroke >= 1 mo; ☐ Major stroke < 1 mo; ☐ Major stroke >= 1 mo;

Ocular Contralat ☐ asymptomatic; ☐ TIA; ☐ Minor stroke < 1 mo; ☐ Minor stroke >= 1 mo; ☐ Major stroke < 1 mo; ☐ Major stroke >= 1 mo;

Cortical Contralat ☐ asymptomatic; ☐ TIA; ☐ Minor stroke < 1 mo; ☐ Minor stroke >= 1 mo; ☐ Major stroke < 1 mo; ☐ Major stroke >= 1 mo;

Non-specific ☐ no; ☐ yes;

Previous Ipsilat CEA ☐ no; ☐ yes;

Previous Ipsilat Carotid Stent ☐ no; ☐ yes;

Medical High Risk ☐ no; ☐ yes;

***NOTE:** If Ocular Ipsilat, Ocular Contralat, Cortical Ipsilat, and/or Cortical Contralat equals minor or major stroke, please complete Rankin Score.

Previous Contralat CEA ☐ no; ☐ yes;

Ipsilat Stroke on CT/MRI ☐ no; ☐ yes ☐ not done;

Anatomic High Risk ☐ no; ☐ yes;

Pre-op

Refused for Surgery ☐ no; ☐ yes;

Duplex ☐ no; ☐ yes;

CTA ☐ no; ☐ yes;

MRA ☐ no; ☐ yes;

Arteriogram ☐ no; ☐ yes;

*Rankin Score

☐ no symptoms; ☐ no significant disability (able to carry out all usual activities despite symptoms); ☐ slight disability (able to look after own affairs without assistances, but unable to carry out all); ☐ moderate disability (requires some help, but able to walk unassisted); ☐ moderately severe disability (unable to attend to own bodiy needs without assistance, and unable to walk unassisted); ☐ severe disability (requires constant nursing care and attention, bedridden, incontinent);

ICA Stenosis

Ipsilateral ☐ <50%; ☐ >50%; ☐ >60%; ☐ >70%; ☐ >80%; ☐ occlude

Contralateral ☐ <50%; ☐ >50%; ☐ >60%; ☐ >70%; ☐ >80%; ☐ occluded; ☐ unknown;

Procedure

Urgency ☐ elective; ☐ urgent; ☐ emergent;

Side ☐ right; ☐ left;

Stenosis by Angiography [ ] %

Upper Extent of Lesion (Location) ☐ C1; ☐ C2; ☐ C3; ☐ C4; ☐ C5; ☐ C6;

Pre-dilate Before Protection Device ☐ no; ☐ yes;

Site ☐ IR; ☐ cardiac cath; ☐ OR, fixed; ☐ OR, mobile;

Lesion Type ☐ atherosclerosi ☐ re-stenosis; ☐ dissection; ☐ other;

Second Stenosis ☐ no; ☐ yes;

Approach ☐ femoral; ☐ trans-femoral ☐ brachial;

Technical Failure ☐ no; ☐ yes;

Anesthesia ☐ local; ☐ general;

Second Stenosis Severity [ ] %

Lesion Length [ ] mm

Prophylactic Anti-bradyarrhythmic ☐ no; ☐ yes;

If Technical Failure equals yes, skip to Heparin; if Technical Failure equals no, answer all questions below.

Protection Device ☐ none; ☐ Angioguard; ☐ Accunet; ☐ Filterwire; ☐ Percusurg ☐ Retrograde flow; ☐ Neuroshield; ☐ other; ☐ Emboshield; ☐ Spider;

Pre-dilate Before Stent ☐ no; ☐ yes;

Stent Type ☐ Wall; ☐ Precise; ☐ Acculink ☐ Xact; ☐ Nextstent; ☐ Vivexx; ☐ other;

Stent Diameter [ ] mm smallest diameter used; 999 if Nexstent is used

Tapered ☐ no; ☐ yes;

Stent Length [ ] mm

Number of Stents [ ] # of stents used

Post Dilate ☐ no; ☐ yes;

Balloon Diameter [ ] mm

Proximal CCA Stent ☐ no; ☐ yes;

Heparin ☐ no; ☐ yes;

Protamine ☐ no; ☐ yes;

Contrast Volume [ ] ml

Bradyarrhythmia Requiring Tx ☐ no; ☐ yes;

Protection Device Failure ☐ no; ☐ yes;

Neurologic Change ☐ no; ☐ yes;

Neuro Change Type ☐ decreased LOC; ☐ seizure; ☐ TIA; ☐ Stroke; ☐ Other;

Heart Rate

On Arrival in OR [ ] bpm

Highest intra-op [ ] bpm

Post-Op Data

Ipsilat Neurologic Event ☐ no; ☐ TIA; ☐ stroke, minor; ☐ stroke, major;

Time of Onset ☐ no; ☐ intra-op; ☐ < 6hrs post-op; ☐ >= 6hrs post-op; ☐ unknown;

Contralat Neurologic Event ☐ no; ☐ TIA; ☐ stroke, minor; ☐ stroke, major;

Time of Onset ☐ no; ☐ intra-op; ☐ < 6hrs post-op; ☐ >= 6hrs post-op; ☐ unknown;

2b3a Inhibitor Post-Op ☐ no; ☐ yes;

Reperfusion Symptoms ☐ none; ☐ seizure or hemmorage;

Myocardial Infarction ☐ no; ☐ troponin only; ☐ EKG or clinical;

CHF ☐ no; ☐ yes;

Dysrhythmia (new) ☐ no; ☐ yes;

Access Site CX ☐ no; ☐ minimal hematoma / PA; ☐ hematoma / PA required transfusion; ☐ required operation; ☐ arterial occlusion;

IV Med Required for:

Hypertension ☐ no; ☐ yes;

Hypotension ☐ no; ☐ yes;

Discharge Medications

ASA ☐ no; ☐ yes; ☐ intolerant;

Plavix ☐ no; ☐ yes; ☐ intolerant;

Statin ☐ no; ☐ yes; ☐ intolerant;

Beta Blocker ☐ no; ☐ yes; ☐ intolerant;

Other Antiplatelet ☐ no; ☐ yes; ☐ intolerant;

Carotid Artery Stent - Follow-up

Last Name:		First Name:		DOB:	
MRN:		SSN:		Zip/Postal Code:	
Visit Code:		Surgeon:		Surgery Date:	
				Side:	

General Information

Date of Contact

Contact By ☐ Office Visit; ☐ Phone; ☐ Refused follow-up visit; ☐ Lost to follow-up;

Current Smoking ☐ No; ☐ Yes (within last 6 months);

Current Living Status ☐ Home; ☐ Nursing Home; ☐ Dead;

Date of Death

Cause ☐ Operation Related; ☐ Non-Related ☐ Unsure;

Current Medications

ASA ☐ No; ☐ Yes; ☐ Intolerant;

Plavix ☐ No; ☐ Yes; ☐ Intolerant;

Coumadin ☐ No; ☐ Yes; ☐ Intolerant;

Beta Blocker ☐ No; ☐ Yes; ☐ Intolerant;

Statin ☐ No; ☐ Yes; ☐ Intolerant;

Carotid Artery Stent

Ipsilat Neurologic Event ☐ No; ☐ TIA ☐ Stroke, minor; ☐ Stroke, major;

Date of Event

Contralat Neurologic Event ☐ No; ☐ TIA ☐ Stroke, minor; ☐ Stroke, major;

Date of Event

Duplex CAS Site ☐ <50%; ☐ >50%; ☐ >60%; ☐ >70%; ☐ >80% ☐ occluded; ☐ not done; ☐ unknown;

CAS Site RE-Intervention ☐ No; ☐ Yes;

Date of PTA/Stent

CAS Site Endarterectomy ☐ No; ☐ Yes;

Date of Procedure

v 1.9

CAROTID ARTERY STENT DEFINITIONS (Include only carotid bifurcation or internal carotid artery stents) v.01.09

If more than one response applies, select the most severe (highest number) response for each data field.

Pre-op

Smoking: Prior = quit ≥ 1 year ago. Current = still smoking within last 12 months. Include cigarettes, pipe, or cigar.

HTN (Hypertension): Defined as ≥ 140/90, either systolic or diastolic, at admission or within last 6 months, or clearly documented in medical record.

Beta-blockers: Peri-operative = started w/in one month before surgery or during surgery. Chronic = >than one month before surgery.

Symptoms (Coronary artery disease**):** Stable angina = stable pattern or symptoms with or without antianginal medication. Unstable angina = new onset, increasing frequency, lasting > 20 min and/or rest angina.

CABG/PTCA: Coronary artery bypass, angioplasty, or stent.

CHF (Congestive Heart Failure): Documented CHF: Mild = SOB on exertion; Severe = SOB at rest, pulmonary edema, or pitting ankle edema. (Use 2 = mild if severity not documented.)

COPD: Not treated = COPD documented in record but not treated with medication. Meds include theophylline, aminophylline, inhalers or steroids

Dialysis: Transplant = patient has functioning kidney transplant; Dialysis = currently on hemo- or peritoneal dialysis.

Creatinine: Last available measurement taken before procedure. If multiple measurements, use highest within 30 days of surgery.

Stress Test: Includes stress EKG, stress echo, nuclear stress scans, within 2 years of surgery.

Pre-admin living: Use last living status before any current, acute hospitalization or rehab unit.

Previous Arterial:

Bypass - Any non-cardiac arterial bypass for occlusive disease

CEA - Carotid endarterectomy

Aneurysm Repair – Any known true arterial aneurysm repair (excluding cerebral or pseudo-aneurysm)

PTA/Stent – Of any non-cardiac artery

Major Amputation – Any amputation above the foot or hand

Pre-Op Medications: Taken within 36 hours of surgery. Statins include any HMG-CoA reductase inhibitor, such as Lipitor, Mevacor, Pravachol, Zocor, Lescol, etc. If Plavix is disontinued prior to surgery it should be coded = 0.

Pre-op Hemoglobin: Most recent pre-op hemoglobin within past 30 days.

Symptoms: Ocular: unilateral visual loss or major blurring, etc. Cortical: unilateral motor and/or memory loss, or dysphagia/aphasia, etc. Vertebrobasiliar: bilateral motor, sensory, or visual loss, diplopia, ataxaia, etc. Major cortical or vertebrobasilar stroke = disability causing non-independent living status. Minor stroke is non-disabling. Major ocular stroke = blindness, otherwise minor. Stroke<1 month means stroke within previous month before surgery, etc. TIA=transient ischemic attack completely resolved within 24 hours.

Non-specific: Not clearly a carotid or vertebrobasilar TIA, e.g., light-headedness, dizziness

Ipsilat stroke on CT/MRI: Carotid territory only.

Medical high risk: At least one factor required: > 80 years old, severe O2 dependent pulmonary disease, CHF w/in one month, or abnormal stress test.

Anatomic high risk: Previous endarterectomy, previous neck surgery or radiation, tracheal or pharyngeal stoma, lesion above C3, contralat laryngeal nerve palsy, or contralateral carotid occlusion.

Refused for surgery: Surgeon has evaluated patient and refuses to operate due to excessive risk.

ICA stenosis: Use most severe category by modality thought to be most accurate if multiple modalities used.

Procedure

Urgency: Urgent = surgery within 24 hrs of admit or patient can't be discharged; emergent = surgery within 6 hrs of admission.

Lesion length: Length of stenosis intended to be covered with stent.

Prophylactic Anti-bradyarrhythmic: Atropine or Glycopyrolate given prior to angioplasty

Pre-dilate before protection device: Angioplasty required in order to cross lesion with a protection device.

Proximal CCA stent: Stent placement in the origin of the CCA.

Bradyarrhythmia requiring tx: Any dose given post post-dilation.

Technical failure: Can't complete procedure – CAS procedure defined as starting with attempting to place long sheath into CCA.

Protection device failure: Can't cross lesion, filter clogged, difficulty removing filter, ICA spasm requiring treatment, neurological change during procedure.

Post-op

Cranial nerve injury: Any occurrence, transient or persisting: VII-facial droop or more severe; IX-swallowing difficulty unless other diagnosis confirmed; X- hoarseness unless laryngoscopy normal; XII-any tongue deviation or dis-coordination

Ipsilat/Contralat neurologic event: Cerebral or ocular. TIA = cortical or ocular symptoms <24hrs duration. Major cortical or vertebrobasilar stroke = disability causing non-independent living status. Otherwise, minor. Major ocular stroke = blindness, otherwise minor. Minor stroke is non-disabling.

Time of Onset Ipsila/Contralat: Time when first noticed, but if noted on awakening from anesthesia code as 1=intra-op. Use 2=≤6 hrs post-op if normal at completion of procedure, and then neurologic event developed.

2b3a Inhibitor: Integrilin, Aggrastat.

Reperfusion Symptoms: Seizures associated with headache, or hemorrhage on CT/MRI.

IV meds required: Indicates continuous infusion or more than one dose required more than one hour after surgery.

Myocardial Infarction: Troponin: by local standards for MI. EKG: new Q waves, new ST and T wave changes. Clinical: documentation of MI by clinical criteria or ECHO or other imaging modality.

Dysrhythmia: New rhythm disturbance requiring treatment with medications or cardio-version.

CHF: Pulmonary edema with requirement for monitoring or treatment in ICU.

Access site cx: Complications at puncture site. PA=pseudo-aneurysm.

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 #:** 1548 **NQF Project:** Surgery Endorsement Maintenance 2010
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** Surveillance after Endovascular Abdominal Aortic Aneurysm Repair (EVAR)
De.2 **Brief description of measure***:* Percentage of patients 18 years of age or older undergoing endovascular abdominal aortic aneurysm repair who have at least one follow-up imaging study after 3 months and within 15 mos of EVAR placement that documents aneurysm sac diameter and endoleak status. This measure is proposed for individual providers.
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:** Population health, Safety De.5 **IOM Quality Domain**: Effectiveness, Efficiency, Safety De.6 **Consumer Care Need:** Staying healthy

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:** Agreement With Measure Stewards_Agreement	**A** Y☐ N☐

Between_National Quality Forum (12-6-2010).pdf	
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:** Public reporting, Internal quality improvement Accountability, Payment incentive	**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:** Frequently performed procedure, Leading cause of morbidity/mortality, High resource use, Patient/societal consequences of poor quality 1a.2 1a.3 **Summary of Evidence of High Impact:** Despite the overall success rate of EVAR, there are multiple publications demonstrating the potential failure of endograft therapy. Wyss et al. just published a manuscript entitled "Rate and predictability of graft rupture after endovascular and open abdominal aortic aneurysm repair: data from the EVAR Trials4." The authors describe 27 ruptures that occurred in EVAR patients (in 848 treated) as compared to 0 ruptures in 594 patients treated with open surgery. Five ruptures occurred in the first 30 days after surgery. The risk of rupture increased in the setting of an identified problem (endoleak type 1, type 2 with sac expansion, type 3, migration or kinking). The authors concluded that few ruptures after EVAR seem to be spontaneous without complications identified during optimal surveillance. Brown and colleagues also published some concerning findings in regards to EVAR and initial anatomy5. Elective EVAR was performed in 756 patients. Over almost four years of follow-up, 179 serious graft complications occurred (rate 6.5 per 100 person years) and 114 reinterventions (rate 3.8 per 100 person years) were needed. The highest rate of complication was during the first 6 months. In addition, graft-related complication and reintervention rates were common after EVAR in patients with a large	**1a** C☐ P☐ M☐ N☐

aneurysm. The data from these two publications stress the need for CT imaging within one year of EVAR.

Persistent type 2 endoleak treatment is controversial. But, persistent type 2 endoleak can lead to complications of EVAR therapy. Jones et al. identified 164 patients with a type 2 endoleak on the initial CT scan performed within 30 days of treatment6. The majority of these endoleaks resolved on follow-up imaging, but 33 persisted. Persistent type 2 endoleak was associated with an increased incidence of adverse outcomes, including aneurysm sac growth, the need for conversion to open repair, reintervention rate, and rupture in their paper. Therefore, these data suggest that patients with persistent type 2 endoleak (>6 months) should be considered for more frequent follow-up.

When can surveillance be minimized in the setting of possible EVAR failure? Houballah et al. described the rate of significant sac retraction after EVAR7. SSR was observed in 24.8% (92/371) of the patients after an average of 26 ± 21 months of FU. In this series, SSR was accurately predictive of a durable success after EVAR. It occurred mostly in patients with a favorable anatomy. But, the percentage of patients was low. This data also suggests that failure can occur in a large number of patients unless surveillance is performed. This surveillance must include asessmane of AAA sac diameter and determination of endoleak status by imaging (CT,MR or ultrasound).

Current Surveillance Paradigms

The goal of aneurysm repair, whether open or endovascular is to prevent rupture. With EVAR, there is an ongoing risk of endoleak and/or migration which can lead to re-pressurization of the residual aneurysm sac and renew the possibility of subsequent rupture. Therefore, post-EVAR surveillance is necessary for monitoring of these complications. Current recommendations for post-EVAR surveillance include contrasted CT scans and four view abdominal radiographs at 1, 6, and 12 months and then annually thereafter. These recommendations were derived from early clinical trials without substantial data. A recent trial looking at surveillance for a single device found that if at 30 days there was absence of endoleak, 92 % of those patients remained free of aneurysm related morbidity at 1 year and the 6 month surveillance studies did not correlate with any difference in 5 year freedom from aneurysm related morbidity.8 As a result of their findings, the authors recommended continued aggressive surveillance for patients with endoleak present at 30 days but even in those without endoleak, a CT scan at one year was still recommended. In a separate study Go et al9 looked at the utility of the 6 month CT scan in those patients with a normal CT scan at 1 month. In the 130 people who underwent CT scan at 6 month only two were abnormal. However among those who did and did not undergo 6 month CT scan (n=332), 11 had abnormal CT scans at 1 year. Therefore they recommended a CT at 1 month and if normal, eliminating the 6 month CT, but continuing to obtain the 1 year CT. As stated previously, the goal of EVAR is to prevent aneurysm rupture. In a literature search study looking at rupture after EVAR, Schlosser et al10 identified 270 ruptures reported in the literature and found that the majority of them occurring within the first 3 years. As a result, they also concluded that surveillance should focus on the first few years post EVAR.

Although CTA is considered the "gold standard" for followup, patients with renal insufficiency cannot safely receive contrast for CTA, so endoleak status must be determined by duplex ultasound or dynamic MRA.

1a.4 Citations for Evidence of High Impact:

1. Prinssen M, Verhoeven EL, Buth J, et al. A randomized trial comparing conventional and endovascular repair of abdominal aortic aneurysms. N Engl J Med. 2004 Oct 14;351(16):1607-18.
2. Greenhalgh RM, Brown LC, Kwong GP, et al. Comparison of endovascular aneurysm repair with open repair in patients with abdominal aortic aneurysm (EVAR trial 1), 30-day operative mortality results: randomised controlled trial. Lancet. 2004 Sep 4-10;364(9437):843-8.
3. Lederle FA, Freischlag JA, Kyriakides TC, et al. Outcomes following endovascular vs open repair of abdominal aortic aneurysm: a randomized trial. JAMA. 2009 Oct 14;302(14):1535-42.
4. Wyss TR, Brown LC, Powell JT, Greenhalgh RM. Rate and predictability of graft rupture after endovascular and open abdominal aortic aneurysm repair: data from the EVAR Trials. Ann Surg. 2010 Nov;252(5):805-12.
5. Brown LC, Greenhalgh RM, Powell JT, et al. Use of baseline factors to predict complications and reinterventions after endovascular repair of abdominal aortic aneurysm.
Br J Surg. 2010 Aug;97(8):1207-17.

6. Jones JE, Atkins MD, Brewster DC, et al. Persistent type 2 endoleak after endovascular repair of abdominal aortic aneurysm is associated with adverse late outcomes. J Vasc Surg. 2007 Jul;46(1):1-8. Epub 2007 Jun 1.

7. Houbballah R, Majewski M, Becquemin JP. Significant sac retraction after endovascular aneurysm repair is a robust indicator of durable treatment success. J Vasc Surg. 2010 Oct;52(4):878-83. Epub 2010 Jul 17.

8. Sternbergh WC, Greenberg RK, Chuter AM, et al. Redefining Postoperative Surveillance after Endovascular Aneurysm Repair: Recommendations based on 5-year follow-up in the US Zenith Multicenter Trial. J Vasc Surg. 2008. 48:2, 278-285.

9. Go MR, Barbato JE, Rhee RY et al. What is the Clinical Utility of a 6-month Computed Tomography in the Follow-up of Endovascular Aneurysm Repair Patients? J Vasc Surg. 47:6, 1181-1187.

10. Schlosser FJV, Gusberg RJ, Dardik A, et al. Aneurysm Rupture after EVAR: Can the Ultimate Failure be Predicted? Eur J of Vasc Endo Surg. 37, 15-22.

1b. Opportunity for Improvement

1b.1 **Benefits (improvements in quality) envisioned by use of this measure:** By ensuring follow-up within the first year after EVAR this measure will reduce the number of complications including rupture after EVAR placement and thus reduce morbidity and mortality after EVAR. The time window has been set at 15 months to allow for minor variation in when patients return for one year followup. The minimum time interval has been set as >3mo to insure that followup occurs beyond the typical 30-day followup point.

1b.2 **Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Non-published data for inappropriate endograft surveillance exists from two major medical centers. This data is in the process of being published in peer-reviewed journals. Both centers are high-volume, well-respected hospitals that care for many patients with abdominal aortic aneurysms. One center had a 50% rate of endograft surveillance and the other center had a compliance rate of 75%. This data demonstrate the need for more compliance with endograft surveillance.

1b.3 **Citations for data on performance gap:**
artiles are in press, have been peer reviewed by members of the SVS Measures Committee

1b.4 **Summary of Data on disparities by population group:**
None currently available. Such data will become available if this measure is adopted for reporting and used by more centers with more varied population demographics than found in the New England region.

1b.5 **Citations for data on Disparities:**
None

1b
C☐
P☐
M☐
N☐

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*)**:** As explained above, surveillance is critical to determine need for reintervention, which is required in 15-20% of patients, to avoid subsequent AAA rupture and death. Incrasing sac size and endoleak are the best predictors of the need for reintervention. This measure is designed to report compliance with recommended surveillance studies after EVAR.

1c.2-3. **Type of Evidence:** Cohort study, Evidence-based guideline, Expert opinion

1c.4 **Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
As described above, endoleak and sac dia increase are the best predictors of subsequent need for reintervention and late rupture.

1c.5 **Rating of strength/quality of evidence** (*also provide narrative description of the rating and by whom*)**:**
Guidelines of Society for Vascular Surgery

1c
C☐
P☐
M☐
N☐

1c.6 Method for rating evidence: Expert opinion. **1c.7 Summary of Controversy/Contradictory Evidence:** The only controversy about surveillance after EVAR is which type of imaging modality should be used at exactly which interval. We have eliminated this controversy by including any of the imaging modalities at a broad time frame of 3-15 months. There is no debate that some imaging is required in every case during this interval. **1c.8 Citations for Evidence (*other than guidelines*):** Wyss TR, Brown LC, Powell JT, Greenhalgh RM. Rate and predictability of graft rupture after endovascular and open abdominal aortic aneurysm repair: data from the EVAR Trials. Ann Surg. 2010 Nov;252(5):805-12. **1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number*):** Followup imaging surveillance is mandatory after EVAR (See citation below for pages) **1c.10 Clinical Practice Guideline Citation:** Clinical practice guidelines for endovascular abdominal aortic aneurysm repair: written by the Standards of Practice Committee for the Society of Interventional Radiology and endorsed by the Cardiovascular and Interventional Radiological Society of Europe and the Canadian Interventional Radiology Association. Walker TG, Kalva SP, Yeddula K, Wicky S, Kundu S, Drescher P, d´Othee BJ, Rose SC, Cardella JF; Society of Interventional Radiology Standards of Practice Committee; Interventional Radiological Society of Europe; Canadian Interventional Radiology Association. J Vasc Interv Radiol. 2010 Nov;21(11):1632-55 **1c.11 National Guideline Clearinghouse or other URL:** None **1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*):** NA **1c.13 Method for rating strength of recommendation (*If different from USPSTF system, also describe rating and how it relates to USPSTF)*:** NA **1c.14 Rationale for using this guideline over others:** There are no competing guidelines.	
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-specs** **C☐** **P☐** **M☐** **N☐**
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 18 years or older undergoing EVAR who have at least one follow-up CTA, duplex, or MRA of the	

abdomen and pelvis after 3 months but within 15 months of placement, assessing for sac size and endoleak

2a.2 Numerator Time Window (*The time period in which cases are eligible for inclusion in the numerator***):**
Lifetime for provider reporting

2a.3 Numerator Details (*All information required to collect/calculate the numerator, including all codes, logic, and definitions***):**
A registry that includes surgical details or CPT procedure codes is required to identify patients for numerator inclusion, and this registry must link the original operation with outpatient followup information. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries records such information. Patients undergoing EVAR, recorded in the registry (CPT codes 34800, 34802, 34803, 34804, 34805, 34825, 34826, 34900) who undergo CTA, MRA, or duplex imaging completed after 3 months but within 15 months of the original procedure with documentation of aneurysm sac size and presence or absence of endoleak as recorded in an appropriate registry during a subsequent physician office visit that is linked to the original procedure.

2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured***):**
Patients 18 years or older undergoing EVAR for abdominal aortic aneurysms excluding patients who died prior to follow-up within 15 months postoperatively.

2a.5 Target population gender: Female, Male
2a.6 Target population age range: 18 years or older

2a.7 Denominator Time Window (*The time period in which cases are eligible for inclusion in the denominator***):**
Lifetime for provider reporting

2a.8 Denominator Details (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
A registry that includes surgical details or CPT procedure codes is required to identify patients for denominator inclusion. This registry must also collect followup data based on an outpatient visit that links to the original EVAR procedure and documents aneurysm sac size and endoleak status based on an outpatient imaging study (CT, MR or ultrasound). The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries record this information. CPT codes that define the initial cohort of EVAR operations include: 34800, 34802, 34803, 34804, 34805, 34825, 34826, and 34900.

2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population***):** Death of patient as recorded in registry before followup imaging could be obtained during the first 15 months after EVAR. The Society for Vascular Surgery Vascular Quality Initiative (SVS VQI) and the Vascular Study Group of New England (VSGNE) registries record this information.

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Patients who died before imaging could be obtained within 15 months of original operation, as recorded in an appropriate registry that links outpatient followup information with the original EVAR procedure.

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

2a.12-13 Risk Adjustment Type: No risk adjustment necessary

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
None needed for this process measure.

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***):**
Patients undergoing EVAR who have CTA, MRA, or duplex with AAA sac diameter and endoleak status recorded in registry after 3 months but within 15 months of EVAR / (All patients undergoing EVAR - EVAR patients who have died before imaging could be obtained within 15 months of EVAR)

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
Standard statistical comparison of rates to provide confidence levels to discriminate meaningful differences from the mean.

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)*:
NA

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

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.***):**
Society for Vascular Surgery Vascular Quality Initiative Registry
New Vascular Study Group of New England Registry

2a.26-28 Data source/data collection instrument reference web page URL or attachment: Attachment Endo_AAA_Repair_v1.9-634367278132053234.xls

2a.29-31 Data dictionary/code table web page URL or attachment: Attachment EVAR defs v.01.09-634367278260803234.doc

2a.32-35 Level of Measurement/Analysis (*Check the level(s) for which the measure is specified and tested)*
Clinicians: Individual, Clinicians: Group, Can be measured at all levels

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Ambulatory Care: Office

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

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)***:** A random sample of 100 patient records representing 5 procedures relevant to the measure from 5 different hospitals based on data collected during the past 2 years. In addition, a random sample of 20 patients with one year followup was selected and outpatient office records were reviewd.

2b.2 Analytic Method *(type of reliability & rationale, method for testing)***:**
A nurse abstractor completed a form based on medical record review for the variables relevant to this measure. The results of this chart review were then compared with the original registry data. The Kappa statistic was used to judge reliability of the data.

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
The key variables for this measure and testing results were:

1. Correct procedure (EVAR of abdominal aortic aneurysm) performed. Kappa =1.0
2. Imaging (MR, CT, or duplex) obtained with endoleak status and sac diameter recorded recorded. Kappa = 1.0.
3. Death within 15 months before imaging could be obtained. Kappa=1.0.

2b
C ☐
P ☐
M ☐
N ☐

2c. Validity testing

2c.1 **Data/sample** *(description of data/sample and size)*: See reliability testing

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
The valididty testing of imaging obtained between 3 and 15 months after EVAR used the the imaging report document as the gold standard. Correctness of operation type compared the operative report as the gold standard with the progress note in the medical record. We compared the rates with published literature.

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
100% agreement was found between the imaging document and the outpt record and the registry data that documented endoleak status and aneurysm sac size. Aneurysm sac size measurements were accurate (56.5 mm imaging report, 56.6 mm registry (mean, no significant difference). 100% agreement was also found between the procedure type reported in the operative note and that recorded in the daily progress notes.

We could not find recorded data in the literature regarding the rate of performance of imaging within 15 months of EVAR, but VSGNE data analysis shows that this is recorded for 85% of living patients after EVAR, which ideally should be 100%.

2c C☐ P☐ M☐ N☐

2d. Exclusions Justified

2d.1 **Summary of Evidence supporting exclusion(s):**
Patients who died within 15 months before imaging cannot be included in the calculation since no imaging data are available.

2d.2 **Citations for Evidence:**
face validity

2d.3 **Data/sample** *(description of data/sample and size)*: In VSGNE there were 1,135 primary EVAR procedures performed from 2003-2009.

2d.4 **Analytic Method** *(type analysis & rationale)*:
Calculation of measure rates

2d.5 **Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:
Of the 1135 EVAR patients, 87% had followup, but only 67% had followup between 3-15 months postop. Of patients who had followup, across 9 centers, the median rate of imaging for sac diameter and endoleak was 90%, with an interquartile range of 87% to 91%. Among 41 surgeons, the median rate of imaging for sac diameter and endoleak was 93%, with an interquartile range of 86% to 100%.

2d C☐ P☐ M☐ N☐ NA☐

2e. Risk Adjustment for Outcomes/ Resource Use Measures

2e.1 **Data/sample** *(description of data/sample and size)*: Not needed for this process measure.

2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*:

2e.3 **Testing Results** *(risk model performance metrics)*:

2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:**

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)*: see section 1.b.3 and above 2,d,5

2f.2 **Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:

2f C☐ P☐ M☐ N☐

Standard statistial analysis to determine 95% confidence interval for hospitals and providers to determine practical difference from mean 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)*: see above 2,d,5	
2g. Comparability of Multiple Data Sources/Methods 2g.1 **Data/sample** *(description of data/sample and size)*: no other data sources available 2g.2 **Analytic Method** *(type of analysis & rationale)*: 2g.3 **Testing Results** *(e.g., correlation statistics, comparison of rankings)*:	**2g** C☐ P☐ M☐ N☐ NA☐
2h. Disparities in Care 2h.1 **If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: NA 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*): Data from SVS VQI and VSGNE are reported to each hospital and provider in a format that can be transmitted to an appropriate public reporting mechanism. 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*): Vascular Study Group of New England www.vsgne.org Data have been successfully collected in this quality registry since 2003, and reports provided to participating physicians and hospitals about their rates of outcomes. These results are used by the regional quality group to provide benchmark reporting, and to stimulate regional quality improvement projects. **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)*: VSGNE samples previously described 3a.5 **Methods** *(e.g., focus group, survey, QI project)*:	**3a** C☐ P☐ M☐ N☐

Semi-annual meetings of providers in VSGNE 3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*: Benchamrk reports of this process measure have been provided to VSGNE member physician and hospitals since 2003, and discussed at semi-annual meetings. There have been no questions about interpretability.	
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 same target population), Describe why it is a more valid or efficient way to measure quality:**	**3c** C☐ P☐ M☐ N☐ NA☐
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?**	**4c** C☐ P☐ M☐

No **4c.2 If yes, provide justification.**	**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.** Although imaging may be done in other institutions, it is the responsibility of the treating surgeon to monitor EVAR patients long term because of the potential need for reintervention to prevent AAA rupture. Thus, this information (a report of the imaging study) needs to be available in the surgeons office. Thus, there is little chance for error in this measure.	**4d C☐ P☐ M☐ N☐**
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:** We have found followup data for patients in the VSGNE registry in >85% of patients undergoing EVAR, at a mean time interval of 12.8 months after surgery. We believe that this quality measure will further improve the rate of followup, which should be 100%. **4e.2 Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** Hospitals participating in the SVS VQI or VSGNE registries have no additional costs to report this measure. **4e.3 Evidence for costs:** **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** Society for Vascular Surgery, 633 N. St. Clair, 22nd floor, Chicago, Illinois, 60611 **Co.2 Point of Contact** Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-	
Measure Developer If different from Measure Steward **Co.3 Organization**	

Society for Vascular Surgery, 633 N. St. Clair, 22nd floor, Chicago, Illinois, 60611 Co.4 **Point of Contact** Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-
Co.5 **Submitter If different from Measure Steward POC** Sarah, Murphy, Staff, smurphy@vascularsociety.org, 312-334-2305-, Society for Vascular Surgery
Co.6 **Additional organizations that sponsored/participated in measure development** N/A
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.**
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:** 2010 Ad.7 **Month and Year of most recent revision:** 12, 2010 Ad.8 **What is your frequency for review/update of this measure?** Ad.9 **When is the next scheduled review/update for this measure?**
Ad.10 **Copyright statement/disclaimers:**
Ad.11 -13 **Additional Information web page URL or attachment:**
Date of Submission (*MM/DD/YY*)**:** 03/27/2011

Vascular Quality Initiative - Endo AAA Repair

Last Name | First Name | Middle Initial

Date of Birth | Medical Record Number | Social Security Number

General Information

Patient Data

Zip/Postal Code

Ethnicicty: ☐ Not Hispanic or Latino; ☐ Hispanic or Latino

Height: ☐ inches or cm

Weight: ☐ lbs or kg

Gender: ☐ male; ☐ female

Race: ☐ White; ☐ Black or African American; ☐ Asian; ☐ More than 1 race; ☐ American Indian or Alaskan Native; ☐ Native Hawaiian or other Pacific Islander; ☐ Unknown/other

Admission Data

Visit code (not required)

Admit Date

Surgeon

Discharge Status: ☐ home; ☐ rehab unit; ☐ nursing home; ☐ dead; ☐ other hospital; ☐ skilled nursing facility

If dead, date of death

Tranfered from?: ☐ no; ☐ hospital; ☐ rehab unit

Discharge Date

Surgery Date

Does the patient have Medicare Part B?: ☐ no; ☐ yes

Demographics

Smoking: ☐ never; ☐ prior (>1 yr); ☐ current (within yr)

Diabetes: ☐ none; ☐ diet; ☐ oral meds; ☐ insulin

CAD symptoms: ☐ none; ☐ hx MI but no sx; ☐ stable angina; ☐ unstable angina or MI < 6 mos

CHF: ☐ none; ☐ asymp, hx CHF; ☐ mild; ☐ severe

Dialysis: ☐ no; ☐ functioning transplant; ☐ on dialysis

Stress Test: ☐ normal; ☐ (+) ischemia; ☐ (+) MI; ☐ (+)both; ☐ not done

ASA Class: ☐ 1 normal/healthy; ☐ 2 w/mild systemic dx; ☐ 3 w/severe systemic dx; ☐ 4 w/severe systemic dx that is a constant threat to life; ☐ 5 moribund, not expectd to survive w/o op

Hypertension: ☐ no; ☐ yes (>=140/90 or history)

Beta blockers: ☐ no; ☐ op day only; ☐ pre-op 1-30 days; ☐ chronic >30 days; ☐ no-intolerant

CABG/PTCA: ☐ none; ☐ <5yr; ☐ >=5yrs ago

COPD: ☐ no; ☐ not treated; ☐ on meds; ☐ on home oxygen

Creatinine: ☐ mg/dl OR µmol/L

Pre-adm Living: ☐ home; ☐ nursing home

Pre-op Hemoglobin: ☐ g/dl OR g/L

Previous arterial

Bypass: ☐ no; ☐ yes

Aneurysm Repair: ☐ no; ☐ yes

Major Amp: ☐ no; ☐ yes

CEA: ☐ no; ☐ yes

PTA/Stent: ☐ no; ☐ yes

Pre-Op Medications

ASA: ☐ no; ☐ yes; ☐ intolerant

Statin: ☐ no; ☐ yes; ☐ intolerant

Plavix: ☐ no; ☐ yes; ☐ intolerant

History

Family History of AAA: ☐ no; ☐ yes

Ejection Fraction: ☐ <30%; ☐ 30-50%; ☐ >50%; ☐ not done; ☐ unknown

Iliac Aneurysm: ☐ no; ☐ unilateral; ☐ bilateral

Urgency: ☐ elective; ☐ symptomatic; ☐ ruptured

Prior Aortic Surgery: ☐ none; ☐ AAA; ☐ SAAA; ☐ bypass; ☐ other

Maximum AP AAA Diam: ☐ mm

Maximum Diameter: ☐ mm

Fill out the fields below if Urgency equals ruptured.

Lowest pre-intubation BP: ☐ Systolic- mmHg

Cardiac Arrest: ☐ no; ☐ yes

Time: Admission to Incision: ☐ hours

Mental Status: ☐ normal; ☐ disoriented; ☐ unconscious

Time: Symptoms to Incision: ☐ hours

Abdomen Explored: ☐ no; ☐ yes

Procedure

Unfit for Open AAA Repair: ☐ no; ☐ yes

Graft Type: ☐ AneurRx; ☐ Excluder; ☐ Talent; ☐ Zenith; ☐ Powerlink; ☐ Endurant; ☐ Aorfix; ☐ Unifit; ☐ Zenith Low Profile; ☐ Aptus; ☐ Other;

Unfit for gen. anesthesia: ☐ no; ☐ yes

Graft Configuration: ☐ aorto-bi-iliac; ☐ aorto-uni-iliac right; ☐ aorto-uni-iliac left; ☐ aorto-aortic

Anesthesia: ☐ local; ☐ regional; ☐ general

Total Procedure Time: ☐ minutes

Depends on Graft Configuration:

Graft Body Diameter: ☐ mm

Right Limb Diameter: ☐ mm

Depends on Graft Configuration:

Left Limb Diameter: ☐ mm

Hypogastric Intentionally Covered: ☐ none; ☐ unilateral; ☐ bilateral

Hypogastric Unintentionally Covered: ☐ none; ☐ unilateral; ☐ bilateral

Skin Prep: ☐ chlorhexadine; ☐ alcohol; ☐ iodine; ☐ chlor+iodine; ☐ chlor+alcohol; ☐ iodine+alcohol; ☐ all 3

Arterial Injury: ☐ no; ☐ femoral; ☐ iliac; ☐ renal; ☐ aorta; ☐ multiple

If Arterial Injury: Intervention: ☐ none; ☐ stent/PTA; ☐ stent-graft; ☐ open repair

Endoleak at Completion: ☐ no; ☐ attachment site(type I); ☐ branch(type II); ☐ mid graft(type III); ☐ indeterminate

Conversion to Open: ☐ no; ☐ yes;

If yes, Reason (If yes, also complete an Open AAA Form): ☐ unable to deploy appropriately; ☐ endoleak; ☐ rupture

Iodinated Contrast: ☐ ml

EBL: ☐ ml

Crystalloid: ☐ ml

PRBC (in OR): ☐ units (during the procedure)

Heart Rate

On Arrival in OR: ☐ bpm

Highest intra-op: ☐ bpm

Procedure (continued)

Concomitant Procedure

Hypogastric Coil Pre-Op	☐ no; ☐ unilateral; ☐ bilateral	Hypogastric Coil Intra-Op	☐ no; ☐ unilateral; ☐ bilateral	Unplanned Graft Extension	☐ no; ☐ yes
Femoral Endarterectomy	☐ no; ☐ yes	Fem-Fem Bypass	☐ no; ☐ yes	Ilio-Femoral Bypass	☐ no; ☐ yes
Thromboembolectomy	☐ no; ☐ yes	Iliac Angioplasty	☐ no; ☐ yes	Iliac Stent Placement	☐ no; ☐ yes
Renal PTA/Stent	☐ no; ☐ yes	Other Arterial Reconstruction	☐ no; ☐ planned; ☐ arterial injury		

Post-Op Data

Time to Extubation	☐ in OR; ☐ <12 hrs; ☐ 12-24 hrs; ☐ >=24 hrs	Vasopressors Req. Post-Op	☐ no; ☐ yes	ICU Stay	☐ days
Myocardial Infarction	☐ no; ☐ troponin only; ☐ EKG or clinical	Dysrhythmia (new)	☐ no; ☐ yes	CHF	☐ no; ☐ yes
Respiratory	☐ no; ☐ pneumonia; ☐ ventilator	Change of Renal Function	☐ none; ☐ creat. increase > 0.5 mg/dl (44.2 µmol/L); ☐ temp. dialysis; ☐ permanent dialysis	Leg Ischemia/Emboli	☐ no; ☐ yes, rx w/o surgery; ☐ required surgery; ☐ amputation
Bowel Ischemia	☐ no; ☐ treated conservatively; ☐ return to OR	Wound Complication	☐ no; ☐ superficial separation/infection; ☐ return to OR	Transfusion # Units PRBC	☐ # of units
Return to OR	☐ no ☐ yes	If yes, Bleeding	☐ no; ☐ yes		
Stroke	☐ none; ☐ minor; ☐ major ☐				

Discharge Medications

ASA	☐ no; ☐ yes; ☐ intolerant ☐	Statin	☐ no; ☐ yes; ☐ intolerant ☐
Plavix	☐ no; ☐ yes; ☐ intolerant ☐	Beta Blocker	☐ no; ☐ yes; ☐ intolerant ☐

Peri-Op Antibiotic Ordered

Start <1hr Pre-op	☐ no; ☐ yes; ☐ no, for medical reason	Stop <24hr Post-op	☐ no; ☐ yes; ☐ no, for medical reason
1st-2nd Gen Cephalosporin	☐ no; ☐ yes; ☐ no, for medical reason		

Vascular Quality Initiative - Endo AAA Repair Follow-Up

Last Name:		First Name:		DOB:	
MRN:		SSN:		Zip/Postal Code:	
Visit Code:		Surgeon:		Surgery Date:	
				Side:	

General Information

Date of Contact

Contact By ☐ Office Visit ☐ Phone; ☐ Refused follow-up visit; ☐ Lost to follow-up

Current Smoking ☐ No; ☐ Yes (within last 6 months)

Current Living Status ☐ Home; ☐ Nursing Home; ☐ Dead

Date of Death

Cause ☐ Operation Related; ☐ Non-Related; ☐ Unsure

Current Medications

ASA ☐ No; ☐ Yes; ☐ Intolerant	Plavix ☐ No; ☐ Yes; ☐ Intolerant	Coumadin ☐ No; ☐ Yes; ☐ Intolerant	
Beta Blocker ☐ No; ☐ Yes; ☐ Intolerant	Statin ☐ No; ☐ Yes; ☐ Intolerant		

Endo AAA Repair

Current Max AAA Diameter mm

Number New Interventions

Current Endoleak ☐ No; ☐ Attachment site(type I); ☐ Branch(type II); ☐ Mid graft(type III); ☐ Indeterminate

Conversion to Open Repair ☐ No; ☐ Yes;

If yes, Date

Performed for:

Endoleak ☐ No; ☐ Yes;	Sac Growth ☐ No; ☐ Yes	Migration ☐ No; ☐ Yes;
Infection ☐ No; ☐ Yes;	Symptom Rupture ☐ No; ☐ Yes	
Other Op Related to Endo ☐ No; ☐ Yes;		

ENDOVASCULAR AAA DEFINITIONS– v.01.09

If more than one response applies, select the most severe (highest number) response for each data field.

Pre-op Data

Smoking: Prior = quit ≥ 1 year ago. Current = still smoking within last 12 months. Include cigarettes, pipe, or cigar.

HTN (Hypertension): Defined as ≥ 140/90, either systolic or diastolic, at admission or within last 6 months, or clearly documented in medical record.

Beta-blockers: Peri-operative = started within one month before surgery or during surgery. Chronic = more than one month before surgery.

CAD Symptoms (Coronary artery disease**):** Stable angina = stable pattern or symptoms with or without antianginal medication. Unstable angina = new onset, increasing frequency, lasting > 20 min and/or rest angina.

CABG/PTCA: Coronary artery bypass, angioplasty, or stent.

CHF (Congestive Heart Failure): Documented CHF: Mild = SOB on exertion; Severe = SOB at rest, pulmonary edema, or pitting ankle edema. (Use 2 = mild if severity not documented.)

COPD: Not treated = COPD documented in record but not treated with medication. Meds include theophylline, aminophylline, inhalers or steroids

Dialysis: Transplant = patient has functioning kidney transplant; Dialysis = currently on hemo- or peritoneal dialysis.

Creatinine: Last available measurement taken before procedure. If multiple measurements, use highest within 30 days of surgery.

Stress Test: Includes stress EKG, stress echo, nuclear stress scans, within 2 years of surgery.

Pre-admin living: Use last living status before any current, acute hospitalization or rehab unit.

Previous Arterial:

Bypass - Any non-cardiac arterial bypass for occlusive disease
CEA - Carotid endarterectomy
Aneurysm Repair – Any known true arterial aneurysm repair (excluding cerebral or pseudo-aneurysm)
PTA/Stent – Of any non-cardiac artery
Major Amputation – Any amputation above the foot or hand

Pre-Op Medications: Taken within 36 hours of surgery. Statins include any HMG-CoA reductase inhibitor, such as Lipitor, Mevacor, Pravachol, Zocor, Lescol, etc. If Plavix is discontinued prior to surgery it should be coded = 0.

Pre-op Hemoglobin: Most recent pre-op hemoglobin within past 30 days.

Family history of AAA: First-degree relative (parents, sibling, aunt, uncle, child)

Prior Aortic Surgery: AAA = infrarenal aneurysm repair. SAAA = Suprarenal aneurysm repair. Bypass = A-1 or A-F for occlusive disease. Other = endarterectomy or other.

Ejection Fraction: Left ventricular ejection fraction (%), by Echo, nuclear scan, or cath estimate, within 6 months

Maximum AP AAA diameter: Largest AP diameter. If AP not specified, use largest diameter. If multiple imaging modalities, use most accurate in following hierarchy: CT>MRI>Echo>arteriogram.

Iliac aneurysm: Iliac diameter > 1.5 cm. Use maximum diameter of largest iliac artery, common or internal.

Procedure

Urgency: Symptomatic = surgery within 24 hours of pain and/or tenderness without rupture. Ruptured = CT or angio evidence of rupture.

Unfit for open AAA repair: Endovascular repair performed because patient was considered too high risk by surgeon for open repair, i.e., mandatory endovascular repair.

Unfit for general anesthesia: Local or regional anesthesia used because patient was considered too high risk by surgeon or anesthesiologist for general anesthesia, i.e., mandatory regional/local anesthesia.

Anesthesia: Local includes IV sedation. Regional = epidural or spinal

Graft Diameter: Body size = diameter of most proximal portion of graft. Limb size = diameter of distal most graft or extension.

Hypogastric covered: Intentionally = planned prior to procedure to treat distal aneurysm extent. Unintentionally = inadvertent extension of graft not necessary to treat distal aneurysm extent.

Endoleak: Attachment site [type I] = proximal or distal attachment site leak. Branch [type II] = retrograde filling of sac via lumbars, IMA, or accessory renals. Mid-graft [type III] = filling of sac via leak at component overlap sites or fabric tear.

Conversion to open: If yes, give reason. If yes, use Open AAA form also.

Total procedure time: From incision to closure.

Concomitant Procedure

Arterial Injury: Requiring intervention or resulting in occlusion. Use 5=multiple if > 1 site.

Ruptured AAA Repairs Only

Lowest pre-intubation BP: After arrival at hospital (lowest prior to intubation)

Mental status: Normal alert and oriented; Disoriented to person, place, or time.

Abdomen explored: To evacuate hematoma but not to repair rupture (use OPEN AAA Repair form for conversion to open repair.)

Post-op Data

Time to extubation: In OR; otherwise, beginning upon departure from OR

Vasopressors required post-op: Dopamine≥5mcg/kg/min, or neosynephrine, levophed, epinephrine, vasopressin, or other IV vasopressor during hospitalization.

ICU stay: Any portion of 24 hours = 1 day.

Transfusion: Total of all PRBC transfusions pre-op, intra-op, and post-op during this hospitalization.

Myocardial Infarction: Troponin: by local standards for MI. EKG: new Q waves, new ST and T wave changes. Clinical: documentation of MI by clinical criteria or ECHO or other imaging modality.

Dysrhythmia: New rhythm disturbance requiring treatment with medications or cardioversion.

CHF: Pulmonary edema with requirement for monitoring or treatment in ICU.

Respiratory: Pneumonia = Lobar infiltrate on CXR and pure growth of recognized pathogen or 4+ growth of recognized pathogen in presence of mixed growth. Ventilator = required after initially extubated (if applicable).

Change renal function: New increase in creatinine of 0.5mg/dl. New dialysis includes peritoneal dialysis, hemodialysis, and hemo-filtration. (Applies to dialysis only if not required pre-op.)

Leg ischemia/emboli: Loss of previously palpable pulses, loss of previously present Doppler signals, decrease of >0.15 in ABI, or blue toe.

Bowel ischemia: Diagnosed by colonoscopic evidence of ischemia, bloody stools in a patient who dies prior to colonoscopy or laparotomy, or presumptive diagnosis with conservative treatment.

Peri-operative Antibiotics: Use 0=no if antibiotic was not ordered. To use 1=yes, antibiotic must be ordered to be given within 1 hour prior to skin incision and must be ordered to be discontinued within 24 hrs of end of time of operation. To use 2=no for medical reason, a medical reason must be documented in the chart that antibiotic not given. **Acceptable antibiotics include:** Ampicilin/sulbactam, Aztreonam, Cefazolin, Cefmetazole, Cefotetan, Cefuroxime, Ciprofloxacin, Clindamycin, Ertapenem, Erythromycin base, Gatifloxacin, Gentamicin, Levofloxacin, Metronidazole, Moxifloxacin, Neomycin, and Vancomycin.

1st-2nd Generation Cepahalosporin: (Cefazolin or Cefuroxime) Use response 1=yes, if ordered. If documented in medical record that not ordered for medical reason use 2. Otherwise use 0=no.