



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 #: 0133

Corresponding Measures:

De.2. Measure Title: In-Hospital Risk Adjusted Rate of Mortality for Patients Undergoing PCI

Co.1.1. Measure Steward: American College of Cardiology

De.3. Brief Description of Measure: Risk adjusted rate of mortality for all patients age 18 and over undergoing PCI.

1b.1. Developer Rationale: This measure allows benchmarking against the national aggregate and against hospitals with similar volume, so that hospitals with high mortality rates can engage in quality improvement to reduce mortality following PCI procedures. In-depth analysis of the causes behind variations in mortality during or post PCI can lead to the identification of best practices. Particularly actionable opportunities to improve care are to reduce peri-procedural bleeding rates and acute kidney injury, where operators have the option to pursue strategies that decrease these complications. In addition, detailed case reviews can identify operators with poorer performance for whom additional training or reduced caseloads could be considered. Active dissemination of those best practices and support to enable their adoption will improve outcomes and reduce variations in clinical practice. Improvements in the quality of care resulting from the evaluation of the risk for mortality, before and after implementing quality improvement interventions, can enable centers to quantify their improved outcomes with respect to peri-procedural mortality and a reduction in cost associated with these events. Additionally, by putting the responsibility for improved quality in the hands of physicians and other health-care practitioners, this risk-adjusted mortality measure engages the medical community around the common goal of better health-care value.

S.4. Numerator Statement: Patients 18 years of age and older with a PCI procedure performed during episode of care who expired

S.6. Denominator Statement: Patients 18 years of age and older with a PCI procedure performed during episode of care.

S.8. Denominator Exclusions: 1. NCDR Registry patients who did not have a PCI (Patient admissions with a diagnostic cath only during that admission);

2. Patient admissions with PCI who transferred to another facility on discharge

De.1. Measure Type: Outcome

S.17. Data Source: Registry Data

S.20. Level of Analysis: Facility

IF Endorsement Maintenance – Original Endorsement Date: May 09, 2007 **Most Recent Endorsement Date:** Jun 05, 2018

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? N/A

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

[0133_NQF_evidence_attachment_20171102.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.

No

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.

This measure allows benchmarking against the national aggregate and against hospitals with similar volume, so that hospitals with high mortality rates can engage in quality improvement to reduce mortality following PCI procedures. In-depth analysis of the causes behind variations in mortality during or post PCI can lead to the identification of best practices. Particularly actionable opportunities to improve care are to reduce peri-procedural bleeding rates and acute kidney injury, where operators have the option to pursue strategies that decrease these complications. In addition, detailed case reviews can identify operators with poorer performance for whom additional training or reduced caseloads could be considered. Active dissemination of those best practices and support to enable their adoption will improve outcomes and reduce variations in clinical practice. Improvements in the quality of care resulting from the evaluation of the risk for mortality, before and after implementing quality improvement interventions, can enable centers to quantify their improved outcomes with respect to peri-procedural mortality and a reduction in cost associated with these events. Additionally, by putting the responsibility for improved quality in the hands of physicians and other health-care practitioners, this risk-adjusted mortality measure engages the medical community around the common goal of better health-care value.

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.

2015 Data:

Data range date: Quarter 1 through Quarter 4, 2015

Number of patients: 699,049

Number of PCI procedures per hospital volume:

0-10: 5 hospitals; 35 Patients

11-200: 405 hospitals; 45826 Patients

201-400: 456 hospitals; 134174 Patients

401-600: 274 hospitals; 134305 Patients

601-1000: 260 hospitals; 197675 Patients

1001-2000: 138 hospitals; 180023 Patients

2001+: 15 hospitals; 35607 Patients

Deciles:

Mean: 1.95%

Stddev: 1.07%

Quartile 1: 1.33%

Quartile 3: 2.32%

Deciles of mortality adjusted rates:

1: 0.96%

2: 1.23%

3: 1.42%

4:1.59%
5(median): 1.76%
6: 1.95%
7: 2.17 %
8: 2.47%
9: 3.0%

In 2015, we observed a >3-fold variation in mortality rates from the lowest to highest decile; a significant opportunity to improve survival by an absolute percentage of 2.04% in the highest decile.

2016 Data:

Data range date: Quarter 1 through 4 2016

Number of patients: 722,029

Number of PCI procedures per hospital volume:

0-10: 10 hospitals; 34 Patients

11-200: 438 hospitals; 48342 Patients

201-400: 453 hospitals; 132373 Patients

401-600: 280 hospitals; 137916 Patients

601-1000: 278 hospitals; 210683 Patients

1001-2000: 147 hospitals; 193893 Patients

2001+: 12 hospitals; 29357 Patients

Adjusted Rate statistics:

Mean: 1.9%

Stddev: 1.06%

Quartile 1: 1.30%

Quartile 3: 1.76%

Deciles of mortality adjusted rates:

1: 0.92%

2: 1.2%

3: 1.41%

4:1.58%

5(median):1.76%

6: 1.95%

7: 2.15%

8: 2.45%

9: 2.96%

In 2016, we observed a >3-fold variation in mortality rates from the lowest to highest decile; a significant opportunity to improve survival by an absolute percentage of 2.04% in the highest decile. Collectively, these 2 years of data, supplemented with prior evidence of declining mortality rates with PCI, show that there have been progressive improvements in the safety of PCI over time. However, there have not been formal evaluations of strategies to move poorer performing sites to better performance. This is a demonstration for an opportunity for improvement based on the noted performance scores, but further efforts to decrease other complications of PCI, such as bleeding and acute kidney injury, are opportunities for further improving performance across the US.

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.

N/A

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.

See "0133_Main submission form supplement_20171108" (Attached in Appendix A1)

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

Finding minimal differences by patient characteristics, as compared with differences across deciles of hospital performance further supports the idea that hospital-focused quality improvement efforts, rather than patient-specific ones, are likely to have the greatest impact on improving the quality and safety of PCI. These findings also do not support the need to stratify the measure.

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):

Cardiovascular, Cardiovascular : Coronary Artery Disease (PCI)

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

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

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.)

<https://www.ncdr.com/webncdr/cathpci/home/datacollection>: ACC realizes the various NCDR endorsed measures are not readily available on their own main webpage. However, ACCF plans to update their main webpage (cardiosource.org)

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: [cathpci_v4_codersdictionary_4-4.pdf](#)

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.

No, this is not an instrument-based measure 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.

Not an instrument-based measure

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.

No

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.

No changes were made to the measure specification since the last endorsement.

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).

Patients 18 years of age and older with a PCI procedure performed during episode of care who expired

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).

PCI=yes

Coding instructions to identify patients in the numerator: indicate if the patient had a percutaneous coronary intervention (PCI)

Selection options: yes/no

Supporting definitions: PCI: A percutaneous coronary intervention (PCI) is the placement of an angioplasty guide wire, balloon, or other device (e.g. stent, atherectomy, brachytherapy, or thrombectomy catheter) into a native coronary artery or coronary bypass graft for the purpose of mechanical coronary revascularization. Source: NCDR

AND

Discharge status=deceased

Response options: Alive/deceased

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

Patients 18 years of age and older with a PCI procedure performed during episode of care.

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).

PCI=yes

Coding instructions for identifying the measure's denominator: indicate if the patient had a percutaneous coronary intervention (PCI); Selection options: yes/no

Supporting definitions: PCI: A percutaneous coronary intervention (PCI) is the placement of an angioplasty guide wire, balloon, or other device (e.g. stent, atherectomy, brachytherapy, or thrombectomy catheter) into a native coronary artery or coronary bypass graft for the purpose of mechanical coronary revascularization. Source: NCDR

AND

Age>=18: patients must be 18 years of age to be included in the registry.

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

1. NCDR Registry patients who did not have a PCI (Patient admissions with a diagnostic cath only during that admission);

2. Patient admissions with PCI who transferred to another facility on discharge

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.)

See coding instructions for defining a PCI in S.5, which also apply to the denominator. In addition, it is important to note that all data submissions must pass the data quality and completeness reports to be included. Note: If one or two variables are missing, the value is imputed for certain characteristics. In our data quality program, all key variables in the risk model have a high "inclusion" criteria. This means that, when a hospital submits data to us, they need to have a high level of completeness (around 95-99%) for those variables. If they are not able to meet the criteria in our data quality program, they do not receive risk-adjusted mortality for any of the records they submitted for that quarter.

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.)

N/A: We do not use univariate categorizations to apply the measure to subsets of the population. Rather, we use a statistical risk model to integrate all patient characteristics prior to calculating the outcome.

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

Other

If other: We have used hierarchical logistic regression to calculate the risks for peri-procedural mortality and use these data to create risk-standardized event rates.

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.)

1. Remove hospitals who fail data quality and completeness reports as outlined in the NCDR Data Quality Program (further discussed in the Testing Supplement and described in section S.9 above)

2. Count of admissions from data submissions that pass NCDR data inclusion thresholds.

3. Remove patient's subsequent PCIs during the same admission (if the patient had more than one PCI procedure during that admission). (Note: The measure consists of the first PCI in a hospital stay and subsequent PCI in that stay are not included in the denominator)

4. Remove admissions without PCI during admission

5. Remove patient admissions with PCI who transferred to another facility on discharge;

6. Calculate measure using weight system based on predictive variables as outlined in the accompanying testing documents and supplemental materials.

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

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

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

If other, please describe in S.18.

[Registry Data](#)

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.

[National Cardiovascular Data Registry Percutaneous Coronary Interventions](#)

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)

[Available at measure-specific web page URL identified in S.1](#)

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.)

2. Validity – See attached Measure Testing Submission Form

[0133_NQF_testing_attachment_20171102.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.

[No](#)

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.

[No](#)

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.

[Yes - Updated information is included](#)

3. Feasibility

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

3a. Byproduct of Care Processes

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

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

Generated or collected by and used by healthcare personnel during the provision of care (e.g., blood pressure, lab value, diagnosis, depression score), Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry)

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 clinical data (e.g., clinical registry, nursing home MDS, home health OASIS)

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).

ACC is in the process of developing a common data dictionary mapped to coded terminology standards with the intent of improving interoperability with EHRs and potentially creation of emeasures.

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.

Availability:

Participating hospitals report patient demographics, medical history, risk factors, hospital presentation, initial cardiac status, procedural details, medications, laboratory values and in-hospital outcomes as the key activity of participating in the NCDR CathPCI registry. The majority of the 17 required data elements are routinely generated and acquired during the delivery of standard cardiac care to this patient population. Electronic extraction of data recorded as part of the procedure expedites data collection. This strategy offers point of care data collection and minimizes time and cost. Institutions can manually report using a free web-based tool or automate the reporting by using certified software developed by third-party vendors. The data elements required for this measure are readily available within the patient's medical record or can be attained without undue burden by the hospital. Most data elements exist in a structured format within patient's electronic health record.

Sampling:

There is no sampling of patient data allowed within the contractual terms of participation in the NCDR CathPCI Registry. The registry is designed to include 100 percent of consecutive adult patients who undergo PCI at participating institutions. Section 2.b of the NCDR Master Agreement with participants includes 'Participant Responsibilities': "b. Use of ACCF Data Set and ACCF-Approved Software. Participant will submit a data record on each patient who receives medical care and who is eligible for inclusion in the Registries in which Participant is participating under this Agreement." Adult patients, ages 18 years and older, who undergo a diagnostic cardiac catheterization and/or PCI. Eligible diagnostic catheterizations are characterized by the passage of a catheter into the aortic root for pressure measurements and/or angiography, and can include Left Ventricle (LV) pressure measurements, LV angiography, coronary angiography, and coronary artery bypass angiography. Eligible PCI procedures include those that involve passage or attempted passage of a coronary device across one or more coronary lesions for purposes of increasing the intraluminal

diameter of the vessel and/or restoring or improving circulation. Patients are selected for inclusion by reviewing existing medical records and no direct interaction with the patient is required outside of the normal course of care. There is no discrimination or bias with respect to inclusion on the basis of sex, race, or religion.

Patient confidentiality:

Patient confidentiality is preserved as the data are analyzed in aggregate form without patient identifiers. The CathPCI Registry dataset, comprised of approximately 250 data elements and was created by a panel of experts using available ACC-AHA guidelines, data elements and definitions, and other evidentiary sources. Private health information (PHI), such as social security number, is collected. The intent for collection of PHI is to allow for registry interoperability and the potential for future generation of patient-level drill downs in Quality and Outcomes Reports. Registry sites can opt out of transmitting direct identifiers to the NCDR, enabling inclusion of direct identifiers in the registry to be at the discretion of the registry participants themselves. When using the NCDR web-based data collection tool, direct identifiers are entered but a partition between the data collection process and the data warehouse maintains the direct identifiers separate from the analysis datasets. The minimum level of PHI transmitted to the ACCF when a participant opts out of submitting direct identifiers meets the definition of a Limited Dataset as such term is defined by the Health Insurance Portability and Accountability Act of 1996. All analyses performed by contracted data analytic centers are devoid of direct patient identifiers.

Data collection within the NCDR conforms to laws regarding protected health information. Patient confidentiality is of utmost concern with all metrics. The proposed measure does not currently include a patient survey. Physician and/or institutional confidentiality is maintained by de-identified dashboard reports. There is no added procedural risk to patients through involvement in the CathPCI Registry. No testing, time, risk, or procedures beyond those required for routine care are imposed. The primary risk associated with this measure is the potential for a breach of patient confidentiality. The ACCF has established a robust plan for ensuring appropriate and commercially reasonable physical, technical, and administrative safeguards are in place to mitigate such risks, such as segregating all patient identifiable data from the analytic datasets provided to contracted data analytic centers.

Data are maintained on secure servers with appropriate safeguards in place. The project team periodically reviews all activities involving protected health information to ensure that such safeguards including standard operating procedures are being followed. The procedure for notifying the ACCF of any breach of confidentiality and immediate mitigation standards that need to be followed are communicated to participants. ACCF limits access to Protected Health Information, and to equipment, systems, and networks that contain, transmit, process or store Protected Health Information, to employees who need to access the PHI for purposes of performing ACCF's obligations to participants who are in a contractual relationship with the ACCF. All PHI are stored in a secure facility or secure area within ACCF's facilities which has separate physical controls to limit access, such as locks or physical tokens. The secured areas are monitored 24 hours per day, 7 days per week, either by employees or agents of ACCF by video surveillance, or by intrusion detection systems.

Each participant who has access to the NCDR website must have a unique identifier. The password protected webpages have implement inactivity time-outs. Encryption of wireless network data transmission and authentication of wireless devices containing NCDR Participant's information ACCF's network is required. Protected Health Information may only be transmitted off of ACCF's premises to approved parties, which shall mean: A subcontractor who has agreed to be bound by the terms of the Business Associate Agreement between the ACCF and the NCDR Participant.

Overall there is no added procedural risk to patients through their hospital's involvement in the CathPCI Registry. No testing, time, risk, or procedures beyond those required for routine care will be imposed.

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).

The ACCF's program the National Cardiovascular Data Registry (NCDR) provides evidence-based solutions for cardiologists and other medical professionals committed to excellence in cardiovascular care. NCDR hospital participants receive confidential benchmark reports that include access to measure macro specifications and micro specifications, the eligible patient population, exclusions, and model variables (when applicable). In addition to hospital sites, NCDR Analytic and Reporting Services provides consenting hospitals' aggregated data reports to interested federal and state regulatory agencies, multi-system provider groups, third-party payers, and other organizations that have an identified quality improvement initiative that supports NCDR-participating facilities. Lastly, the ACCF also allows for licensing of the measure specifications outside of the Registry. For calendar year 2017 the annual pricing for hospitals, NCDR Analytic and Reporting Services, and licensing of measure specifications ranges from \$2900-\$50,000. Measures that are aggregated by ACCF and submitted to NQF are intended for public reporting and therefore there is no charge for

a standard export package. However, on a case by case basis, requests for modifications to the standard export package will be available for a separate charge.

There is no added procedural risk to patients through their hospital's involvement in the CathPCI Registry. No testing, time, risk, or procedures beyond those required for routine care will be imposed.

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)

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

Name of program and sponsor

Quality Improvement with Benchmarking

Name of program and sponsor: Blue Distinction Centers for Cardiac Care; Sponsor: Blue Cross Blue Shield Association

Purpose:

The Blue Distinction Centers for Cardiac Care is a national designation program that recognizes hospitals that demonstrate expertise in delivering quality specialty care, safely and effectively. To earn the Blue Distinction Centers+ designation, hospitals must meet the same quality criteria as Blue Distinction Centers, and go an extra step to demonstrate that they do so cost efficiently. Quality is key: only those facilities that first meet Blue Distinction's nationally established, objective quality measures will be considered for designation as a Blue Distinction Center+. Blue Distinction Centers' goal is to help consumers find both quality and value for their specialty care needs, on a consistent basis, while encouraging healthcare professionals to improve the overall quality and delivery of care nationwide. [Retrieved from <http://www.bcbs.com/healthcare-partners/blue-distinction-for-providers/cardiacprogramcriteria.pdf> on 11/25/13]

Geographic area and number and percentage of accountable entities and patients included

Geographic Area: National program.

Number: Directory of Providers available at <http://www.bcbs.com/why-bcbs/blue-distinction/blue-distinction-cardiac/bluedistinctioncardiac.pdf>

% of accountable entities: Total of 414 hospitals

Alabama 10

Arizona 4

Arkansas 3

California 46

Colorado 6

Connecticut 5
Delaware 3
Florida 29
Georgia 4
Hawaii 1
Idaho 3
Illinois 29
Indiana 12
Iowa 8
Kansas 5
Kentucky 5
Louisiana 5
Maine 1
Massachusetts 8
Michigan 23
Minnesota 12
Missouri 12
Nebraska 5
New Hampshire 2
New Jersey 3
New York 12
Nevada 2
North Carolina 10
North Dakota 4
Ohio 26
Oklahoma 4

Patients included: information not available.

The measure is also used in the Quality Insight Hospital Program with Anthem, which overlaps with what is included above for Blue Distinction program.

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?)

[See below](#)

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.)

[Update to credible plan \(11/8/17\):](#)

We moved forward with implementing the in-hospital mortality measures, however, held off on public reporting since we are also in the process of updating the CathPCI registry to version 5. The new registry version includes elements to assess out-of-hospital cardiac arrest, which has been identified in the literature as a risk factor that should be considered in mortality modeling^{1,2}. Additionally, when preparing the public reporting metric for in-hospital mortality (#0133) and 30-day mortality (#0536), we found that the measures were not harmonized in structure (i.e. the 30-day measure is a hierarchical model whereas the in-hospital measure is not). As such, these measures could not be rolled up together to create an appropriate composite view of mortality. We plan to modify the in-hospital mortality model to a hierarchical structure when we expand to take advantage of the additional elements in version 5 of CathPCI registry, particularly cardiac arrest, rather than sequencing a number of major revisions in a relatively short time period for hospitals. In order to avoid unintended negative consequences, ACC has made the decision to put a hold on public reporting until the cardiac arrest elements can be considered for modeling and the inpatient and 30-day PCI mortality models can be structurally harmonized.

Citation:

[1] Peberdy, M.A., Donnino, M.W., Callaway, C.W., et al. Impact of Percutaneous Coronary Intervention Performance Reporting on Cardiac Resuscitation Centers: A Scientific Statement From the American Heart Association. *Circulation*. 2013;128:762-773; originally published online July 15, 2013; doi: 10.1161/CIR.Ob013e3182a15cd2

[2] Camuglia, A.C., Randhawa, V.K., Lavi, S., et al. Cardiac catheterization is associated with superior outcomes for survivors of out of hospital cardiac arrest: Review and meta-analysis. *Elsevier: Resuscitation* 85 (2014) 1533–1540 .
www.elsevier.com/locate/resuscitation

NCDR Public Reporting Background:

ACC's National Cardiovascular Data Registry (NCDR) Voluntary Hospital Public Reporting Program: The ACC currently runs a program to give hospitals the opportunity to voluntarily publicly report their measure results based on data from the National Cardiovascular Data Registry (NCDR). Hospitals that choose to participate have their results displayed on ACC's CardioSmart. Currently Hospitals can report on five measures from the CathPCI Registry and five measures from the ICD Registry. Of these publicly reporting measures, five are NQF-endorsed:

- NQF # 1522: Use of a medicine in the ACEi or ARB class to improve heart function after ICD implant in patients with less than normal heart function.
- NQF # 1528: Use of a beta-blocker medication after ICD implant in patients with a previous heart attack.
- NQF #1529: Use of a beta-blocker medication after ICD implant in patients with less than normal heart function.
- NQF #0965: Use of all recommended medications (ACEi or ARB and beta-blocker) to improve heart function and blood pressure after ICD implant.
- NQF # 0964: Therapy with aspirin, P2Y12 inhibitor, and statin at discharge following PCI in eligible patients (composite measure)

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.

Performance results are distributed to all CathPCI registry participants as part of quarterly benchmark reports, which provide a detailed analysis of an individual institution's performance in comparison with the entire registry population from participating hospitals across the nation. Reports include an executive summary dashboard, at-a-glance assessments, and patient level drill-downs. Registry participants also have access to an outcome report companion guide which provides common definitions and detailed metric specifications to assist with interpretation of performance rates.

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.

Results are provided as part of quarterly performance report which includes a rolling 4 quarters of data. Participating hospitals in the CathPCI registry report the following: Patient demographics for cardiac catheterization and PCI procedures, provider and facility characteristics, history/factors, cardiac status, treat lesions; intracoronary device utilization and adverse event rates; appropriate use criteria for coronary revascularization; compliance with ACC/AHA clinical guideline recommendations.

The majority of the required data elements are routinely generated and acquired during the delivery of standard cardiac care to this patient population. Electronic extraction of data recorded as part of the procedure expedites data collection. This strategy offers point of care collection and minimizes time and cost. Institutions can manually report using a free web-based tool or automate the reporting by using certified software developed by third-party vendors. The data elements required for this measure are readily available within the patient's medical record or can be attained without undue burden within the hospital. Most data elements exist in a structured format within patient's electronic health record.

There are a number of methods used to educate and provide general support to registry participants. These include the following:

- Registry Site Manager Calls are available for all NCDR participants. RSM calls are provided as a source of communication between NCDR and participants to provide a live chat Q and A session on a continuous basis.
- New User Calls are available for NCDR participants, and are intended for assisting new users with their questions.
- NCDR Annual Conference

The NCDR Annual Conference is a well-attended and energetic two-day program at which participants from across the country come together to hear about new NCDR and registry-specific updates. During informative general sessions, attendees can learn about

topics such as transcatheter therapies, the NCDR dashboard, risk models, data quality and validation, and value-based purchasing. Attendees also receive registry updates and participate in advanced case studies covering such topics as Appropriate Use Criteria and outcomes report interpretation.

- Release notes (for outcomes reports)
- Clinical Support

The NCDR Product Support and Clinical Quality Consultant Teams are available to assist participating sites with questions Monday through Friday, 9:00 a.m. - 5:00 p.m. ET.

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.

Feedback is typically obtained through monthly registry site manager monthly calls, ad hoc phone calls tracked with salesforce software, and during registry –specific break-out sessions at the NCDR’s annual meeting. Registry Steering Committee members may also provide feedback during regularly scheduled calls.

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

Registry participants have communicated to ACC that this measure is easy to understand and interpret. ACC does not receive a lot of questions about the measure and participants seem to be apply the coding instructions correctly to the data elements that impact this measure.

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

No other feedback was received 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.

N/A: the measure was not modified since last endorsement.

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.

This measure does not readily lend itself to improvement across the entire population of hospitals over time because evolutions in technology (e.g. circulatory support) enables sicker patients to be treated. However, the measure does have the opportunity to identify hospitals with higher mortality rates than expected. This both enables hospitals to recognize this problem and develop processes to improve their performance, while also enabling external agencies (state government and payers) to take action to either regulate the institutions (e.g. state governments) or preferentially direct their patients to hospitals with better outcomes (payers).

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.

Although our previous CathPCI Registry mortality models had many assets, they had been criticized for failing to accurately define risk among “extreme risk” patients, such as those with cardiogenic shock and those who have suffered cardiac arrest prior to PCI. This led to concerns about whether decision makers will adopt risk-averse patterns of patient care. In response to these concerns, and to further define risk at the highest end of the spectrum, a series of new variables were included in the 2009 updated Version 4

CathPCI Registry data clarification form (DCF v4). These variables have recently been incorporated into the CathPCI Registry risk adjustment model that is currently used for site-level outcome reporting. Model performance was assessed by discrimination and calibration metrics in a separate split sample. In-hospital mortality was 1.4%, ranging from 0.2% among elective cases (45.1% of total cases) to 65.9% among patients with shock and recent cardiac arrest (0.2% of total cases). With the inclusion of indicators for high-risk PCI, the updated CathPCI Registry DCF v4 mortality models perform well in both low- and high-risk PCI patient populations.[1] There have been no significant concerns raised about the current adequacy of risk adjustment and the inclusion of the additional data elements to better account for patient severity seem to have satisfactorily met the concerns of the interventional community. Accordingly, all elements of the current risk model are being retained in the planned release of an upcoming data collection form, CathPCI Version 5. In addition, cardiac arrest data elements identified in the literature as risk factors will be included in the new version of the registry. We plan to update the risk model to accommodate these elements accordingly.

[1] Brennan J, Curtis JP, Dai D, et al. Enhanced Mortality Risk Prediction With a Focus on High-Risk Percutaneous Coronary Intervention: Results From 1,208,137 Procedures in the NCDR (National Cardiovascular Data Registry). J Am Coll Cardiol Interv. 2013;6(8):790-799. doi:10.1016/j.jcin.2013.03.020. Retrieved from <http://interventions.onlinejacc.org/article.aspx?articleid=1730158>

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

We are unaware of any unanticipated benefits or harms from the 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)

0119 : Risk-Adjusted Operative Mortality for CABG

0230 : Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following acute myocardial infarction (AMI) hospitalization

0535 : 30-day all-cause risk-standardized mortality rate following percutaneous coronary intervention (PCI) for patients without ST segment elevation myocardial infarction (STEMI) and without cardiogenic shock

0536 : 30-day all-cause risk-standardized mortality rate following Percutaneous Coronary Intervention (PCI) for patients with ST segment elevation myocardial infarction (STEMI) or cardiogenic shock

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.

Measure 119 offers a risk-adjusted measure for mortality, as does our Risk-Adjusted Mortality measure. The patient population is similar in that both these measures evaluate the mortality for patients requiring coronary artery revascularization. The measure stewarded by STS provides a risk adjusted outcome evaluated at 30 days post their CABG surgery. While the NCDR measure

evaluates mortality at discharge from the index admission for the PCI. The method of revascularization differs between the two measures, rendering the overlap insubstantial.

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.)

As noted in the previous section, these measures focus on different populations or have different durations of follow-up (30 days vs. in-hospital). We believe that because PCI is the most common cardiac procedure for coronary artery disease, is associated with substantial costs and is variable across hospitals, that there is great importance in having a measure specifically devoted to the outcomes of this procedure.

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: 0133_NQF_Submission_Supplement_20171122_update.pdf](#)

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): American College of Cardiology

Co.2 Point of Contact: Jarrott, Mayfield, jmayfield@acc.org

Co.3 Measure Developer if different from Measure Steward: American College of Cardiology

Co.4 Point of Contact: Kim, Lavin, klavin@acc.org, 202-375-6448-

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.

For this particular topic those individuals who were involved in identifying the key attributes and variables for this process measure were leaders and experts in the field of interventional cardiology. Serial phone calls were held to both define the eligible population and given process. These clinical leaders are noted below.

NCDR Clinical Subworkgroup ensured the measure demonstrated an opportunity for improvement, had strong clinical evidence, and was a reliable and valid measure. These members included Drs. Jephtha Curtis (Chair), Frederick Masoudi, John Rumsfeld, Issam Moussa, and David Malenka.

NCDR Scientific Quality and Oversight Committee—a committee that served as the primary resource for crosscutting scientific and quality of care methodological issues. These members included Drs. Frederick Masoudi (Chair), David Malenka, Thomas Tsai, Matthew Reynolds, David Shahian, John Windle, Fred Resnic, John Moore, Deepak Bhatt, James Tchong, Jephtha Curtis, Paul Chan, Matthew Roe, and John Rumsfeld.

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released: 2001

Ad.3 Month and Year of most recent revision: 04, 2012

Ad.4 What is your frequency for review/update of this measure? With dataset revisions and based on new evidence.

Ad.5 When is the next scheduled review/update for this measure? 04, 2018

Ad.6 Copyright statement: American College of Cardiology Foundation All Rights Reserved

Ad.7 Disclaimers: ACC realizes the various NCDR endorsed measures are not readily available on their own main webpage. However, ACCF plans to update their main webpage (cardiosource.org) to include the macrospecifications of the NQF endorsed measures. ACC hopes to work collaboratively with NQF to create a consistent and standard format would be helpful for various end users. In the interim, the supplemental materials include the details needed to understand this model.

Ad.8 Additional Information/Comments: ACC appreciates the opportunity to submit measures for this NQF endorsement maintenance project.