



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 #: 0127

Corresponding Measures:

De.2. Measure Title: Preoperative Beta Blockade

Co.1.1. Measure Steward: The Society of Thoracic Surgeons

De.3. Brief Description of Measure: Percent of patients aged 18 years and older undergoing isolated CABG who received beta blockers within 24 hours preceding surgery.

1b.1. Developer Rationale: This process measure seeks to improve the quality of care for patients undergoing isolated CABG. The use of preoperative beta blockers (BB) in isolated CABG has been associated with a reduction in postoperative atrial fibrillation. Postoperative atrial fibrillation (POAF) is one of the most common complications of CABG surgery. POAF leads to increased resource utilization, increases the risk of stroke, and independently predicts a lower long-term survival for CABG patients.

A number of studies have called into question the validity of preoperative administration. A meta-analysis by Wang did not demonstrate a statistically significant reduction in mortality or the incidence of the postoperative complications (Atrial fibrillation was not separately studied). LaPar et al. in a study of 43747 patients 80% on preoperative BB and 20% not on preoperative BBs (though presumable received a dose on the day of surgery to meet Society of Thoracic Surgery (STS) guidelines), demonstrated no impact on mortality, morbidity, length of stay or hospital readmission.

No studies allow for the differentiation of the impact of preoperative BB administration in those patients previously taking them versus those whose had not been previously prescribed BBs. Though this might be inferred from the LaPar study. This is one of the shortcomings of this recommendation.

There have not been any new randomized controlled trial studies on this topic published in the literature for the past 4 years. Many recently published studies are observational and have methodological issues, such as lack of specific information regarding the use of alternative AF-prevention strategies that may be responsible for some counterintuitive findings. None of these more recent studies provide evidence that is strong or consistent enough to negate the longstanding preoperative beta blocker recommendation of the ACC/AHA, which is one of the major reasons for its use as a quality metric by STS.

In the 2011 ACC/AHA Guidelines preoperative BB administration is a Class I recommendation for isolated CABG surgery. The 2017 EACTS (European Association for Cardio Thoracic Surgery) designates perioperative BB administration (without timing specification) as a Class IIA recommendation for prevention of postoperative atrial fibrillation.

Given this information, the STS recommends to continue to use preoperative beta blocker as a quality metric, at least until strong evidence emerges to the contrary, based on the following considerations:

1. From a physiologic perspective, preoperative administration of beta blockade in patients without hypotension or bradycardia/heart block makes clinical sense—i.e.. administer before the patient is exposed to cardiac manipulation, atrial incisions, cooling and rewarming, CPB, sympathetic stimulation, pro-arrhythmic drugs, etc.
2. Exclusions are accepted for compliance for patients with a documented contraindication. No patient should be receiving BB inappropriately just to meet the measure.

<p>3. Many older RCTs document significant reductions in atrial and ventricular arrhythmias. There is softer evidence, and somewhat conflicting, regarding mortality reduction, especially with regard to patients with reduced EF (pro and con).</p> <p>4. Several more recent observational studies and reviews have not shown significant mortality/morbidity benefit and mixed results regarding AF; these studies may be underpowered to show a mortality advantage given the low baseline mortality (around 1%).</p> <p>5. BB usage rates are high at present, so may be challenging to do meaningful observational studies or RCTs.</p> <p>6. Beta-blockers are ACC/AHA recommended for patients with stable ischemic heart disease and non-STEMI, and many CABG patients should therefore already be taking BB's before admission for urgent or elective CABG. These should definitely be continued unless there are intervening contraindications such as bradycardia or hypotension.</p> <p>7. There is no strong evidence that CABG patients are being harmed by preop BB, and substantial number of older studies suggesting antiarrhythmic benefit.</p> <p>8. It is not appropriate to use negative data from non-cardiac surgery (e.g., POISE) to argue against beta blocker use in CABG, as cardiac surgery exposes patients to unique risks.</p> <p>9. STS is concerned that elimination of this metric without firm evidence of its lack of efficacy or any harmful effects might have unintended negative consequences. Emphasis on STS process measures, including BB's, has probably contributed to the dramatic decline in CABG mortality over the past decade</p> <p>- Hillis LD, Smith PK, Anderson JL, Bittl JA, Bridges CR, Byrne JG, Cigarroa JE, DiSesa VJ, Hiratzka LF, Hutter AM Jr, Jessen ME, Keeley EC, Lahey SJ, Lange RA, London MJ, Mack MJ, Patel MR, Puskas JD, Sabik JF, Selnes O, Shahian DM, Trost JC, Winniford MD. 2011 ACCF/AHA guideline for coronary artery bypass graft surgery: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2011; 58:e123–210.</p> <p>- Lapar DJ, Crosby IK, Kron IL, et al. Preoperative Beta Blocker Use Should Not Be a Quality Metric for Coronary Artery Bypass Grafting. Ann Thorac Surg 2013; 96:1539-45.</p> <p>- Miguel Sousa-Uva*, Stuart J Head, Milan Milojevic, Jean-Philippe Collet, Giovanni Landoni, Manuel Castella, Joel Dunning, Tómas Gudbjartsson, Nick J Linker, Elena Sandoval, Matthias Thielmann, Anders Jeppsson, Ulf Landmesser*, 2017 EACTS Guidelines on perioperative medication in adult cardiac surgery, European Journal of Cardio-Thoracic Surgery, Volume 53, Issue 1, January 2018, Pages 5–33, https://doi.org/10.1093/ejcts/ezx314</p> <p>- Wang L, Wang H, Hou X. Short-term effects of preoperative beta-blocker use for isolated coronary artery bypass grafting: A systematic review and meta-analysis. J Thorac Cardiovasc Surg 2018; 155:620-9.</p>
<p>S.4. Numerator Statement: Number of patients undergoing isolated CABG who received beta blockers within 24 hours preceding surgery</p> <p>S.6. Denominator Statement: Patients aged 18 years and older undergoing isolated CABG</p> <p>S.8. Denominator Exclusions: Cases are removed from the denominator if preoperative beta blocker was contraindicated or if the clinical status of the patient was emergent or emergent salvage prior to entering the operating room.</p>
<p>De.1. Measure Type: Process</p> <p>S.17. Data Source: Registry Data</p> <p>S.20. Level of Analysis: Clinician : Group/Practice, Facility</p>
<p>IF Endorsement Maintenance – Original Endorsement Date: May 09, 2007 Most Recent Endorsement Date: Jan 25, 2017</p>
<p>IF this measure is included in a composite, NQF Composite#/title:</p> <p>IF this measure is paired/grouped, NQF#/title:</p> <p>De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results?</p>

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

[127_NQF_evidence_attachment_PreopBB_Fall2020-637418380994618288.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.

Yes

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 process measure seeks to improve the quality of care for patients undergoing isolated CABG. The use of preoperative beta blockers (BB) in isolated CABG has been associated with a reduction in postoperative atrial fibrillation. Post-operative atrial fibrillation (POAF) is one of the most common complications of CABG surgery. POAF leads to increased resource utilization, increases the risk of stroke, and independently predicts a lower long-term survival for CABG patients.

A number of studies have called into question the validity of preoperative administration. A meta-analysis by Wang did not demonstrate a statistically significant reduction in mortality or the incidence of the postoperative complications (Atrial fibrillation was not separately studied). LaPar et al. in a study of 43747 patients 80% on preoperative BB and 20% not on preoperative BBs (though presumable received a dose on the day of surgery to meet Society of Thoracic Surgery (STS) guidelines), demonstrated no impact on mortality, morbidity, length of stay or hospital readmission.

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Given this information, the STS recommends to continue to use preoperative beta blocker as a quality metric, at least until strong evidence emerges to the contrary, based on the following considerations:

1. From a physiologic perspective, preoperative administration of beta blockade in patients without hypotension or bradycardia/heart block makes clinical sense—i.e.. administer before the patient is exposed to cardiac manipulation, atrial incisions, cooling and rewarming, CPB, sympathetic stimulation, pro-arrhythmic drugs, etc.

2. Exclusions are accepted for compliance for patients with a documented contraindication. No patient should be receiving BB inappropriately just to meet the measure.
3. Many older RCTs document significant reductions in atrial and ventricular arrhythmias. There is softer evidence, and somewhat conflicting, regarding mortality reduction, especially with regard to patients with reduced EF (pro and con).
4. Several more recent observational studies and reviews have not shown significant mortality/morbidity benefit and mixed results regarding AF; these studies may be underpowered to show a mortality advantage given the low baseline mortality (around 1%).
5. BB usage rates are high at present, so may be challenging to do meaningful observational studies or RCTs.
6. Beta-blockers are ACC/AHA recommended for patients with stable ischemic heart disease and non-STEMI, and many CABG patients should therefore already be taking BB's before admission for urgent or elective CABG. These should definitely be continued unless there are intervening contraindications such as bradycardia or hypotension.
7. There is no strong evidence that CABG patients are being harmed by preop BB, and substantial number of older studies suggesting antiarrhythmic benefit.
8. It is not appropriate to use negative data from non-cardiac surgery (e.g., POISE) to argue against beta blocker use in CABG, as cardiac surgery exposes patients to unique risks.
9. STS is concerned that elimination of this metric without firm evidence of its lack of efficacy or any harmful effects might have unintended negative consequences. Emphasis on STS process measures, including BB's, has probably contributed to the dramatic decline in CABG mortality over the past decade

- Hillis LD, Smith PK, Anderson JL, Bittl JA, Bridges CR, Byrne JG, Cigarroa JE, DiSesa VJ, Hiratzka LF, Hutter AM Jr, Jessen ME, Keeley EC, Lahey SJ, Lange RA, London MJ, Mack MJ, Patel MR, Puskas JD, Sabik JF, Selnes O, Shahian DM, Trost JC, Winniford MD. 2011 ACCF/AHA guideline for coronary artery bypass graft surgery: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2011; 58:e123–210.
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- Wang L, Wang H, Hou X. Short-term effects of preoperative beta-blocker use for isolated coronary artery bypass grafting: A systematic review and meta-analysis. J Thorac Cardiovasc Surg 2018; 155:620-9.

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.

The measure was calculated using STS data for patients undergoing isolated CABG in two consecutive time periods January-December 2018 and January-December 2019. For each participant, the summary statistic provided is the proportion of eligible patients who receive preoperative beta blockade. An exact 95% exact binomial confidence interval was calculated for each participant's observed proportion. A higher proportion indicates better performance. The percentiles were calculated after ordering the participants' measures from the smallest to the largest. The 10th percentile value, for example, is the value that is larger than 10% of all participants.

Distribution	1/2018 - 12/2018
Observed Proportion	1/2019 - 12/2019
Observed Proportion	
# Participant	1035 997

# Operations	146984	146297
Mean	0.95	0.95
STD	0.086	0.082
IQR	0.067	0.057
0%	0.095	0.37
10%	0.838	0.86
20%	0.910	0.92
30%	0.948	0.96
40%	0.968	0.97
50%	0.980	0.98
60%	0.990	0.99
70%	0.996	1.00
80%	1.000	1.00
90%	1.000	1.00
100%	1.000	1.00

If the above table is not clearly displayed, please refer to the version included in the appendix for this measure.

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.

In the table below we provide trends over time of the measure at the patient level. Aggregate percentages of patients receiving the measure across four consecutive time periods are computed for relevant subgroups by age, gender, race, ethnicity and insurance status.

	Jan 16-Dec 16	Jan 17-Dec 17	Jan 18-Dec 18	Jan 19-Dec 19
All	95.18%	95.53%	96.02%	96.55%
Patient Gender	95.02%	95.38%	95.91%	96.42%
Male				
Female	95.68%	95.98%	96.38%	96.98%
Age Groups	95.29%	95.63%	96.16%	96.66%
Age<75				
Age>=75	94.72%	95.09%	95.45%	96.12%
Race Groups	95.52%	95.75%	96.16%	96.56%
Race: White				
Race: Black	96.10%	96.36%	96.75%	96.92%
Race: Other	92.12%	93.22%	94.46%	96.23%
Insurance, Age>= 65				
Medicare+Medicaid	94.55%	94.97%	95.40%	95.96%
Medicare+Commercial without Medicaid	95.35%	95.60%	95.82%	96.28%
Medicare without Medicaid/Commercial	94.13%	95.00%	95.56%	96.50%
Insurance, Age<65				
Medicare/Medicaid	95.95%	95.97%	96.43%	96.60%
Commercial/HMO	95.39%	95.57%	96.30%	96.83%
None/Self Paid	96.61%	97.34%	97.80%	97.48%
Other	95.10%	95.40%	97.11%	96.88%

If the above table is not clearly displayed, please refer to the version included in the appendix for this measure.

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

N/A

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, Surgery, Surgery : Cardiac Surgery

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

Safety, Safety : Medication

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

Adults, Elderly

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.sts.org/sites/default/files/STSAultCVDDataCollectionFormV4_20_2_GOLDEN006292020.pdf

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)

No data dictionary 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.

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.

None

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).

Number of patients undergoing isolated CABG who received beta blockers within 24 hours preceding surgery

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).

Number of isolated CABG procedures in which preoperative beta blockers [MedBeta (STS Adult Cardiac Surgery Database Version 4.20)] is marked "yes"

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

Patients aged 18 years and older undergoing isolated CABG

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).

Number of isolated CABG procedures excluding cases for which preoperative beta blockers were contraindicated or if the clinical status of the patient was emergent or emergent salvage prior to entering the operating room. The SQL code used to create the function used to identify cardiac procedures is provided in the Appendix.

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

Cases are removed from the denominator if preoperative beta blocker was contraindicated or if the clinical status of the patient was emergent or emergent salvage prior to entering the operating room.

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.)

Procedures with preoperative beta blockers [MedBeta (STS Adult Cardiac Surgery Database Version 4.20)] marked as "Contraindicated" or procedures with Status [Status(STS Adult Cardiac Surgery Database Version 2.81)] marked "Emergent" or "Emergent Salvage"

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

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

No risk adjustment or risk stratification

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 = Higher 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.*)

Please refer to numerator and denominator sections for detailed information.

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.

STS Adult Cardiac Surgery Database Version 4.20

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*)

Clinician : Group/Practice, 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

0127_NQF_testing_v7.1-PreoperativeBetaBlockade-11092020-637406041398241851-637418248337276219.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**.

Some data elements are in defined fields in electronic sources

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).

The STS Adult Cardiac Surgery Database (ACSD) has more than 1,030 participants as of August 2020, and local availability of data elements in electronic format will vary across institutions. Some institutions may have full EHR capability while others may have partial, or no availability. However, all data elements from participating institutions are submitted to the STS ACSD in electronic format following a standard set of data specifications. The majority of participating institutions obtain data entry software products that are certified for the purposes of collecting STS ACSD data elements.

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.

The data elements included in this measure have been standard in the STS Adult Cardiac Surgery Database for at least 6 years and some of them have been part of the database for more than 20 years. The variables are considered to be data elements that are readily available and already collected as part of the process of providing care.

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).

Data Collection:

There are no additional costs for data collection specific to this measure for those presently using and participating in the STS Adult Cardiac Surgery Database. Costs to develop and maintain the measure included volunteer cardiothoracic surgeon time, STS staff time, and Duke Clinical Research Institute statistician and project management time.

Other fees:

STS Adult Cardiac Surgery Database participants (generally a group of surgeons) pay annual participant fees of \$3,500 or \$4,750, depending on whether the majority of surgeons in a participant group are STS members. As a benefit of STS membership, the member-majority participants are charged the lesser of the two fees. Also, member-majority participants pay an additional fee of \$150 per surgeon; non-member-majority participants pay an additional fee of \$350 per surgeon.

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)
	<p>Public Reporting STS Public Reporting https://www.sts.org/registries/sts-public-reporting STS Public Reporting https://www.sts.org/registries/sts-public-reporting</p> <p>Payment Program This is PQRS measure #44. The STS National Database was once again designated a Qualified Clinical Data Registry (QCDR) for PQRS reporting in 2016. STS reports this measure to CMS on behalf of all consenting surgeons. http://www.sts.org/quality-research-patient-safety/quality/physician-quality-reporting-system</p> <p>Quality Improvement (Internal to the specific organization) STS Adult Cardiac Surgery Database https://www.sts.org/registries-research-center/sts-national-database/adult-cardiac-surgery-database</p>

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

Voluntary STS Public Reporting – approximately 79% of STS Adult Cardiac Surgery Database participants are enrolled as of October 2020.

This measure is publicly reported as a component of the Perioperative Medications domain of the isolated CABG composite. (<https://publicreporting.sts.org/acsd>)

STS Adult Cardiac Surgery Database Participant Feedback Reports provide performance results for this measure to participants. (see details in 4a2.1.1 below)

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?)

N/A

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.)

N/A

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.

As of November 2020, there are 1,030 active U.S. and Canadian participants in the STS Adult Cardiac Surgery Database (ACSD). A "participant" is generally a group of cardiothoracic surgeons who agree to submit case records for analysis and comparison with benchmarking data for quality improvement initiatives. At the option of the surgical group, the ACSD participant can include a hospital and/or associated anesthesiologists. It is for this reason that we have indicated (on the Specifications tab, question #S.20) that this measure is specified/tested for both the "clinician: group/practice" and "facility" levels of analysis.

(For more information on STS "participants," see our response to 1.5 in the measure testing form.)

All ACSD participants receive quarterly data reports with their performance results, reported in an easy-to-understand format. The participant's score is illustrated graphically in relation to the 25th, 50th and 75th percentiles of the distribution across all participants who were eligible for inclusion in that quarter's analysis, and is also accompanied by the 95% Bayesian credible interval. Surgeons easily grasp this result and the visual display clearly illustrates how they perform compared to their peers on a quarterly basis. In addition, these risk-adjusted results allow surgeons to compare their patients' outcomes with national benchmarks and to initiate quality improvement efforts as needed.

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.

Please see response under 4a2.1.1

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.

The adult cardiac surgeons from across the U.S. who comprise the STS Adult Cardiac Surgery Task Force meet periodically to discuss the participant reports and to consider potential enhancements to the ACSD. Additions/clarifications to the data collection form and to the content/format of the participant reports are discussed and implemented as appropriate.

Most recently, STS surgeon members have expressed interest in real-time, online data updates, which has led to the development of dashboard-type reporting on STS.org. Developed by IQVIA, the Society's new data warehouse (<https://www.sts.org/registries->

research-center/sts-national-database/database-transition-resources), the new platform for the Adult Cardiac Surgery Database was released in early 2020. Surgeon members have access to near-real time data updates in the dashboard. Enhancements to dashboard functionality are ongoing.

Also, adult cardiac public reporting has been available since 2010 (<http://publicreporting.sts.org/acsd>), making star ratings for consenting participant groups available to participants as well as the public.

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

Please see response under 4a2.2.1

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

Voluntary participation in ACSD public reporting has continually increased over the years that the initiative has been available, from 38% of ACSD participants in 2014, to 49% in 2016, to 67% in 2018, to approximately 79% in October 2020. This trend suggests that feedback from ACSD participants and others who access the performance data available on STS.org is sufficiently positive to promote ever-increasing participation in public reporting.

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

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 overall usage rates in the last three 12-month periods were 95.53%, 96.03% and 96.54% (January-December 2017, 2018 and 2019 respectively). This trend demonstrates the continuous progress on improvement that the STS expects to see in all of our quality metrics.

Number of participants and operations by geographic regions, in 2018 and 2019

Period January-December 2018					Period January-December 2019						
	Midwest	NE	Other*	South	West		Midwest	NE	Other	South	West
# Part.	281	135	7	402	210	# Part.	262	134	1	391	209
% Part.	27.1%	13.0%	0.7%	38.8%	20.3%	% Part.	26.3%	13.4%	0.1%	39.2%	21.0%
# Oper.	33480	23638	2723	64329	22814	# Oper.	33060	24603	4	65125	23505
% Oper.	22.8%	16.1%	1.9%	43.8%	15.5%	% Oper.	22.598%	16.817%	0.003%	44.516%	16.067%

*Other: Ontario, Canada

If the above table is not clearly displayed, please refer to the version included in the appendix for this measure.

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.

All public reporting initiatives have the potential for unintended consequences, including gaming and risk aversion. We attempt to

control the former through a careful audit process; 10% of STS Adult Cardiac Surgery Database participants were audited in each year from 2014 through 2019. (Our audit plans for 2020 were canceled due to the coronavirus pandemic; we expect to resume with 10% audits in 2021.) We control for risk aversion by having a robust methodology that appropriately adjusts the expected risk for providers who care for sicker patients.

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

N/A

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)

0114 : Risk-Adjusted Postoperative Renal Failure

0115 : Risk-Adjusted Surgical Re-exploration

0116 : Anti-Platelet Medication at Discharge

0117 : Beta Blockade at Discharge

0118 : Anti-Lipid Treatment Discharge

0119 : Risk-Adjusted Operative Mortality for CABG

0129 : Risk-Adjusted Postoperative Prolonged Intubation (Ventilation)

0130 : Risk-Adjusted Deep Sternal Wound Infection

0131 : Risk-Adjusted Stroke/Cerebrovascular Accident

0134 : Use of Internal Mammary Artery (IMA) in Coronary Artery Bypass Graft (CABG)

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

Additional related measure: 0696 - STS CABG Composite (not listed in drop-down menu for 5.1a)

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?

Yes

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

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:** [0127_Preoperative_Beta_Blockade_Appendix_-_S.9-_1b.2-_1b.4-_10212020-637407304983146253.pdf](#)

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): The Society of Thoracic Surgeons

Co.2 Point of Contact: Mark, Antman, mantman@sts.org, 312-202-5856-

Co.3 Measure Developer if different from Measure Steward: The Society of Thoracic Surgeons

Co.4 Point of Contact: Mark, Antman, mantman@sts.org, 312-202-5856-

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.

The STS Quality Measurement Task Force (chaired by David Shahian, MD) is responsible for measure development. Members of the STS Task Force on Quality Initiatives provide clinical expertise as needed. The STS Workforce on Quality meets at the STS Annual Meeting and reviews the measures on a yearly basis. Changes or updates to the measure will be at the recommendation of the Workforce.

Quality Measurement Task Force

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Diane Alejo; Johns Hopkins Univ., Baltimore, MD

Vinay Badhwar, MD; West Virginia University Hospitals, Morgantown, WV

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Sean M. O'Brien, PhD; Duke Clinical Research Institute, Durham, NC
Measure Developer/Steward Updates and Ongoing Maintenance Ad.2 Year the measure was first released: 2004 Ad.3 Month and Year of most recent revision: 06, 2016 Ad.4 What is your frequency for review/update of this measure? Annually Ad.5 When is the next scheduled review/update for this measure? 01, 2021
Ad.6 Copyright statement: N/A Ad.7 Disclaimers: N/A
Ad.8 Additional Information/Comments: N/A