



Measure Information

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

Brief Measure Information

NQF #: 2513

Corresponding Measures:

De.2. Measure Title: Hospital 30-Day All-Cause Risk-Standardized Readmission Rate (RSRR) following Vascular Procedures

Co.1.1. Measure Steward: Centers for Medicare & Medicaid Services

De.3. Brief Description of Measure: This measure estimates hospital risk-standardized 30-day unplanned readmission rates following hospital stays with one or more qualifying vascular procedure in patients who are 65 years of age or older and either admitted to the hospital (inpatients) for their vascular procedure(s) or receive their procedure(s) at a hospital but are not admitted as an inpatient (outpatients). Both scenarios are hereafter referred to as "hospital stays."

1b.1. Developer Rationale: The goal of this measure is to improve patient outcomes by providing patients, physicians, and hospitals with information about hospital-level, risk-standardized readmission rates following vascular procedures. Measurement of patient outcomes allows for a broad view of quality of care that encompasses more than what can be captured by individual process-of-care measures. Complex and critical aspects of care, such as communication among providers, prevention of and response to complications, patient safety, and coordinated transitions to the outpatient environment, all contribute to patient outcomes but are difficult to measure by individual process measures. A goal of outcomes measurement is to risk adjust for patients' conditions at the time of hospital admission and then evaluate patient outcomes. This measure was developed to identify hospitals whose performance is better or worse than would be expected based on their patient mix, and therefore promote hospital quality improvement and better inform consumers about care quality.

S.4. Numerator Statement: The outcome for this measure is 30-day all-cause unplanned readmission following a qualifying index hospital stay (see S.7-S.11 for more details). We define a readmission as a subsequent hospital inpatient admission within 30 days of either the discharge date (for inpatients) or claim end date (for outpatients – hereafter referred to as "discharge date") following a qualifying hospital stay. We do not count as readmissions any subsequent outpatient procedures or any subsequent admissions which are identified as "staged" or planned. If a patient has more than one unplanned readmission within 30 days of discharge from the index hospital stay, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each index hospital stay has an unplanned readmission within 30 days. (See S.6, Numerator Details, for more information.)

S.6. Denominator Statement: The target population for this measure includes inpatient and outpatient hospital stays for patients at least 65 years of age who receive one or more qualifying vascular procedure.

S.8. Denominator Exclusions: Hospital stays are excluded from the cohort if they met any of the following criteria:

1) Lack of follow-up in Medicare FFS for at least 30 days post-discharge. Hospital stays for patients without at least 30 days of enrollment in Medicare FFS after discharge from the index stay are excluded.

Rationale: We exclude these hospital stays because the 30-day readmission outcome cannot be assessed in this group.

2) Hospital stays for patients who leave hospital against medical advice (AMA). Hospital stays for patients who are discharged AMA are excluded.

Rationale: We exclude hospital stays for patients who are discharged AMA because providers in these circumstances do not have the opportunity to deliver full care and prepare the patient for discharge.

3) Hospital stays with a qualifying vascular procedure that occur within 30 days of a previous hospital stay with a qualifying vascular procedure. Subsequent hospital stays with a qualifying vascular procedure within 30 days of discharge from an index hospital stay will not be counted as another index hospital stay.

Rationale: Qualifying vascular procedures occurring within 30 days of discharge from an index hospital stay fall within the 30-day readmission assessment period during which no new hospital stay can be counted as an index hospital stay. They are considered readmissions. Any vascular hospital stay is either an index stay or a potential readmission, but not both.

De.1. Measure Type: Outcome

S.17. Data Source: Claims

S.20. Level of Analysis: Facility

IF Endorsement Maintenance – Original Endorsement Date: Dec 23, 2014 Most Recent Endorsement Date: Dec 09, 2016

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

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

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? This measure is not included in a composite or paired with another measure.

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

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

1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form

[Yale-CORE_Vascular_Measure_Evidence_attachment_FINAL_02-05-14.docx](#)

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

Do not remove any existing information. If there have been any changes to evidence, the Committee will consider the new evidence. Please use the most current version of the evidence attachment (v7.1). Please use red font to indicate updated evidence.

1b. Performance Gap

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

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

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

If a COMPOSITE (e.g., combination of component measure scores, all-or-none, any-or-none), *SKIP this question and answer the composite questions.*

The goal of this measure is to improve patient outcomes by providing patients, physicians, and hospitals with information about hospital-level, risk-standardized readmission rates following vascular procedures. Measurement of patient outcomes allows for a broad view of quality of care that encompasses more than what can be captured by individual process-of-care measures. Complex and critical aspects of care, such as communication among providers, prevention of and response to complications, patient safety, and coordinated transitions to the outpatient environment, all contribute to patient outcomes but are difficult to measure by individual process measures. A goal of outcomes measurement is to risk adjust for patients' conditions at the time of hospital admission and then evaluate patient outcomes. This measure was developed to identify hospitals whose performance is better or worse than would be expected based on their patient mix, and therefore promote hospital quality improvement and better inform consumers about care quality.

1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. (*This is required for maintenance of endorsement. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.*) This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.

Data for this measure come from qualifying hospital stay stays between January 1, 2009 and December 31, 2010. There were 502,293 hospital stays at 2,870 hospitals.

Distribution of Hospital RSRRs 2009-2010 (only hospitals with at least 25 cases)

Number of hospitals:	1,926
Mean (SD):	13.6% (1.1)
Minimum:	10.3
10th percentile:	12.3
20th percentile:	12.7
Q1	12.9
30th percentile:	13.0
40th percentile:	13.3
Median:	13.5
60th percentile:	13.8
70th percentile:	14.1
Q3:	14.3
80th percentile:	14.4
90th percentile:	14.9
Maximum:	18.9

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

The 2007 MedPAC Report to Congress identified "other vascular" as one of the seven conditions which account for nearly 30% of potentially preventable readmissions within 15 days following discharge with an 11.7% rate of preventable readmissions in 2005 following these procedures. These conditions were responsible for \$182 million in spending on readmissions (MedPAC 2007).

Variation in readmission rates indicates opportunity for improvement. We conducted analyses using 2009-2010 Medicare claims data and reported a range in RSRRs across 2,870 hospitals from 10.2% to 18.9%.

Report to the Congress: Promoting Greater Efficiency in Medicare: Medicare Payment Advisory Commission (MedPAC); 2007.

1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability. (*This is required for maintenance of endorsement. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included.*) For measures that show high levels of performance, i.e., "topped out", disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.

We combined the 2009 and 2010 calendar year Medicare datasets. This dataset included 502,293 qualifying hospital stays. In 54.8% of the hospital stays, the patient was male. The average age of the patients during hospital stays was 76.5 years.

We conducted analyses to explore disparities by socioeconomic status (SES) and race at the hospital level. We used Medicaid eligibility status identified in the Medicare claims EDB as a proxy for SES. This approach is consistent with prior research as well as NQF recommendations (http://www.qualityforum.org/projects/Patient_Outcome_Measures_Phases1-2.aspx). Hospitals were categorized into quintiles based on their proportion of dual eligible patients, with the lowest and highest quintile consisting of hospitals with lower and higher proportion of dual eligible patients, respectively. Analyses demonstrated that median RSRRs and the distributions of RSRRs were consistent across quintiles. This analysis suggests that that many hospitals with a high proportion of dual eligible patients can and do perform well on the measure.

Similar analyses were conducted for the proportion of African-American patients in hospitals that showed that the median RSRRs were consistent across quintiles of hospitals based on the hospital proportion of African-American patients. Similarly, the distributions were overlapping. This indicates that hospitals with high proportion of African-American patients can perform as well on the measure as hospitals with lower proportion of African-American patients.

Consistent with NQF guidelines, this measure does not risk-adjust for race or SES.

#2513 Hospital 30-Day All-Cause Risk-Standardized Readmission Rate (RSRR) following Vascular Procedures, Last Updated: Nov 09, 2020

Distribution of Vascular RSRRs across quintiles by proportion of Medicaid patients over different time periods for hospitals with at least 25 index hospital stays in the study period:

Year	Dataset A: 2009				
Quintile	1	2	3	4	5
# of hospitals		331	331	331	331
% Medicaid LL		0.16	11.8	16.5	19.7
% Medicaid UL		11.8	16.5	19.6	24.1
Max		17.0	16.8	17.4	16.5
90%		14.6	14.6	14.6	14.7
Q3		13.9	14.0	13.9	14.1
Median		13.3	13.3	13.4	13.5
Q1		12.7	12.8	12.9	13.0
10%		12.2	12.3	12.3	12.4
Min		11.1	10.9	10.8	11.4

Year	Dataset R: 2010				
Quintile	1	2	3	4	5
# of hospitals		326	327	327	326
% Medicaid LL		0.1	11.6	16.4	19.7
% Medicaid UL		11.6	16.4	19.7	24.2
Max		17.1	17.0	16.6	17.6
90%		14.7	14.8	14.7	15.0
Q3		14.2	14.2	14.2	14.3
Median		13.6	13.5	13.5	13.7
Q1		13.0	13.0	13.0	13.2
10%		12.5	12.5	12.6	12.7
Min		10.9	11.2	11.0	10.8

Distribution of Vascular RSRRs across quintiles by proportion of African-American (AA) patients over different time periods for hospitals with at least 25 index hospital stays in the study period:

Year	Dataset A: 2009				
Quintile	1	2	3	4	5
# of hospitals		334	334	331	337
% AA patients LL 0.0		0.6	2.8	6.7	14.5
% AA patients UL 0.6		2.8	6.6	14.5	100.0
Max		16.7	16.2	17.4	17.4
90%		14.3	14.5	14.8	14.8
Q3		13.7	13.9	14.0	14.1
Median		13.3	13.3	13.4	13.5
Q1		12.8	12.8	12.8	12.9
10%		12.2	12.2	12.3	12.3
Min		11.2	10.8	11.1	11.3

Year	Dataset R: 2010				
Quintile	1	2	3	4	5
# of hospitals		329	331	330	331
% AA patients LL 0.0		0.6	2.9	6.9	14.6
% AA patients UL 0.6		2.9	6.9	14.6	97.7
Max		16.2	17.6	17.6	17.4
90%		14.4	15.0	15.0	15.1
Q3		14.0	14.2	14.3	14.4

Median	13.4	13.6	13.7	13.8	13.9
Q1	12.9	13.0	13.1	13.2	13.3
10%	12.5	12.6	12.5	12.6	12.7
Min	11.0	10.8	11.4	10.9	11.2

*LL = Lower Limit, UL = Upper Limit

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

The published medical literature on disparities in care among vascular surgery patients has mixed results. One study of over 9,000 patients that underwent an elective carotid endarterectomy (CEA), in which 87% of patients were white and the rest were nonwhite, found racial disparities in initial CEA use, but found that whites and nonwhites had similar CEA readmission rates (Kennedy 2007). Another study using Medicare data for men 65 years and older undergoing elective or urgent abdominal aortic aneurysm (AAA) repair reported racial disparities in rate of AAA repair (elective and urgent) after accounting for differences in disease prevalence (Wilson 2008).

Kennedy BS, Fortmann SP, Stafford RS. Elective and isolated carotid endarterectomy: health disparities in utilization and outcomes, but not readmission. J Natl Med Assoc. May 2007;99(5):480-488.

Wilson CT, Fisher E, Welch HG. Racial disparities in abdominal aortic aneurysm repair among male Medicare beneficiaries. Arch Surg. May 2008;143(5):506-510.

2. Reliability and Validity—Scientific Acceptability of Measure Properties

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

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

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

Surgery : Vascular Surgery

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

Care Coordination, Care Coordination : Readmissions, Care Coordination : Transitions of Care, Safety : Complications

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

Elderly, Populations at Risk

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

N/A

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

This is not an eMeasure Attachment:

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

Attachment Attachment:

S.2c. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales, etc.)? Attach copy of instrument if available.

Attachment:

S.2d. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales, etc.)? Attach copy of instrument if available.

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

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

N/A

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

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

The outcome for this measure is 30-day all-cause unplanned readmission following a qualifying index hospital stay (see S.7-S.11 for more details). We define a readmission as a subsequent hospital inpatient admission within 30 days of either the discharge date (for inpatients) or claim end date (for outpatients – hereafter referred to as "discharge date") following a qualifying hospital stay. We do not count as readmissions any subsequent outpatient procedures or any subsequent admissions which are identified as "staged" or planned. If a patient has more than one unplanned readmission within 30 days of discharge from the index hospital stay, only the first one is counted as a readmission. The measure looks for a dichotomous yes or no outcome of whether each index hospital stay has an unplanned readmission within 30 days. (See S.6, Numerator Details, for more information.)

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

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

Readmissions captured in the measure include any inpatient hospitalization to an acute care hospital within 30 days of discharge from the index hospital stay, unless that readmission is identified as "planned."

To the extent possible, we do not count as readmissions hospital stays associated with "planned" procedures. We identify planned procedures using the CMS Planned Readmission Algorithm Version 3.0 (developed for the Hospital-Wide All-Cause Unplanned Readmission Measure, NQF #1789), with modifications for vascular patients. In brief, the algorithm identifies readmissions with a diagnosis or procedure that is considered "always planned" (for example, major organ transplant or maintenance chemotherapy), as well as those readmissions with a "potentially planned" procedure (for example, total hip replacement or cholecystectomy).

Additionally, since physicians caring for patients with vascular disease may opt to "stage" procedures across multiple hospital stays, we further identify vascular procedures which might be considered part of a planned series of admissions. An admission for a vascular procedure may be part of a planned: (1) same-procedure pair, (2) different-procedure pair, or (3) amputation procedure. The list of codes in each of these types of scenarios is included in the attached appendix (2014 Measure Updates Memorandum).

One example of a potentially planned different-procedure pair is a readmission for a peripheral vascular shunt or bypass (International Classification of Diseases, Ninth Revision [ICD-9] 39.29) which follows an index admission for an insertion of non-drug-eluting, non-coronary artery stent (ICD-9 39.90). For these scenarios only, the index hospital stay and readmission must be at the same hospital. It should also be noted that for scenarios (1) and (2) only, only readmissions which follow an index inpatient hospital

stay, as opposed to an outpatient hospital stay, may be considered "potentially planned."

Any readmission that is considered "potentially planned" will be considered unplanned if the principal discharge diagnosis for the readmission is acute. We consider acute diagnoses to be complications of care, and not indicative of a planned procedure.

Any unplanned readmission within 30 days of discharge from an index hospital stay may be counted in the numerator of this measure, regardless of whether the patient had a planned readmission within 30 days of discharge from the index hospital stay.

Full detail, including lists of procedures and diagnoses, are included in the 2014 Measure Updates Memorandum in the attached appendix.

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

The target population for this measure includes inpatient and outpatient hospital stays for patients at least 65 years of age who receive one or more qualifying vascular procedure.

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

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

The index cohort includes inpatient or outpatient hospital stays for patients at least 65 years of age who received one or more qualifying vascular procedure at the hospital. Hospital stays are eligible for inclusion in the denominator if they contained a qualifying vascular procedure, the patient had continuous enrollment in Medicare fee-for-service (FFS) one year prior to the index hospital stay, the patient was not transferred to another acute hospital stay, and the patient was alive at discharge. Procedures on veins, procedures on cardiac and intracranial arteries, and procedures addressing vascular access for hemodialysis, do not qualify for inclusion in the cohort as they represent hospital stays for patient populations distinct from those intended for inclusion in the measure, with differing risks for readmission. Additionally, hospital stays associated with a primary discharge diagnosis of ICD-9 code 996.73 (other complications due to renal dialysis device implant and graft) are not included in the cohort.

This cohort is defined using the ICD-9 procedure codes identified in Medicare Part A inpatient and outpatient claims data and Medicare Part A outpatient Current Procedural Terminology (CPT) codes.

For purposes of risk adjustment, hospital stays are assigned to procedure groups based on anatomic location and whether an open surgical or endovascular procedure was performed, as described in item S.14 below. Qualifying ICD-9 and CPT procedure codes listed by anatomic group and procedure type are listed in the attached Excel file (see tab S.9).

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

Hospital stays are excluded from the cohort if they met any of the following criteria:

1) Lack of follow-up in Medicare FFS for at least 30 days post-discharge. Hospital stays for patients without at least 30 days of enrollment in Medicare FFS after discharge from the index stay are excluded.

Rationale: We exclude these hospital stays because the 30-day readmission outcome cannot be assessed in this group.

2) Hospital stays for patients who leave hospital against medical advice (AMA). Hospital stays for patients who are discharged AMA are excluded.

Rationale: We exclude hospital stays for patients who are discharged AMA because providers in these circumstances do not have the opportunity to deliver full care and prepare the patient for discharge.

3) Hospital stays with a qualifying vascular procedure that occur within 30 days of a previous hospital stay with a qualifying vascular procedure. Subsequent hospital stays with a qualifying vascular procedure within 30 days of discharge from an index hospital stay will not be counted as another index hospital stay.

Rationale: Qualifying vascular procedures occurring within 30 days of discharge from an index hospital stay fall within the 30-day readmission assessment period during which no new hospital stay can be counted as an index hospital stay. They are considered

readmissions. Any vascular hospital stay is either an index stay or a potential readmission, but not both.

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

Denominator exclusions are identified based on variables contained in the Standard Analytic File (SAF) or Enrollment Database (EDB). Of note, a hospital stay may satisfy multiple exclusion criteria.

1) Lack of follow-up in Medicare FFS for at least 30 days post-discharge is determined by patient enrollment status in both Part A and Part B and in FFS using the CMS EDB; the enrollment indicators must be appropriately marked for any month which falls within 30 days of hospital discharge or enrollment end date (this does not apply for patients who die within 30 days of the index hospital stay).

2) Hospital stays for patients who leave hospital against medical advice (AMA) are identified using the discharge disposition indicator in the SAF.

3) Subsequent qualifying vascular procedures within 30 days of discharge from an index hospital stay are determined using the ICD-9 procedure codes in the Inpatient SAF and the CPT procedure codes in the Outpatient Department SAF.

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

Results of this measure will not be stratified.

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

Statistical risk model

If other:

S.12. Type of score:

Rate/proportion

If other:

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

Better quality = Lower score

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

The RSRR is calculated as the ratio of the number of "predicted" to the number of "expected" readmissions, multiplied by the national unadjusted readmission rate. For each hospital, the numerator of the ratio ("predicted") is the number of readmissions within 30 days predicted on the basis of the hospital's performance with its observed case mix, and the denominator ("expected") is the number of readmissions expected on the basis of the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital's performance given its case mix to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission or better quality, and a higher ratio indicates higher-than-expected readmission or worse quality.

The predicted hospital outcome (the numerator) is the sum of predicted probabilities of readmission for all patients at a particular hospital. The predicted probability of each patient in that hospital is calculated using the hospital-specific intercept and patient risk factors. The expected number of readmissions (the denominator) is the sum of expected probabilities of readmission for all patients at a hospital. The expected probability of each patient in a hospital is calculated using an average intercept and patient risk factors.

Please see the 2011 Measure Methodology Report (section 2.8) in the appendix for more details on the calculation algorithm.

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

IF an instrument-based performance measure (e.g., PRO-PM), identify whether (and how) proxy responses are allowed.

N/A –This measure is not based on a sample or survey.

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

Specify calculation of response rates to be reported with performance measure results.

N/A –This measure is not based on a sample or survey.

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

If other, please describe in S.18.

Claims

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

IF instrument-based, identify the specific instrument(s) and standard methods, modes, and languages of administration.

Administrative claims

We obtained data on index hospital stays, readmissions, and comorbidities from Medicare's SAF. Index hospital stays are derived from Medicare Part A inpatient and outpatient data. Readmissions are assessed using Part A inpatient data. Comorbidities are derived using Part A inpatient, outpatient, and Part B office visit Medicare claims in the 12 months prior to and during the index hospital stay. Enrollment status is obtained from Medicare's EDB, which contains beneficiary demographic and benefit/coverage information.

1. 2009 and 2010 Part A inpatient data - index and 12 months pre-index

Part A data includes claims for Medicare inpatient admission, skilled nursing facility care, some home health agency services, and hospice care. For purposes of this project, Part A inpatient data is used to refer to inpatient services only and includes data from two time periods:

- a. Index hospital stay: Index hospital stay data are based on the inclusion/exclusion criteria for vascular procedures, and comorbidities (if any) are identified from the secondary diagnoses associated with the index hospital stay.
- b. Pre-index: 12 months prior to the index hospital stay.

2. 2009 and 2010 Part A outpatient data – index and 12 months pre-index

Part A outpatient data refers to Medicare claims paid for the facility component of surgical or diagnostic procedures, emergency room care, and other non-inpatient services performed in a hospital outpatient department or ambulatory surgical/diagnostic center during the following two time periods:

- a. Index hospital stay: Index hospital stay data are based on the inclusion/exclusion criteria for vascular procedures, and comorbidities (if any) are identified from the secondary diagnoses associated with the index hospital stay.
- b. Pre-index: 12 months prior to the index hospital stay.

3. Part B data – 12 months pre-index

Part B data refers to Medicare claims for the services of physicians (regardless of setting) and other outpatient care, services, and supplies. For purposes of this project, Part B services include only face-to-face encounters between a care provider and patient. We thus do not include services such as laboratory tests, medical supplies, or other ambulatory services.

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

No data collection instrument provided

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

Facility

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

Inpatient/Hospital

If other:

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

N/A

2. Validity – See attached Measure Testing Submission Form

[Yale-CORE_Vascular_Measure_Testing_attachment_FINAL_02-05-14.docx](#)

2.1 For maintenance of endorsement

Reliability testing: If testing of reliability of the measure score was not presented in prior submission(s), has reliability testing of the measure score been conducted? If yes, please provide results in the Testing attachment. Please use the most current version of the testing attachment (v7.1). Include information on all testing conducted (prior testing as well as any new testing); use red font to indicate updated testing.

2.2 For maintenance of endorsement

Has additional empirical validity testing of the measure score been conducted? If yes, please provide results in the Testing attachment. Please use the most current version of the testing attachment (v7.1). Include information on all testing conducted (prior testing as well as any new testing); use red font to indicate updated testing.

2.3 For maintenance of endorsement

Risk adjustment: For outcome, resource use, cost, and some process measures, risk-adjustment that includes social risk factors is not prohibited at present. Please update sections 1.8, 2a2, 2b1,2b4.3 and 2b5 in the Testing attachment and S.140 and S.11 in the online submission form. NOTE: These sections must be updated even if social risk factors are not included in the risk-adjustment strategy. You MUST use the most current version of the Testing Attachment (v7.1) -- older versions of the form will not have all required questions.

3. Feasibility

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

3a. Byproduct of Care Processes

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

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

[Coded by someone other than person obtaining original information \(e.g., DRG, ICD-9 codes on claims\)](#)

If other:

3b. Electronic Sources

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

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

[ALL data elements are in defined fields in electronic claims](#)

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

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

Attachment:

3c. Data Collection Strategy

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

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

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

Administrative data are routinely collected as part of the billing process.

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

There are no fees associated with the use of this measure.

4. Usability and Use

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

4a. Accountability and Transparency

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

4.1. Current and Planned Use

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

Specific Plan for Use	Current Use (for current use provide URL)
Public Reporting	
Not in use	

4a1.1 For each CURRENT use, checked above (update for maintenance of endorsement), provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included
- Level of measurement and setting

N/A; measure is not currently in use.

4a1.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)

This measure is not currently publicly reported or used in an accountability application because it has only recently completed development and is being submitted to NQF for initial endorsement.

4a1.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (*Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.*)

CMS is considering use of this measure in public reporting.

4a2.1.1. Describe how performance results, data, and assistance with interpretation have been provided to those being measured or other users during development or implementation.

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

4a2.1.2. Describe the process(es) involved, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.

4a2.2.1. Summarize the feedback on measure performance and implementation from the measured entities and others described in 4d.1.

Describe how feedback was obtained.

4a2.2.2. Summarize the feedback obtained from those being measured.

4a2.2.3. Summarize the feedback obtained from other users

4a2.3. Describe how the feedback described in 4a2.2.1 has been considered when developing or revising the measure specifications or implementation, including whether the measure was modified and why or why not.

Improvement

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

4b1. Refer to data provided in 1b but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included.)

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

The measure is not currently used in a quality improvement program, but a primary goal of the measure is to provide hospitals with procedure-specific information necessary to implement focused quality improvement.

This measure has been evaluated by a group of clinical experts and a technical expert panel (TEP) throughout the measure development process. We have received input and feedback on key methodological, clinical, and other measure decisions, as well as on its utility in guiding focused quality improvement within hospitals.

4b2. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for

individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

4b2.1. Please explain any unexpected findings (positive or negative) during implementation of this measure including unintended impacts on patients.

No unintended negative consequences were identified during testing.

4b2.2. Please explain any unexpected benefits from implementation of this measure.

5. Comparison to Related or Competing Measures

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

5. Relation to Other NQF-endorsed Measures

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

Yes

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

0330 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following heart failure (HF) hospitalization

0505 : Hospital 30-day all-cause risk-standardized readmission rate (RSRR) following acute myocardial infarction (AMI) hospitalization.

0506 : Hospital 30-day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization

0695 : Hospital 30-Day Risk-Standardized Readmission Rates following Percutaneous Coronary Intervention (PCI)

1551 : Hospital-level 30-day risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)

1768 : Plan All-Cause Readmissions (PCR)

1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

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

5a. Harmonization of Related Measures

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

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

Are the measure specifications harmonized to the extent possible?

No

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

The proposed vascular readmission measure is harmonized with the above measures to the extent possible given the differences between clinical and administrative data. With the exception of the Plan All-Cause Readmissions (PCR) measure, the NQF-endorsed readmission measures use administrative claims from the same underlying population, and they use a similar development and modeling strategy. However, the PCR measure is specified for age 18 and over, and the proposed vascular readmission measure is currently specified for age 65 and over. The proposed vascular readmission measure is harmonized with the above measures to the extent possible given the different data sources used for development and reporting. We did not include in our list of related

measures any non-outcome (e.g., process) measures with the same target population as our measure. Our measure cohort was heavily vetted by clinical experts, a technical expert panel, and a public comment period. Because this is an outcome measure, clinical coherence of the cohort takes precedence over alignment with related non-outcome measures. Furthermore, non-outcome measures are limited due to broader patient exclusions. This is because non-outcome measures typically only include a specific subset of patients who are eligible for that measure (for example, patients who receive a specific medication or undergo a specific procedure).

5b. Competing Measures

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

OR

Multiple measures are justified.

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

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

N/A

Appendix

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

Attachment **Attachment:** [Yale-CORE_Vascular_Measure_Appendix_to_NQF_Submission_FINAL_02-05-14.pdf](#)

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): Centers for Medicare & Medicaid Services

Co.2 Point of Contact: Helen, Dollar-Maples, Helen.Dollar-Maples@cms.hhs.gov, 410-786-7214-

Co.3 Measure Developer if different from Measure Steward: Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (CORE)

Co.4 Point of Contact: Lori, Geary, Lori.geary@yale.edu, 203-764-5700-

Additional Information

Ad.1 Workgroup/Expert Panel involved in measure development

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

Working Group

Role: To provide technical expertise on key methodological decisions during measure development.

Members:

Susannah Bernheim, MD

Associate Director, Quality Measures, YNHHS/CORE

Jeptha Curtis, MD

Associate Professor of Medicine (Cardiovascular Medicine), Yale School of Medicine

Alan Dardik, MD, PhD

Associate Professor of Surgery (Vascular), Yale School of Medicine

Chief, Peripheral Vascular Surgery, VA Connecticut

Lori Geary, MPH
Co-Lead, Project Manager for Quality Measures, YNHHS/CORE

Shu-Xia Li, PhD
Lead Analyst, YNHHS/CORE

Zhenqiu Lin, PhD
Consulting Project Analyst, YNHHS/CORE

Robert McNamara, MD, MHS
Co-Lead, YNHHS/CORE
Cardiologist; Associate Professor of Medicine (Cardiovascular Medicine), Yale School of Medicine

Julia Montague, MPH
Project Coordinator, YNHHS/CORE

Smitha Vellanky, MSc
Research Assistant, YNHHS/CORE

Haiyan Wang, MD, MS
Supporting Analyst, YNHHS/CORE

Technical Expert Panel
Role: To provide feedback on recommendations for measure development.

Members:

Terry Golash, MD
Senior Medical Director, Aetna

Bruce Hall, MD, PhD, MBA
Professor of Surgery and Healthcare Management, Washington University Saint Louis

Jeffrey Indes, MD
Assistant Professor of Surgery and Radiology, Section of Vascular Surgery, Yale University School of Medicine

Sanjay Misra, MD
Associate Professor of Radiology, Mayo Clinic

Leila Mureebe, MD
Assistant Professor of Surgery; Attending Surgeon, Duke University Medical Center

Ileana L. Piña, MD, MPH
Professor of Medicine & Professor of Epidemiology/Biostatistics, Case Western Reserve University

Anne Roberts, MD
Professor of Radiology; Chief of Vascular and Interventional Radiology, University of California, San Diego

Sean P. Roddy, MD
Health Policy Committee Chair, Society for Vascular Surgery

John Santa, MD, MPH
Director, Consumer Reports Health Ratings Center

#2513 Hospital 30-Day All-Cause Risk-Standardized Readmission Rate (RSRR) following Vascular Procedures, Last
Updated: Nov 09, 2020

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Medical School

Christopher J. White, MD
Chairman, Ochsner Clinic Foundation Department of Cardiology

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released:

Ad.3 Month and Year of most recent revision:

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

Ad.5 When is the next scheduled review/update for this measure?

Ad.6 Copyright statement:

Ad.7 Disclaimers:

Ad.8 Additional Information/Comments: