NATIONAL QUALITY FORUM

TO: NQF Members and Public

FR: NQF Staff

RE: Voting draft report for *National Voluntary Consensus Standards: Surgery Endorsement Maintenance 2010, Phase I: A Consensus Report*

DA: August 16, 2011

BACKGROUND

The rate of surgical procedures continues to increase each year, as does the number and type of sites performing surgical procedures. Measuring quality of care across the many and varied locations in which surgical procedures are performed is important to ensure safe, cost-effective care consistent with the current evidentiary base. The recommended measures include measures endorsed prior to June 2008 that have undergone maintenance. The majority of measures considered in this phase focus on cardiac surgery, and they represent the first of two groups of surgery-related measures considered in this endorsement maintenance project.

A 24-member Steering Committee representing a range of stakeholder perspectives was appointed to review a total of 30 candidate and endorsed standards for quality performance in surgical care in this phase. The Steering Committee recommended 18 measures of which one was recommended for placement in "reserve status". All are National Quality Forum (NQF)-endorsed® measures that have been updated as part of the maintenance process.

Comments and Revised Voting Report

NQF received 35 comments from 11 organizations and individuals on measures both recommended and not recommended for endorsement as well as general comments. The distribution of individual comments by Member Council follows:

- Consumers: 10 comments
- Health Professionals: 5 comments
- Purchasers: 9 comments
- Public Health/Community: 0 comments
- Health Plans: 1 comment
- Quality Measurement, Research, and Improvement: 0 comments
- Providers: 9 comments
- Supplier and Industry: 1 comment
- Non-members: 0 comments

A table of complete comments submitted during the comment period, with the responses to each comment and the actions taken by the Steering Committee and measure developers, is posted to the Surgery project page under the Public and Member-Phase I comment section.

The revised draft document, *National Voluntary Consensus Standards: Surgery Endorsement Maintenance 2010, Phase I: A Consensus Report* is posted on the Surgery project page on the NQF website along with the following additional information:

- Measure submission forms; and
- Meeting and call summaries from the Steering Committee's discussions.

Revisions to the draft report and the accompanying measure specifications are identified as redlined changes. (Note: Typographical errors and grammatical changes have not been red-lined to assist in reading).

COMMENTS AND THEIR DISPOSITION

Comments about specific measure specifications were forwarded to the developers, who were invited to respond.

At its review of all comments, the Steering Committee had the benefit of developer responses. Committee members focused their discussion on recurring concerns and specific measures and topic areas that were most controversial or that questioned positions they had taken.
The Committee made no changes to its measure recommendations.

Several themes emerged in the comments including:

- extension of clinician group measures to include individual clinician level of measurement;
- use of hierarchical logistic regression modeling;
- including age specifications in measure descriptions and denominator statements;
- opposition to recommendation of endorsement and placement in reserve status for measure 0113: Participation in a systematic database for cardiac surgery (STS); and
- encouragement to recommend measure 0124: Surgical volume-a. isolated coronary artery bypass graft (CABG) surgery, b. valve surgery, c. CABG + valve surgery for NQF endorsement

General Comments

Inclusion of individual clinician level of measurement
Commenters suggested that the Society of Thoracic Surgeons (STS) measure the performance of individual clinicians to provide consumers with information to make educated decisions about their healthcare and to advance the quality of care at the clinician level. The measure developer indicated that the number of procedures performed by individual surgeons is low and, for CABG, continues to decline such that ability to discriminate performance is not reliable; that selection of providers for CABG surgery should be based on competence of the entire team; and that clinician level reporting could produce risk aversion. The Committee agreed that where appropriate, reporting at the clinician level is important but should be done only where the issues are carefully considered. It noted that groups and hospitals can generate individual clinician information from the STS measures for use in quality improvement activities.

Use of hierarchical logistic regression modeling
Multiple comments were submitted with the concern of risk adjustment models not accounting for patient risk factors and variation of care. The Committee believes it is important that measures take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. NQF will have a white paper on risk adjustment for the Consensus Standards Approval Committee (CSAC) to review in the fall of 2011.

Comments on Measures Recommended for Endorsement

Inclusion of age specifications

Comments were submitted regarding the need to include the age range of the target population in the measure descriptions and denominator statements in addition to further into the specifications. STS has added the age range to each of their measures in the requested location within the specifications. NQF is working to develop additional guidance to measure developers to encourage greater standardization on how measure specifications are defined.

Comments on Measures Recommended for Endorsement and Placement in Reserve Status

Opposition of recommendation of measure 0113
Several comments were put forward concerning the Committee's recommendation regarding measure 0113: Participation in a systematic database for cardiac surgery. Commenters indicated that the measure has a performance rate of 95 percent and there is a lack of evidence on whether participation in a registry alone improves quality of care. The measure developer noted that there are observational data that registries do make contributions to quality improvement. The Committee maintained its recommendation for continued endorsement with placement in reserve status based on its determination that this measure is highly credible, reliable and valid and provides a way to collect and benchmark facility data to improve healthcare quality.

Comments on Measures Not Recommended for Endorsement

Encouragement to recommend measure 0124
Numerous comments were received asking the Committee to reconsider its decision to not recommend measure 0124: Surgical volume-a. isolated coronary artery bypass graft (CABG) surgery, b. valve surgery, c. CABG + valve surgery for NQF endorsement. Commenters believe volume is linked to providing a higher quality of care and patient outcomes. The Committee, as well as the developer, noted that there is not a strong volume/outcome relationship for CABG and maintained its recommendation.

NQF MEMBER VOTING
Effective July 1, 2011, the voting cycle has changed from 30 days to **15 days** for NQF members to submit their votes. Information for electronic voting has been sent to NQF Member organization primary contacts. Accompanying comments must be submitted via the online voting tool.

NATIONAL QUALITY FORUM

NATIONAL VOLUNTARY CONSENSUS STANDARDS: SURGERY ENDORSEMENT MAINTENANCE 2010, PHASE I: A CONSENSUS REPORT

DRAFT REPORT FOR VOTING

AUGUST 16, 2011

NATIONAL QUALITY FORUM

NATIONAL VOLUNTARY CONSENSUS STANDARDS: SURGERY ENDORSEMENT MAINTENANCE 2010, PHASE I: A CONSENSUS REPORT

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NATIONAL VOLUNTARY CONSENSUS STANDARDS: SURGERY ENDORSEMENT MAINTENANCE 2010, PHASE I: A CONSENSUS REPORT

EXECUTIVE SUMMARY

The rate of surgical procedures continues to rise each year, as has the number and type of sites performing surgical procedures. In 2006, 46 million inpatient surgeries were performed in the United States.[1] In addition, more than 53 million procedures were performed in ambulatory surgery centers.[2] In 2007, there were 4,964 Medicare-certified ambulatory surgery centers, which represents a 64 percent increase from 2000.[3] Assessing quality of care, using measures that reflect the current evidentiary base, across the many and varied locations in which surgical procedures are performed is important to ensure safe, cost-effective care. The National Quality Forum (NQF) has endorsed a number of consensus standards for surgical procedures and care of surgical patients over the past six years. This evaluation of all NQF-endorsed® surgery-related measures and consideration of new measures will ensure the currency and relevance of NQF's portfolio of voluntary consensus standards.

This report presents the results of the evaluation of 23 measures considered under NQF's Consensus Development Process (CDP). Eighteen measures are recommended for endorsement as voluntary consensus standards suitable for public reporting and quality improvement. Of the 18, one is recommended for placement in "reserve status". All are previously endorsed measures that have undergone maintenance.

- 0114 Risk-adjusted post-operative renal failure (STS)
- 0115 Risk-adjusted surgical re-exploration (STS)
- 0129 Risk-adjusted prolonged intubation (ventilation) (STS)
- 0131 Risk-adjusted stroke/cerebrovascular accident (STS)
- 0119 Risk-adjusted operative mortality for CABG (STS)
- 0120 Risk-adjusted operative mortality for aortic valve replacement (AVR) (STS)
- 0121 Risk-adjusted operative mortality for mitral valve (MV) replacement (STS)
- 0122 Risk-adjusted operative mortality MV replacement + CABG surgery (STS)
- 0123 Risk-adjusted operative mortality for aortic valve replacement (AVR) + CABG surgery (STS)
- 1501 Risk-adjusted operative mortality for mitral valve (MV) repair (STS)

- 1502 Risk-adjusted operative mortality for MV repair + CABG surgery (STS)
- 0360 Esophageal resection mortality rate (IQI 8) (AHRQ)
- 0361 Esophageal resection volume (IQI 1) (AHRQ)
- 0116 Anti-platelet medication at discharge (STS)
- 0118 Anti-lipid treatment discharge (STS)
- 0130 Risk-adjusted deep sternal wound infection rate (STS)
- 0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time (CMS)
- 0113 Participation in a systematic database for cardiac surgery (STS) (reserve status)

NATIONAL VOLUNTARY CONSENSUS STANDARDS: SURGERY ENDORSEMENT MAINTENANCE 2010, PHASE I: A CONSENSUS REPORT

BACKGROUND

The rate of surgical procedures continues to rise each year, as has the number and type of sites performing surgical procedures. In 2006, 46 million inpatient surgeries were performed in the United States.[4] In addition, more than 53 million procedures were performed in ambulatory surgery centers.[5] In 2007, there were 4,964 Medicare-certified ambulatory surgery centers, which represents a 64 percent increase from 2000.[6] Assessing quality of care, using measures that reflect the current evidentiary base, across the many and varied locations in which surgical procedures are performed is important to ensure safe, cost-effective care. The National Quality Forum (NQF) has endorsed a number of consensus standards for surgical procedures and care of surgical patients over the past six years. The ongoing evaluation and updating of all NQF-endorsed® surgical measures and consideration of new measures will ensure the currency and relevance of NQF's portfolio of voluntary consensus standards.

The recommended measures include measures that have undergone the NQF maintenance. They update NQF-endorsed surgery-related measures to facilitate efforts to provide high-quality care to patients undergoing surgery.

STRATEGIC DIRECTIONS FOR NQF

NQF's mission includes three parts: 1) setting national priorities and goals for performance improvement; 2) endorsing national consensus standards for measuring and publicly reporting on performance; and 3) promoting the attainment of national goals through education and outreach programs. As greater numbers of quality (including safety) measures are developed and brought to NQF for consideration of endorsement, it is incumbent on NQF to assist stakeholders to "measure what makes a difference" and address what is important to achieve the best outcomes for patients and populations.

Several strategic issues have been identified to guide consideration of candidate consensus standards:

DRIVE TOWARD HIGH PERFORMANCE. Over time, the bar of performance expectations should be raised to encourage achievement of higher levels of system performance.

EMPHASIZE COMPOSITES. Composite measures provide much-needed summary information

pertaining to multiple dimensions of performance and are more comprehensible to patients and consumers.

MOVE TOWARD OUTCOME MEASUREMENT. Outcome measures provide information of keen interest to consumers and purchasers, and when coupled with healthcare process measures, they provide useful and actionable information to providers. Outcome measures also focus attention on much-needed system-level improvements, since achieving the best patient outcomes often requires carefully designed care processes, teamwork, and coordinated action on the part of many providers.

CONSIDER DISPARITIES IN ALL WE DO. Some of the greatest performance gaps relate to care of minority populations. Particular attention should be focused on identifying disparities-sensitive performance measures and on identifying the most relevant race/ethnicity/language/socioeconomic strata for reporting purposes.

NATIONAL PRIORITIES PARTNERSHIP

NQF seeks to endorse measures that address the National Priorities and Goals of the NQF-convened National Priorities Partnership.[7] The Partnership represents those who receive, pay for, provide, and evaluate healthcare. The National Priorities and Goals focus on these areas:

- patient and family engagement,
- safety,
- care coordination,
- palliative and end-of-life care,
- equitable access,
- elimination of overuse,
- population health, and
- infrastructure supports.

RELATED NQF WORK

In 2004, NQF endorsed 21 consensus standards for cardiac surgery under the National Voluntary Consensus Standards for Cardiac Surgery[8] project, the largest number of surgical measures endorsed in a single project. NQF has endorsed consensus standards applicable to surgery in a number of other projects

including National Voluntary Consensus Standards for Hospital Care: Specialty Clinician Performance Measures[9] and National Voluntary Consensus Standards for Hospital Care 2007: Performance Measures.[10]

NQF'S CONSENSUS DEVELOPMENT PROCESS

Phase I of NQF's National Voluntary Consensus Standards for Surgery Care project seeks to continue endorsement of 18 measures for quality improvement and public reporting. Of these, all are endorsed measures that have been updated for maintenance; one of which is recommended for placement in "reserve status".

Evaluating Potential Consensus Standards

Candidate consensus standards were solicited through a Call for Measures on September 29, 2010. Additionally, surgery-related measures endorsed prior to June 2008 were brought into the project as part of NQF's routine maintenance process. Thirty measures were evaluated for suitability as voluntary consensus standards for quality improvement and public reporting using NQF's standard evaluation criteria.[11] Steering Committee subgroups rated each measure's strengths and weaknesses using the criteria and subcriteria to assist the Committee in making recommendations. The 24-member, multi-stakeholder Committee provided final evaluations of the four main criteria—importance to measure and report, scientific acceptability of the measure properties, usability, and feasibility—and made endorsement recommendations. Measure developers were available during Committee discussions to respond to questions and clarify any issues or concerns.

Overarching Measure Evaluation Issues

The Committee discussed several overarching issues, which, for some measures, factored into the Committee's ratings and recommendations.

Clarity of Measure Specifications

Committee members requested clarification of a number of measure specifications related to incompleteness of specifications, inconsistencies in language, and construction of algorithms. The Committee considered the documents and appendices that were provided as attachments to the measure submissions to be useful in evaluating the measures; however, it urged measure developers to include all

pertinent information within the submission forms to ensure accurate understanding of the measures for potential users and to provide clarity to the public.

Participation in Proprietary Registries

A number of measures that are advanced for continued endorsement rely on proprietary registry data, although they do not require participation in the identified registry. The Committee took the position that endorsing a measure that requires use of proprietary registry data is unacceptable because by default it requires participation in the registry. Furthermore, the data for a number of measures are not routinely collected outside the registry, which adds to the burden of collection for organizations. Finally, the use of such measures makes it essential that the specifications are fully detailed in a transparent fashion and that required data elements are standardized.

Topped Out Measures

The Committee debated the definition of "topped out." It agreed that some measures are performing at such a high level that continued efforts to improve performance are probably not warranted. With an NQF draft proposal for special designation, later presented and approved by the NQF Board of Directors, as a starting point, the Committee agreed that such measures should be maintained in the NQF portfolio with some specific designation provided they address important aspects of quality that should be sustained and fully meet all endorsement criteria with the exception of "importance" as long as failure to meet this criterion was due to a high level of performance. The Committee wanted to ensure that performance among the subpopulations included in measures was high; in some cases there were disparities that suggested a need to continue specific measures. Also, there was concern that failing to continue endorsement of maintenance measures that meet all evaluation criteria but are not viewed as important for regular continued monitoring because of a high level of performance could result in inattention to the process or outcome and consequently to reduced levels of performance and potentially poor patient outcomes. This latter concern prompted the Committee to support the proposal to place high-performing measures in "Reserve Status," that is, they retain endorsement but do not have to be regularly reported.

Failure to Provide Information about Disparities and Public Reporting

The NQF endorsement criteria specify that measures must be used for quality improvement and public reporting. The Committee noted that many measure submission forms lacked information about disparities and public reporting. In each case where information about disparities was not included,

reporting was not currently occurring, or plans were not in place to begin reporting, the Committee asked that such information be provided prior to endorsement recommendations.

Impact on Quality

The Committee suggested measure developers provide detail on how their NQF-endorsed measure(s) have impacted quality since initial endorsement. The Committee considered such information as vital to the process of deciding whether a measure should retain endorsement.

Current Evidence and Relationship to Outcomes

The Committee expressed its preference for measures that provide clear and direct evidence of the measure's proximity to an improved outcome. Ensuring that the evidence provided to support the measure is current was highlighted, particularly for measures undergoing maintenance.

Related and Competing Measures

A subset of the candidate consensus standards was related or competing with other candidate or NQF-endorsed measures. The Steering Committee first evaluated each candidate standard on its own merits and then compared the measures that met NQF evaluation criteria with the related or competing measures using NQF's harmonization and competing measures guidance.

RECOMMENDATIONS FOR ENDORSEMENT

This report presents the results of the evaluation of 23 measures considered under the NQF CDP. The comment period for the draft report occurred between June 13 and July 12, 2011. NQF received 35 comments from 11 organizations and individuals. A summary of the comments received and the Committee's responses are included in the evaluation summary table for each measure in the following sections. The complete text of the comments and responses are posted on the Surgery project web page.

Candidate Consensus Standards Recommended for Endorsement

Eighteen measures are recommended for continued endorsement as voluntary consensus standards suitable for public reporting and quality improvement. Of these, one is recommended for placement in "reserve status". Evaluation summary tables follow the list of measures and summarize the results of the Steering Committee's evaluation of and voting on the candidate consensus standards that are recommended for continued endorsement and the subsequent public and NQF member comments. Hyperlinks are provided:

- from each listed measure to the evaluation summary table;
- from each summary table to the detailed measure specifications:
- from each summary table to the web page where all materials submitted by the developer or steward are posted; and
- from each summary table to the web page where the meeting and call summaries, transcripts, and recordings can be accessed.

The Steering Committee recommended the following candidate consensus standards for continued endorsement.

Cardiac—CABG

Cardiac—CABG: Valve Replacement/ Repair

Esophageal Resection and Transfusion

Cardiac—CABG ~~and Prophylaxis~~

Venous Thromboembolism (VTE)

Evaluation Summary—Candidate Consensus Standards Recommended for Continued Endorsement

0114 Risk-adjusted post-operative renal failure
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call

0114 Risk-adjusted post-operative renal failure

Proceedings

Description: Percent of patients aged 18 years and older undergoing isolated CABG (without pre-existing renal failure) who develop post-operative renal failure or require dialysis.
Numerator Statement: Number of patients undergoing isolated CABG (without pre-existing renal failure) who develop post-operative renal failure or require dialysis.
Denominator Statement: All patients undergoing isolated CABG.
Exclusions: Patients with documented history of renal failure, baseline serum creatinine of 4.0 or higher; prior renal transplants are not considered pre-operative renal failure unless since transplantation their Cr has been or is 4.0 or higher.
Adjustment/Stratification: case-mix adjustment/No stratification is required for this measure.
Level of Analysis: Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities
Type of Measure: Outcome
Data Source: Registry data-STS Adult Cardiac Surgery Database, Version 2.73
Measure Steward: Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611

Steering Committee Recommendation for Endorsement: Y-17; N-1; A-1
Rationale: This is an important metric for benchmarking data on patients undergoing isolated CABG who develop post-operative renal failure or require dialysis.

If applicable, Conditions/Questions for Developer:

1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities.
2. 2a.1 Numerator Statement: The statement does not indicate participation in the STS database is required.
3. 2a.2 Numerator Time Window: Provide the time period in which cases are eligible for inclusion in the numerator.
4. 2a.3 Numerator Details: Provide a more detailed definition of renal failure. Consideration should be given to using the RIFLE criteria.
5. 2a.8 Denominator Details: Are re-operated patients included?
6. 4e.2 Costs to Implement the Measure: The cost of data abstraction needs to be clearer.

Developer Response:

1. Data on disparities are provided in the form.
2. Participation in the STS Database is not required
3. During the hospitalization for surgery, which includes the entire postoperative period up to discharge, even if over 30 days.
4. STS will use the RIFLE criteria in its analyses and report of the renal failure measure. The renal failure section of the STS Adult Cardiac Surgery Database, v2.73 Training Manual will be harmonized with the risk, injury and failure categories of the RIFLE criteria. For cases entered in the STS Database from July 2011 onward, renal failure rates reported quarterly to STS Database Participants will reflect the RIFLE criteria definition. Please note that due to the specification upgrade schedule for the STS Adult Cardiac Surgery Database, the RIFLE categories of loss and ESKD cannot be captured at this time. STS intends to make these changes during the next specification upgrade scheduled to take place in 2013.
    New numerator details:
    Definition of renal failure/dialysis requirement – Patients with acute renal failure or worsening renal function resulting in one or both of the following:
    - Increase of serum creatinine to ≥ 4.0 or 3x the most recent preoperative creatinine level
    - New requirement for dialysis postoperatively
5. Yes, re-operated patients are included
6. Approximately one FTE per 500 cases

Steering Committee Follow-up:

The Steering Committee agreed that the response from the developer was adequate, including that related to the fact that long term data from use of the RIFLE criteria will not be available until sometime after

0114 Risk-adjusted post-operative renal failure
implementation.
1. Importance to Measure and Report: Y-22; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Patients with post-operative renal failure are a high-risk group.
2. Scientific Acceptability of Measure Properties: C-3; P-18; M-1; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** Specifications were incomplete. There is no stated numerator time window. Without a specified time period, this becomes open to interpretation by coders. The Committee suggested the developer used the RIFLE criteria when defining renal failure. There was not an exclusion for emergency CABG cases, which are more susceptible to the development of renal failure due to pateints being sicker to begin with and the need for blood transfusions.
3. Usability: C-12; P-9; M-0; N-1 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** This measure seemed valuable from the quality improvement perspective.
4. Feasibility: C-14; P-8; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The cost of data abstraction was not clearly indicated. The developer did not provide the cost of hiring employees to perform data abstraction.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; • support for and against risk adjustment; and • requests to reconsider endorsement based on bundling of outcomes. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. Comments specific to the measure included concern that risk-adjusted post operative renal failure may not be modifiable without affecting other outcomes measures and may be confusing for public reporting. The Steering Committee reaffirmed its endorsement of this measure for quality improvement and public reporting. Bundling complications can add power to the ability for greater discrimination thus there is value in portraying things such as complications in this way. The reporting approach is not delineated though NQF-endorsed® guidance for reporting is included in the report titled National Voluntary Consensus Standards for Public Reporting of Patient Safety Event Information.

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0115 Risk-adjusted surgical re-exploration
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who require a return to the operating room for bleeding with or without tamponade, graft occlusion, valve dysfunction, or other cardiac reason. **Numerator Statement:** Number of patients undergoing isolated CABG who require return to the operating room for mediastinal bleeding with or without tamponade, graft occlusion, valve dysfunction, or other cardiac reason. **Denominator Statement:** All patients undergoing isolated CABG.

0115 Risk-adjusted surgical re-exploration

Exclusions: N/A
Adjustment/Stratification: case-mix adjustment/No stratification is required for this measure.
Level of Analysis: Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities
Type of Measure: Outcome
Data Source: Registry data-STS Adult Cardiac Surgery Database, Version 2.73
Measure Steward: Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611

Steering Committee Recommendation for Endorsement: Y-19; N-0; A-1
Rationale: This is an important internal metric for cardiothoracic surgery practices to help focus supportive efforts on surgical and anesthesia providers with a high rate of required re-operation.

If applicable, Conditions/Questions for Developer:

1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities.
2. 2a.2 Numerator Time Window: Provide the time period in which cases are eligible for inclusion in the numerator.

Developer Response:

1. Data on disparities are provided in the form.
2. During the hospitalization for surgery, which includes the entire postoperative period up to discharge, even if over 30 days.

Steering Committee Follow-up:
The Steering Committee agreed that the response from the developer was adequate.

1. Importance to Measure and Report: Y-22; N-0
(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)
Rationale: Though it is unproven as to whether surgical re-exploration has a direct impact on outcomes; from the patient perspective, an additional surgical procedure is itself an important and adverse outcome.

2. Scientific Acceptability of Measure Properties: C-19; P-3; M-0; N-0
(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)
Rationale: This is easy to measure accurately. The measure has face validity in that any return to the OR is considered a complication of the surgical procedure. The Committee questioned why the return to the OR was only for cardiac reasons. Evidence indicates that approximately 80 percent of the reasons for an OR return is because of bleeding or graft occulusion. The issue of risk adjustment was discussed. It was indicated that the measure should not be risk adjusted. If the measure is risk-adjusted then it is hard to find out exactly which specific conditions or procedure will lead to an OR return.

3. Usability: C-20; P-2; M-0; N-0
(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)
Rationale: The measure is meaningful for public reporting and quality improvement. Committee members discussed the potential of 'gaming' to fullfil the requirements of the measure. The Committee recognized there isn't a way to prevent gaming and trusts that gaming will not become an issue.

4. Feasibility: C-21; P-1; M-0; N-0
(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)
Rationale: All data elements are available electronically.

Public and Member Comments
General Comments included:

- level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and
- support for and against risk adjustment.

The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider

0115 Risk-adjusted surgical re-exploration
clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. Comments specific to the measure suggested it would be more informative to separate re-exploration for bleeding from re-exploration for other causes. The Committee determined this measure addresses surgical re-exploration as a complication of the surgical procedure and acknowledged that bleeding is one of the major causes.

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0129 Risk-adjusted prolonged intubation (ventilation)
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who require intubation for more than 24 hours **Numerator Statement:** Number of patients undergoing isolated CABG who require intubation > 24 hours. **Denominator Statement:** All patients undergoing isolated CABG. **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-15; N-4; A-1 **Rationale:** Intubation is linked to morbidty, and an increase in length-of-stay, cost and resource utilization. The Committee suggested in the future the developer submit a companion measure at the next maintenance review that focuses on the median time to extubation for patients with whom are intubated for less than 24 hours.
If applicable, Conditions/Questions for Developer: 1. De.2 Measure Description: Please consider change in time limit to a period that is less than 24 hours 2. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Considering the increased complexity of current CT patients, a time period significantly less than 24 hrs (e.g. 6 or 12 hours) would not be appropriate as a *routine performance measure*, even though that is achievable in many patients. In some patients, such a measure could result in the adverse unintended consequences of premature extubation, subsequent ventilatory failure, and re-intubation. 2. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate though lacks some discriminatory power and suggested that in the future STS should submit a complementary measure that focuses on appropriate intubation time for patients.
1. Importance to Measure and Report: Y-22; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Although the measure compliance is above 90 percent, the Committee felt compliance should be closer to 100 percent.
2. Scientific Acceptability of Measure Properties: C-17; P-5; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** One potential confounder is the post-CABG patient who is extubatable by clinical criteria but is kept intubated beyond 24 hours due an unrelated unscheduled second surgery the next day. The Committee questioned the developer as to why 24 hours was selected as the standard as opposed to a shorter time period.

0129 Risk-adjusted prolonged intubation (ventilation)
The literature identifies a range of times, associated with length of stay in ICU and hospital as well as relationship to anesthesia. One study reported that 39 percent of all patients were extubated within 6 hours, 89 percent within 24 hours and 95 percent within 48 hours. Committee members indicated that in their experience the majority of patients are off ventilators sooner than 24 hours..
3. Usability: C-20; P-2; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The measure is meaningful for public reporting and quality improvement.
4. Feasibility: C-20; P-1; M-1; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** Easily captured and derived from electronic sources.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement.

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0131 Risk-adjusted stroke/cerebrovascular accident
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who have a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that did not resolve within 24 hours **Numerator Statement:** Number of patients undergoing isolated CABG who have a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that did not resolve within 24 hours. **Denominator Statement:** All patients undergoing isolated CABG. **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-20; N-1; A-0 **Rationale:** It is an important clinical condition to publicly report.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. 2. 2a.2 Numerator Time Window: Provide the time period in which cases are eligible for inclusion in the numerator. 3. 2a.9 Denominator Exclusions: Please reconsider exclusion of patients with prior CVA; suggest this exclusion be removed or rationale for retaining it be provided in more detail. **Developer Response:**

0131 Risk-adjusted stroke/cerebrovascular accident

1. Data on disparities are provided in the form.
2. During the hospitalization for surgery, which includes the entire postoperative period up to discharge, even if over 30 days.
3. STS will remove this exclusion. STS adjusts for prior CVA in the STS risk model.

Steering Committee Follow-up:
The Steering Committee agreed that the response from the developer was adequate.

1. Importance to Measure and Report: Y-22; N-0
(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)
Rationale: Measuring the number of patients whose postoperative stroke was not resolved within 24 hours will provide the opportunity to improve quality of care. With 1.0 as the median, STS data shows an incidence range from 0.6 – 2.1 with 1.2 and 0.8 at the 25th and 75th quartiles respectively. Up to a 13+ percent incidence of stroke has been reported.

2. Scientific Acceptability of Measure Properties: C-12; P-10; M-0; N-0
(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)
Rationale: This measure has significant face validity. Because it is a low-incidence event, large numbers are required for effective interpretation. The reproducibility of reporting centers from year to year is low. A center could have an excellent score one year and a bad score the following year. There was concern as to whether this truly represents the care at individual hospitals. The Committee questioned how the exclusion of a prior CVA is calculated. The Committee recommended that patients with a prior CVA should be included to see if prior CVA had worsened as a result of the CABG operation.

3. Usability: C-17; P-5; M-0; N-0
(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)
Rationale: Useful as a measure where the data is aggregated nationally. Due to this being a low frequency event, it will be hard to directly apply the results at the provider level or in an individual practice or hospital though it can prove useful as a trigger tool.

4. Feasibility: C-18; P-4; M-0; N-0
(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)
Rationale: The Committee was not sure how well automated electronic data (such as ICD-9 codes) can be used to define this measure. Cognitive defects can be subtle, and may require more focused testing that would increase the cost of data collection and complexity of this measure.

Public and Member Comments
General Comments included:

- level of analysis should be reported at the individual surgeon level when sample sizes are sufficient;
- support for and against risk adjustment; and
- requests to reconsider endorsement based on bundling of outcomes.

The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement.

Comments specific to the measure included concern that risk-adjusted stroke/cerebrovascular accident may not be modifiable without affecting other outcomes measures and may be confusing for public reporting.
The Steering Committee reaffirmed its endorsement of this measure for quality improvement and public reporting. Bundling complications can add power to the ability for greater discrimination thus there is value in portraying things such as complications in this way. The reporting approach is not delineated though NQF-

0131 Risk-adjusted stroke/cerebrovascular accident
endorsed® guidance for reporting is included in the report titled National Voluntary Consensus Standards for Public Reporting of Patient Safety Event Information.

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0119 Risk-adjusted operative mortality for CABG
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who die, including both 1) all deaths occurring during the hospitalization in which the CABG was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Numerator Statement:** Number of patients undergoing isolated CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure **Denominator Statement:** All patients undergoing isolated CABG. **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-19; N-1; A-0 **Rationale:** Mortality is an important concept to measure and report.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-21; N-1 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Understanding how to prevent mortality will provide better clinical outcomes. Data from the STS database reviewed and published reports a 30 day operative death rate of 3.05% and suggests that such site specific data can be useful to evaluate care quality and focus on areas for improvement. The developer was asked to provide data regarding disparities that will be considered prior to final action by the committee.
2. Scientific Acceptability of Measure Properties: C-17; P-5; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The Committee discussed the risk-adjusted mortality rate and if it identified whether patients who should be doing well are actually doing well within institutions. The Committee expressed interest in being able to obtain the volume of surgeries performed in an institution stratified in terms of actual risk for individual patients and whether those patients who, statistically, are expected to survive actually survive. The measure does not consider the volume of the programs.
3. Usability: C-20; P-2; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The measure is meaningful and useful for public reporting and quality improvement.
4. Feasibility: C-20; P-2; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The data can be derived from electronic sources.

0119 Risk-adjusted operative mortality for CABG
Public and Member Comments: General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement.

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0120 Risk-adjusted operative mortality for aortic valve replacement (AVR)
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing Aortic Valve Replacement (AVR)who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure **Numerator Statement:** Number of patients undergoing AVR who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure **Denominator Statement:** All patients aged 18 years and older undergoing isolated AVR surgery. **Exclusions:** N/A. **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-19; N-1; A-0 **Rationale:** Aortic valve replacement is a high risk surgery and factors that can improve outcomes can be studied from this measure.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-20; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Important measure for determining the delivery of care in a cardiac program. The summary of evidence of high impact is strong.
2. Scientific Acceptability of Measure Properties: C-20; P-1; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** Specifications are well defined and the risk adjustment methodology is appropriate and clearly described.
3. Usability: C-20; P-1; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)*

0120 Risk-adjusted operative mortality for aortic valve replacement (AVR)
Rationale: The measure is straightforward and easy to understand. It is focused on one, clearly defined procedure, and the outcome (mortality) is determined by multiple contributing factors that when identified can be targets of quality improvement initiatives. This measure is currently not being publicly reported; reporting is expected within 12 months.
4. Feasibility: C-21; P-0; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The data capture process for the database is extensive and well constructed.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee supported changes to the measure descriptions and denominator statements that were requested. Comments specific to the measure included a request that age specification be included in the measure description and denominator statements. The Steering Committee supported the change and the measure developer agreed to modify the measure descriptions and denominator statements to include age specifications.

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0121 Risk-adjusted operative mortality for mitral valve (MV) replacement
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing MV replacement who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Numerator Statement:** Number of patients undergoing MV replacement who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Denominator Statement:** All patients aged 18 years and older undergoing isolated MV replacement surgery. **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-19; N-1; A-0 **Rationale:** The measure was well defined and constructed providing ability to drill down for information regarding in hospital and post discharge deaths. Having such data at the levels of analysis can help planning toward strategies to prevent mortality and ultimately provide better clinical outcomes.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:**

0121 Risk-adjusted operative mortality for mitral valve (MV) replacement
1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-21; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** The procedure is important to measure and report. Having the ability to review organizational performance against that of peers and against oneself over time has been shown to facilitate insights that can result in improvement in risk assessment, patient selection and ultimately outcomes.
2. Scientific Acceptability of Measure Properties: C-20; P-1; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The specifications are well defined.
3. Usability: C-21; P-0; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The measure is straightforward and easy to understand. This measure is currently not being publicly reported; reporting is expected within 12 months.
4. Feasibility: C-21; P-0; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The data is derived from electronic sources.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and, • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee supported changes to the measure descriptions and denominator statements that were requested. Comments specific to the measure included a request that age specification be included in the measure description and denominator statements. The Steering Committee supported the change and the measure developer agreed to modify the measure descriptions and denominator statements to include age specifications.

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0122 Risk-adjusted operative mortality MV replacement + CABG surgery
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing combined MV replacement and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Numerator Statement:** Number of patients undergoing combined MV replacement and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Denominator Statement:** All patients aged 18 years and older undergoing combined MV replacement + CABG.

0122 Risk-adjusted operative mortality MV replacement + CABG surgery
Exclusions: N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-19; N-1; A-0 **Rationale:** Signifcant procedure in cardiac surgery.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-19; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Important measure for the relatively small number of centers that perform this type of surgery given the increasing use in an older population with greater numbers and more severe co-morbid risk factors.
2. Scientific Acceptability of Measure Properties: C-16; P-3; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The measure is precisely specified.
3. Usability: C-16; P-3; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The question of whether the measure is useful due to the small number of centers that perform the surgery was discussed and decided in favor of the measure's use. This measure is currently not being publicly reported; reporting is expected within 12 months.
4. Feasibility: C-18; P-1; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** Audit process is well structured.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee supported changes to the measure descriptions and denominator statements that were requested. Comments specific to the measure included a request that age specification be included in the measure description and denominator statements. The Steering Committee supported the change and the measure developer agreed to modify the measure descriptions and denominator statements to include age specifications.

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0123 Risk-adjusted operative mortality for aortic valve replacement (AVR) + CABG surgery
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing combined AVR and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Numerator Statement:** Number of patients undergoing combined AVR and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Denominator Statement:** All patients aged 18 years and older undergoing combined AVR + CABG. **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-19; N-1; A-0 **Rationale:** The performance gap varies by facility.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-20; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** It is a critical outcome that varies in performance.
2. Scientific Acceptability of Measure Properties: C-18; P-2; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** A higher risk population is undergoing this surgery; the case mix risk model is appropriate for the population. The reliability and validity testing will allow organizations to provide consistent and credible results
3. Usability: C-19; P-2; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** This measure is currently not being publicly reported; strategy for reporting puts CABG procedures out first with other to follow. This and related measures are expected to be publicly reported within 24-36 months.
4. Feasibility: C-21; P-0; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The information can be derived from electronic sources.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small

0123 Risk-adjusted operative mortality for aortic valve replacement (AVR) + CABG surgery
sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee supported changes to the measure descriptions and denominator statements that were requested. Comments specific to the measure included a request that age specification be included in the measure description and denominator statements. The Steering Committee supported the change and the measure developer agreed to modify the measure descriptions and denominator statements to include age specifications.

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1501 Risk-adjusted operative mortality for mitral valve (MV) repair
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing MV Repair who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. (This measure applies to the procedure of MV repair, regardless of approach) *Note: This measure was formerly endorsed as a component of Measure 0121* **Numerator Statement:** Number of patients undergoing MV repair who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Denominator Statement:** All patients aged 18 years and older undergoing isolated MV Repair surgery (This measure applies to the procedure of MV repair, regardless of approach) **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-21; N-0; A-0 **Rationale:** The measure provides an additive value to measures on cardiac surgical care.
If applicable, Conditions/Questions for Developer: 1. De.2 Measure Description & 2a.4 Denominator Statement: Please clarify that the measure applies to open chest procedures. 2. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. The measure applies to the procedure of MV repair, regardless of approach. 2. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-21; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** This procedure is important to measure and report.
2. Scientific Acceptability of Measure Properties: C-19; P-2; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The measure is precisely specified.
3. Usability: C-19; P-2; M-0; N-0

1501 Risk-adjusted operative mortality for mitral valve (MV) repair
(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures) **Rationale:** The measure is easy to understand.
4. Feasibility: C-21; P-0; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** Easily measured and derived from electronic sources.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee supported changes to the measure descriptions and denominator statements that were requested. Comments specific to the measure included a request that age specification be included in the measure description and denominator statements. The Steering Committee supported the change and the measure developer agreed to modify the measure descriptions and denominator statements to include age specifications.

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1502 Risk-adjusted operative mortality for MV repair + CABG surgery
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing combined MV repair and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. *Note: This measure was formerly endorsed as a component of Measure 0122.* **Numerator Statement:** Number of patients undergoing combined MV repair and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. **Denominator Statement:** All patients aged 18 years and older undergoing combined MV repair + CABG **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-21; N-0; A-0 **Rationale:** Important measure with variation of performance.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:**

1502 Risk-adjusted operative mortality for MV repair + CABG surgery
The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-21: N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Mortality varies for this procedure.
2. Scientific Acceptability of Measure Properties: C-16; P-4; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The measure is precisely specified.
3. Usability: C-20; P-1; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The measure is easy to understand.
4. Feasibility: C-21; P-0; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** Easily measured and derived from electronic sources.
Public and Member Comments Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient; and • support for and against risk adjustment. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee supported changes to the measure descriptions and denominator statements that were requested. Comments specific to the measure included a request that age specification be included in the measure description and denominator statements. The Steering Committee supported the change and the measure developer agreed to modify the measure descriptions and denominator statements to include age specifications.

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0360 Esophageal resection mortality rate (IQI 8)
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Number of inpatient deaths per 100 discharges with a procedure for esophageal resection **Numerator Statement:** Number of deaths among cases meeting the inclusion and exclusion rules for the denominator. **Denominator Statement:** Discharges, age 18 years and older, with ICD-9-CM esophageal resection procedure code and a diagnosis code of esophageal cancer in any field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes. **Exclusions:** Exclude discharges with pregnancy, discharge to a short term hospital or missing information for discharge disposition, age or sex. **Adjustment/Stratification:** case mix adjustment/Observed rates may be stratified by age group, race/ethnicity categories, payer categories and sex. **Level of Analysis:** Facility/Agency **Type of Measure:** Outcome **Data Source:** Electronic administrative data/claims **Measure Steward:** Agency for Healthcare Research and Quality | 540 Gaither Road | Rockville | Maryland |

0360 Esophageal resection mortality rate (IQI 8)
20850
Steering Committee Recommendation for Endorsement: Y-20; N-0; A-0 **Rationale:** Numerous studies have demonstrated a high variability in surgical mortality, largely influenced by hospital volume. The adoption of such a measure would encourage quality improvement at low-volume centers, or patients seeking care at centers with better results. Continued measurement and reporting of this measure is warranted as it will help advance the understanding of variations in outcome for esophageal resection and identify best practices. For reporting, this measure is to be paired with 0361, Esophageal resection volume . In considering potential harmonization with NQF-endorsed™ Measure 0737, Survival predictor for esophagectomy surgery, the Committee determined that the measure differences support maintaining the measures without harmonization work at this time.
If applicable, Conditions/Questions for Developer: Endorsement recommendation is based on developer commitment to ensure that the 0360 and 0361 are harmonized and reported as a pair.
1. Importance to Measure and Report: Y-18; N-4 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Esophagectomy for cancer carries a high risk of mortality given the magnitude of the procedure and the high risk population in which it is performed.
2. Scientific Acceptability of Measure Properties: C-3; P-16; M-2; N-1 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** While this is an important measure, the relatively low volume of esophagectomies performed on an annual basis will make inter-hospital comparisons statistically difficult, especially for low-volume centers.
3. Usability: C-6; P-13; M-1; N-2 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The Committee discussed the issue of low-volume centers and if their mortality could adequately predict future mortality. Concerns of consumers misinterpreting the data of low-volume centers were expressed.
4. Feasibility: C-17; P-4; M-1; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The information is derived from electronic administrative data/claims.
Public and Member Comments No comments were received on this measure.

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0361 Esophageal resection volume (IQI 1)
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Number of discharges with a procedure for esophageal resection. **Numerator Statement:** Discharges, age 18 years and older, with ICD-9-CM code for esophageal resection in any procedure field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes. **Denominator Statement:** N/A **Exclusions:** N/A **Adjustment/Stratification:** no risk adjustment necessary/No stratification is required for this measure. **Level of Analysis:** Facility/Agency **Type of Measure:** Structure/management **Data Source:** Electronic administrative data/claims **Measure Steward:** Agency for Healthcare Research and Quality | 540 Gaither Road | Rockville | Maryland | 20850
Steering Committee Recommendation for Endorsement: Y-20; N-0; A-0 **Rationale:** Numerous studies have demonstrated high variability in surgical mortality, largely influenced by hospital volume. The adoption of such a measure would encourage quality improvements at low-volume

0361 Esophageal resection volume (IQI 1)
centers, or patients seeking care at centers with better results. Continued measurement and reporting of this measure is warranted as it will help advance our understanding of variations in outcome for esophageal resection and identify best practices. For reporting, this measure is to be paired with 0360, Esophageal resection mortality rate..
If applicable, Conditions/Questions for Developer: Endorsement recommendation is based on developer commitment to ensure that the 0360 and 0361 are harmonized and reported as a pair.
1. Importance to Measure and Report: Y-18; N-4 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Esophagectomy for cancer carries a high risk of mortality given the magnitude of the procedure and the high risk population in which it is performed.
2. Scientific Acceptability of Measure Properties: C-8; P-11; M-3; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** Mortality rates provide more valuable information than volume. The Committee questioned if this measure was necessary since volume is a proxy for mortality and decided the measure is appropriately used and reported but should remain paired with 0360 and not reported as a stand-alone.
3. Usability: C-7; P-14; M-1; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** Concerns of consumers misinterpreting the data of low-volume centers were expressed.
4. Feasibility: C-17; P-5; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The information is derived from electronic administrative data/claims.
Public and Member Comments No comments were received on this measure.

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0116 Anti-platelet medication at discharge
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on anti-platelet medication. **Numerator Statement:** Number of patients undergoing isolated CABG who were discharged on anti-platelet medication. **Denominator Statement:** All patients undergoing isolated CABG. **Exclusions:** Cases are removed from the denominator if there was an in-hospital mortality or if discharge aspirin was contraindicated. In other words, if discharge aspirin is marked contraindicated or there is an in-hospital mortality, the patient is excluded from the denominator, and therefore, the measure is calculated without those patients. **Adjustment/Stratification:** no risk adjustment necessary/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Process **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-20; N-0; A-0 **Rationale:** Though the measure has been in use for multiple years, there is still a performance gap; provider organizations ranges from 85-100 percent.
If applicable, Conditions/Questions for Developer:

0116 Anti-platelet medication at discharge

1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities.
2. 2a Measure Specifications: When are denominator exclusions with respect to calculating the numerator?
3. 2a.2 Numerator Time Window: Provide the time period in which cases are eligible for inclusion in the numerator.
4. Indicate acceptability of Plavix/clopidogrel, where applicable, throughout. The numerator statement includes anti-platelet medications; however, the denominator excludes those with an aspirin contraindication. Is a patient who is on Plavix because of an aspirin contraindication counted in the numerator or excluded from the denominator?

Developer Response:

1. Data on disparities are provided in the form.
2. If discharge aspirin is marked contraindicated or there is an in-hospital mortality, the patient is excluded from the denominator, and therefore, the measure is calculated without those patients.
3. Indicated in the measure
4. Existing numerator details state that either discharge aspirin or ADP inhibitors are acceptable. If a patient is on Plavix due to an aspirin contraindication, s/he is counted in the numerator because STS accepts either ASA or ADP inhibitors for the numerator (i.e., Number of isolated CABG procedures in which discharge aspirin [DCASA] or discharge ADP inhibitors [DCADP] is marked "yes").

Steering Committee Follow-up:

The Steering Committee agreed that the response from the developer was adequate.

1. Importance to Measure and Report: Y-21; N-0

(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)

Rationale: The use of anti-platelet therapy at discharge is currently an accepted standard of care to improve bypass graft patency and promote secondary prevention of coronary artery disease and performance gap remains.

2. Scientific Acceptability of Measure Properties: C-18; P-3; M-0; N-0

(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)

Rationale: The Committee was uncertain as to when exclusions were applied. The Committee questioned if Plavix was an acceptable alternative if aspirin is contraindicated.

3. Usability: C-21; P-0; M-0; N-0

(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)

Rationale: The measure is currently widely used both as a CMS PQRI measure (measure 169) and at hospitals that are participating in the STS Adult Cardiac Surgery Database providing information that providers can use to analyze and improve anti-platelet use practices.

4. Feasibility: C-20; P-1; M-0; N-0

(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)

Rationale: The measure can be easily implemented.

Public and Member Comments

General Comments included:

- level of analysis should be reported at the individual surgeon level when sample sizes are sufficient.

The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement.

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0118 Anti-lipid treatment discharge
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on a statin or other lipid-lowering regimen. **Numerator Statement:** Number of patients undergoing isolated CABG who were discharged on a statin or other lipid-lowering regimen. **Denominator Statement:** All patients undergoing isolated CABG. **Exclusions:** Cases are removed from the denominator if there was an in-hospital mortality or if discharge anti-lipid treatment was contraindicated. **Adjustment/Stratification:** no risk adjustment necessary/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Process **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-20; N-0; A-0 **Rationale:** Although the current compliance rate is 98 percent, there is still regional variation where performance is low.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-21; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Strong clinical evidence indicates that a lipid-lowering regime is of benefit to patients post-CABG.
2. Scientific Acceptability of Measure Properties: C-20; P-1; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** Specifications are well defined. Reliability and validity testing results are reported with rates of p=0.76 and 96.5% agreement respectively.
3. Usability: C-20; P-0; M-1; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The Committee would like to see an increase in utilization of the measure and eventually become a standard practice of care.
4. Feasibility: C-21; P-0; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The measure can be easily implemented.
Public and Member Comments General Comments included: • level of analysis should be reported at the individual surgeon level when sample sizes are sufficient. The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be

0118 Anti-lipid treatment discharge
generated at the group or hospital level for use in quality improvement.

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0130 Risk-adjusted deep sternal wound infection rate
For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings
Description: Percent of patients aged 18 years and older undergoing isolated CABG who, within 30 days postoperatively, develop deep sternal wound infection involving muscle, bone, and/or mediastinum requiring operative intervention. **Numerator Statement:** Number of patients who, within 30 days postoperatively, develop deep sternal wound infection involving muscle, bone, and/or mediastinum requiring operative intervention. Must have all of the following conditions: - Wound opened with excision of tissue (I&D) or re-exploration of mediastinum - Positive culture unless patient on antibiotics at time of culture or no culture obtained - Treatment with antibiotics beyond perioperative prophylaxis **Denominator Statement:** All patients undergoing isolated CABG **Exclusions:** N/A **Adjustment/Stratification:** case-mix adjustment/No stratification is required for this measure **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Outcome **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: Y-19; N-0; A-1 **Rationale:** There is an opportunity for improvement due to the presence of variation within the performance gap.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. **Developer Response:** 1. Data on disparities are provided in the form. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate.
1. Importance to Measure and Report: Y-21; N-0 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** There is significant morbidity and mortality associated with this condition.
2. Scientific Acceptability of Measure Properties: C-20; P-1; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The measure is important based on surgical wound infection as an important indicator of performance; the specifications are clearly and fully defined. The 30 day time interval for occurrence of sternal wound infection is appropriate.
3. Usability: C-19; P-2; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** STS reports it has worked to harmonize its definition of surgical site infection with CDC's definition and has done so except with respect to the time interval. At present, STS believes the 30 day time interval for the measure vs. the CDC 12 months outer limit is most appropriate.
4. Feasibility: C-19; P-2; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The measure can be easily implemented.

0130 Risk-adjusted deep sternal wound infection rate

Public and Member Comments

General Comments included:

- level of analysis should be reported at the individual surgeon level when sample sizes are sufficient;
- support for and against risk adjustment; and
- request for transparency of the validation methodology.

The Steering Committee discussed the level of analysis and was sensitive to a number of issues that should be considered as organizations determine how measures should be structured and reported, including small sample sizes and potential for risk aversion. The Steering Committee stated it was appropriate to consider clinician level reporting where appropriate after consideration of the attendant issues. It noted that it was important for measures to take into account patient risk factors while ensuring that variations in care are not obscured by risk adjustment. It also clarified with the developer that individual clinician information can be generated at the group or hospital level for use in quality improvement. The Steering Committee agreed that transparency is important for all users' proper use and understanding of the measure and results of its use.

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0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time

For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings

Description: Percentage of surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time

Numerator Statement: Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to Surgical Incision Time to 24 hours after Surgery End Time

Appropriate prophylaxis according to Surgery Type:

Intracranial Neurosurgery

Any of the following:

• Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS)
• Low-dose unfractionated heparin (LDUH)

Low molecular weight heparin (LMWH)2

• LDUH or LMWH2 combined with IPC or GCS

General Surgery

Any of the following:

• Low-dose unfractionated heparin (LDUH)
• Low molecular weight heparin (LMWH)
• Factor Xa Inhibitor (Fondaparinux)
• LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS

General Surgery with a reason for not administering pharmacological prophylaxis

Any of the following:

• Graduated Compression stockings (GCS)
• Intermittent pneumatic compression devices (IPC)

Gynecologic Surgery

Any of the following:

• Low-dose unfractionated heparin (LDUH)
• Low molecular weight heparin (LMWH)
• Factor Xa Inhibitor (fondaparinux)
• Intermittent pneumatic compression devices (IPC)
• LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS

Urologic Surgery

Any of the following:

• Low-dose unfractionated heparin (LDUH)
• Low molecular weight heparin (LMWH)
• Factor Xa Inhibitor (fondaparinux)
• Intermittent pneumatic compression devices (IPC)

0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time

• Graduated compression stockings (GCS)
• LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
Elective Total Hip Replacement
Any of the following started within 24 hours of surgery:
• Low molecular weight heparin (LMWH)
• Factor Xa Inhibitor (Fondaparinux)
• Warfarin
Elective Total Knee Replacement
Any of the following:
• Low molecular weight heparin (LMWH)
• Factor Xa Inhibitor (Fondaparinux)
• Warfarin
• Intermittent pneumatic compression devices (IPC)
• Venous foot pump (VFP)
Hip Fracture Surgery
Any of the following:
• Low-dose unfractionated heparin (LDUH)
• Low molecular weight heparin (LMWH)
• Factor Xa Inhibitor (Fondaparinux)
• Warfarin
Elective Total Hip Replacement with a reason for not administering pharmacological prophylaxis
Any of the following:
• Intermittent pneumatic compression devices (IPC)
• Venous foot pump (VFP)
Hip Fracture Surgery with a reason for not administering pharmacological prophylaxis
Any of the following:
• Graduated Compression Stockings (GCS)
• Intermittent pneumatic compression devices (IPC)
• Venous foot pump (VFP)
Denominator Statement: All selected surgery patients.
Exclusions: Data elements: clinical trial, laparoscope, perioperative death, preadmission warfarin, reason for not administering VTE prophylaxis
Adjustment/Stratification: no risk adjustment necessary/No stratification except by surgery type and those are Intracranial Neurosurgery Appendix A,Table 5.17
General Surgery Appendix A, Table 5.19
Gynecologic Surgery Appendix A, Table 5.20
Urologic Surgery Appendix A,Table 5.21
Elective Total Hip Replacement Appendix A,Table 5.22
Elective Total Knee Replacement Appendix A,Table 5.23
Hip Fracture Surgery Appendix A,Table 5.24
Level of Analysis: Facility/Agency; Program: QIO; can be measured at all levels
Type of Measure: Process
Data Source: Electronic clinical data; electronic health/medical record; paper medical record/flow-sheet. Vendor tools or CART. CART is available for download free at http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=1138900279093
Measure Steward: Centers for Medicare & Medicaid Services | 7500 Security Boulevard | Baltimore | Maryland | 21244

Steering Committee Recommendation for Endorsement: Y-17; N-2; A-1
Rationale: The large number of patients at risk and rate of death demonstrates the importance of continuing to strive for 100 percent compliance since VTE is one of the most common preventable causes of hospital death with about 1/3 of such occurrences being fatal. In discussion of potential harmonization of related measure

0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time

0371, the Committee agreed that the differences in populations, and guidelines for prophylaxis for those populations, warrant continuation of both measures as specified at present; however, members requested that the population of patients targeted by the measures be further reviewed for harmonization by the next maintenance review of the measures.

If applicable, Conditions/Questions for Developer:

1. 2a Measure Specifications: The length-of-stay indicated in the form is inconsistent. Length-of-stay is listed as three calendar days in some areas of the form and 24 hours in other areas.
2. 2a.3 Numerator Details: Provide a more detailed definition of what constitutes 'appropriate VTE prophylaxis' and attempt to reconcile ACCP guidelines with other evidence based guidelines for relevant populations (e.g. AAOS for orthopedic procedures).
3. 2a.10 Denominator Exclusion Details: Provide a more detailed definition of the laparoscopic exclusion or remove laparoscopic procedures from the denominator exclusions.

Developer Response:

1. The numerator time window (section 2a.2) is 24 hours prior to incision to 24 hours after surgery end time. Included in the measure submission is an exclusion statement "Patients with hospital length of stay less than or equal to 3 calendar days" that was not consistent with the exclusion statements in the paired measure, #217. All of the information about length of stay in #218 is correct. Measure #217 contains an incorrect statement about length of stay, but that measure is not being considered for re-endorsement, so it will not be corrected.
2. The submission form requests a link to the specifications and specifically recommends against the use of attachments. The Measure Information Form on the QualityNet website provides a very detailed table listing the procedure type and the appropriate VTE prophylaxis. That table is below. The recommendations in the measure are based on Level I evidence, per the ACCP Guidelines. The AAOS has this recommendation for prevention of symptomatic PE in patients undergoing hip/knee arthroplasty, with a Level III rating. *The use of aspirin as a monotherapy is the only recommendation that does not agree with the ACCP Guidelines.* The recommendation from AAOS is listed below:
   Recommendation 3.3
   Chemoprophylaxis of patients undergoing hip or knee replacement
   Recommendation 3.3.1
   Patients at standard risk of both PE and major bleeding should be considered for one of the chemoprophylactic agents evaluated in this guideline, including—in alphabetical order: Aspirin, low molecular-weight heparin (LMWH), synthetic pentasaccharides, and warfarin. (Level III, Grade B [choice of prophylactic agent], Grade C [dosage and timing])
   Note: The grade of recommendation was reduced from B to C for dosage and timing because of the lack of consistent evidence in the literature defining a clearly superior regime.
3. The exclusion for laparoscopic procedures is being removed for discharges beginning 1/1/2012.

Steering Committee Follow-up:

The Steering Committee agreed that the response from the developer was adequate. The Steering Committee expressed that in the future they would like to see ACCP and AAOS work together to create appropriate and standardized guidelines.

1. Importance to Measure and Report: Y-20; N-0
(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)
Rationale: Performance in qtr 1, 2010 was 92.5%, up from 69.79% in 2005 with significant remaining opportunity for improvement. Studies have indicated that the number one cause of 30-day mortality in cancer patients after surgery is related to venous thromboembolism.

2. Scientific Acceptability of Measure Properties: C-6; P-13; M-1; N-0
(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)
Rationale: The numerator is not harmonized with other evidence-based guidelines. Laparoscopic surgery is not well defined and should be removed from the list of exclusions as they are high risk patients.

3. Usability: C-9; P-11; M-0; N-0

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(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures) **Rationale:** The data sources include electronic clinical data, the electronic medical record where in use and paper medical record abstraction. It is in use in U.S. hospitals receiving Medicare reimbursement nationally.
4. Feasibility: C-13; P-7; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The measure can be easily implemented.
Public and Member Comments Comments included: • identify age group in the measure description and denominator statements • change "Factor Xa Inhibitor (Fondaparinux)" to "Factor Xa Inhibitor with VTE prophylaxis indication" to create more flexibility in the measure; • clarify "appropriate venous thromboembolism prophylaxis"; and • include otolaryngology-head and neck surgery procedures in measure specifications. The Steering Committee supported the change proposed by the measure developer with respect to integrating language into the specification to allow abstractors to select a pharmacologic agent that may be newly approved for a clinical indication; accepts the rationale for not including prophylaxis for head and neck surgery at this time; and encouraged the developer to make the requested change to the measure descriptions and denominator.

Candidate Consensus Standards Recommended for Endorsement and Placement in Reserve Status

One measure was recommended for continued endorsement and placement in "reserve status". [12]

The evaluation summary table lists the measure and summarizes the results of the Steering Committee's evaluation of and voting on the candidate consensus standard that is recommended for continued endorsement and placement in reserve status and the subsequent public and NQF member comments. Hyperlinks are provided:

- from the listed measure to the evaluation summary table;
- from the summary table to the web page where all materials submitted by the developer or steward are posted; and
- from the summary table to the web page where the meeting and call summaries, transcripts, and recordings can be accessed.

The Steering Committee recommended the following candidate consensus standard for continued endorsement and placement in reserve status.

Cardiac-CABG

Evaluation Summary—Candidate Consensus Standards Recommended for Endorsement and Placement in Reserve Status

0113 Participation in a systematic database for cardiac surgery

For More Information: Detailed Measure Specifications; Complete Measure Submission; Meeting/Call Proceedings

Description: Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data.
Numerator Statement: Does the facility participate in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data? (y/n).
Denominator Statement: N/A
Exclusions: N/A
Adjustment/Stratification: no risk adjustment necessary/No stratification is required for this measure.
Level of Analysis: Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities
Type of Measure: Structure/management
Data Source: Registry data-STS Adult Cardiac Surgery Database, Version 2.73
Measure Steward: Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611

Steering Committee Recommendation for Endorsement: Reserve Status Y-20; N-0; A-1
Rationale: Participation in a registry allows benchmarking of data and leads to quality improvement. At present, 95 percent of eligible institutions participate in the registry; this number has remained at a high level over time. Additionally, the data drawn from the registry is used to report quality performance of the institutions for a number of process and outcome measures. Consideration of related measures 0456, Participation in a systematic national database for general thoracic surgery and 0493, Participation by a hospital, physican or other clinician in systematic clinical database registry that includes consensus endorsed quality measures was overtaken by the recommendation for reserve status.

If applicable, Conditions/Questions for Developer:

1. De.2 Measure Description: Please provide a more detailed description that addresses requirement for participation in the STS database/registry.
2. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities.
3. 2a.1 Numerator Statement: The statement does not indicate participation in the STS database is required.
4. 2a.3 Numerator Details: Are hospitals required to report 100% of cases? Please define what qualifies as participation in the registry.

Developer Response:

1. Participation in the STS Database is not required. Measure description will read: Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data
2. STS is not sure how to provide disparities data on this measure. If NQF is interested, STS can provide the number of STS Participants who report data on at least one patient in each subgroup (e.g., male, female, white, etc), but this information would look very similar to the data already provided in the measure form
3. Participation in the STS Database is not required. Numerator statement has been modified to read: Whether or not the facility participates in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data.
4. Numerator Details: Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data. For example, as described in the measure form, participation in the STS Adult Cardiac Surgery Database is initiated by the surgeons and/or hospital and is defined as quarterly submission of 100% of cases via an approved software system to the Duke Clinical Research Institute. STS's audit cross-checks submitted cases against hospital logs to assure all cases have been captured.

Steering Committee Follow-up:
The Steering Committee agreed that the response from the developer was adequate. The Steering Committee

0113 Participation in a systematic database for cardiac surgery
stated the revised description supported the importance of broad database registries, while appropriately avoiding endorsement of a specific vendor. The summary of data disparities was not provided, but it was suggested that the developer could provide additional information regarding characteristics of organizations that participate in the registry and whether the organizations that did not participate had any commonalities.
1. Importance to Measure and Report: Y-18; N-4 (1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence) **Rationale:** Participation in the database for benchmarking and quality improvement has been shown to improve outcomes and enhance patient safety. Although 90 pecent of centers already report, the Committee felt that participation should be closer to 100 percent.
2. Scientific Acceptability of Measure Properties: C-4; P-15; M-1; N-2 (2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities) **Rationale:** Participation in the registry was not defined. The Committee questioned if submitting one case fullfil the criteria requirement or is an organization required to submitt 100 percent of their cases in order to meet the requirement.
3. Usability: C-9; P-13; M-0; N-0 (3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures) **Rationale:** The Committee questioned if the measure remains useful with the addition of other indicators that are dependent upon participation.
4. Feasibility: C-17; P-5; M-0; N-0 (4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented) **Rationale:** All data elements are available electronically.
Public and Member Comments Comments included: • support for "reserve status"; and • question about whether the measure meets the NQF criterion of Importance to Measure and Report because it has a performance level of 95% for participating institutions and lack of convincing evidence of a strong link between participating in a clinical registry and quality of care. The Steering Committee noted that registries continue to provide a way to collect, benchmark, and report back to participants to facilitate appreciation of levels of performance and potential for improvement. To address the situation where reliable, valid and important measures have high levels of performance with little variability, NQF offers "inactive endorsement with reserve status" to retain endorsement so that performance could be monitored in the future to ensure that performance does not decline. The Committee affirmed its recommendation that this measure be placed in reserve status.

Candidate Consensus Standards Pending Final Recommendation for Endorsement

The Steering Committee strongly favored two other measures for continued endorsement, pending the submission of changes that the measure developers need additional time to address. Final action on these measures will occur during Phase II of the project.

Evaluation summary tables that include developer changes -follow the list of measures and summarize the results of the Steering Committee's evaluation of and voting on the candidate consensus standards and subsequent public and NQF member comments that are to be considered for continued endorsement in Phase II. Hyperlinks are provided:

- from each listed measure to the evaluation summary table;
- from each summary table to the web page where all materials submitted by the developer or steward are posted; and
- from each summary table to the web page where the meeting and call summaries, transcripts, and recordings can be accessed.

The Steering Committee will further consider the following candidate consensus standards for endorsement during Phase II.

Cardiac—CABG

Cardiac—CABG ~~and Prophylaxis~~

Evaluation Summary—Candidate Consensus Standards Pending Final Recommendation for Endorsement

0134 Use of internal mammary artery (IMA) in coronary artery bypass graft (CABG)
For More Information: Complete Measure Submission; Meeting/Call Proceedings
Description: Percentage of patients aged 18 years and older undergoing isolated coronary artery bypass graft (CABG) who received an internal mammary artery (IMA) graft. **Numerator Statement:** Number of patients undergoing isolated coronary artery bypass graft (CABG) who received an internal mammary artery (IMA) graft. **Denominator Statement:** All patients undergoing isolated CABG. **Exclusions:** Cases are removed from the denominator if the patient had a previous CABG prior to the current admission or if IMA was not used and one of the following reasons was provided: - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease **Adjustment/Stratification:** no risk adjustment necessary/No stratification ~~is required for this measure~~. **Level of Analysis:** Clinicians: Group/Practice, Clinician: Individual, Clinician: Facility, Population: County or City, Population: National, regiona, state **Type of Measure:** Process **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611

0134 Use of internal mammary artery (IMA) in coronary artery bypass graft (CABG)
Steering Committee Recommendation for Endorsement: Pending harmonization of 0134 and 0516 **Rationale:** This measure is tied to improved outcomes due to high patency rates of the IMA. The current compliance is 95 percent; however variation among programs exists; i.e., compliance rates as low as 80 percent. Final recommendation will be included in the phase II report.
If applicable, Conditions/Questions for Developer: 1. 1b.4 Summary of Data on Disparities by Population Group: Please provide data on disparities. 2. 2a.9 Denominator Exclusions: Please remove "the IMA is not a suitable conduit due to size or flow" from the exclusions. **Developer Response:** 1. Data on disparities are provided in the form. 2. STS staff agreed to remove the exclusion related to IMA suitability during the Steering Committee meeting. The form was modified to reflect this. **Steering Committee Follow-up:** The Steering Committee agreed that the response from the developer was adequate. **Additional Conditions/Questions for Developer:** Harmonization: As agreed, please harmonize measures 0134 and 0516 by combining into a single measure, which can allow reporting at the provider or institution level.
1. Importance to Measure and Report: Y-20; N-1 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** The literature points to disparities amongst women, with IMA used less often in women. The developer did not provide information or data on disparities related to performance on the measure.
2. Scientific Acceptability of Measure Properties: C-14; P-7; M-0; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The exclusion 'IMA not suitable,' can lead to the issue of gaming. This causes apprehension as to who determines if the IMA is not suitable. Currently, there is no criteria that classifies the IMA as suitable. The Committee requested this exclusion be removed.
3. Usability: C-20; P-1; M-0; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The information obtained is meaningful and useful.
4. Feasibility: C-20; P-1; M-0; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The information can be derived from electronic sources.
Public and Member Comments No comments were received on this measure.

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0300 Cardiac surgery patients with controlled ~~6 am~~ postoperative ~~serum~~ blood glucose
For More Information: Complete Measure Submission; Meeting/Call Proceedings
Description: ~~Percentage of c~~Cardiac surgery patients with controlled ~~6 am serum~~ blood glucose (≤~~200~~180 mg/dl) ~~on postoperative day (POD) 1 and POD 2~~in the timeframe of 18 to 24 hours after Anesthesia End Time. **Numerator Statement:** ~~Surgery~~ Cardiac surgery patients with controlled ~~6 am serum~~postoperative blood glucose (≤~~200~~180 mg/dl) ~~on postoperative day (POD) 1 and POD 2~~in the timeframe of 18 to 24 hours after Anesthesia End Time. **Denominator Statement:** Cardiac surgery patients with no evidence of prior infection. Include patients with an ICD-9-CM Principle Procedure code or ICD-9-CM Other Procedure codes of selected surgeries AND an ICD-9-CM for ICD-9-CM codes Principle Procedure code or ICD-9-CM Other Procedure codes of selected surgeries. **Exclusions:** Excluded Populations: • Patients less than 18 years of age • Patients who have a length of Stay greater than 120 days

0300 Cardiac surgery patients with controlled ~~6 am~~ postoperative ~~serum~~ blood glucose

- Patients who had a principal diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 5.09 for ICD-9-CM codes)
- Burn and transplant patients (as defined in Appendix A, Tables 5.14 and 5.15 for ICD-9-CM codes)
- ~~Patients whose ICD-9-CM principal procedure was performed entirely by Laparoscope~~
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients who ~~expired perioperatively~~discharged prior to 24 hours after Anesthesia End Time.

Adjustment/Stratification: no risk adjustment necessary/No stratification ~~is required for this measure~~.
Level of Analysis: Facility~~/Agency,~~; Population: national; ~~Program: QIO; can be measured at all levels~~Population: Regional
Type of Measure: Process
Data Source: Electronic administrative data/claims; paper medical record/flow-sheet. Vendor tools or CART. CART is available for download free at http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=1138900279093
Measure Steward: Centers for Medicare & Medicaid Services | 7500 Security Boulevard | Baltimore | Maryland | 21244

Steering Committee Recommendation for Endorsement: Conditional on updated measure submission reflecting change in numerator to patients having cardiac surgery whose highest blood sugar between 18 and 24 hours after surgery is 180mg/dl or less and any other modifications necessitated by that change as well as response to additional question and condition. Final recommendation will be included in the phase II report.
Rationale: Subsequent to developer changing the timeframe from 6 am due to variation in time of surgery, Committee indicated that a more comprehensive measure would involve monitoring a patient's blood glucose over the 18-24 hour period after surgery and allowing a 4 hour window to reduce high glucose levels to ≤ 180mg/dl.

If applicable, Conditions/Questions for Developer:

1. 2a.1 Numerator Statement: The timeframe should be within 24 hours after surgery instead of 6 am.
2. 2a.10 Denominator Exclusion Details: Provide a more detailed definition of perioperative death.

Developer Response:

1. This recommendation was presented to the SCIP Infection TEP on April 6, 2011. The panel accepted changing the measure numerator to patients having cardiac surgery whose highest blood sugar, between 18 and 24 hours after surgery is 180mg/dl or less.
2. Patients that expire during the perioperative period are excluded from this measure, as they should not be held accountable for glucose values on POD 1 or 2. The data element has this definition: The patient expired during the timeframe from surgical incision through discharge from the post anesthesia care/recovery area. Additional abstraction instructions include:
   For patients discharged from surgery and admitted to the PACU: The end of the perioperative period occurs when the patient is discharged from the PACU.
   For patients discharged from surgery and admitted to locations other than the PACU (e.g., ICU): The perioperative period would end a maximum of six hours after arrival to the recovery area.

If applicable, Conditions/Questions for Developer:

1. 2a.1 Numerator Statement: Suggested modification-If serum glucose is above 180 mg/dl, was it decreased within a specific amount of time.
2. 2b Reliability Testing and 2c Validity Testing: Advise what additional testing will need to be completed in light of the suggested modification.

Steering Committee Follow-up:
The Steering Committee agreed that the response from the developer regarding POD was adequate.

1. Importance to Measure and Report: Y-16; N-5
(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)
Rationale: The goal of the measure, to improve patient's blood sugar, is important. Performance at the

0300 Cardiac surgery patients with controlled 6 am postoperative serum blood glucose
aggregate is 93.4 percent; disparity information requested to understand if there are subpopulation disparities.
2. Scientific Acceptability of Measure Properties: C-2; P-12; M-7; N-0 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** There is a need for more flexibility in the timeframe to allow comparability since variation in patient times of departure from the operating room. Both the committee and developer have heard anecdotal reports that clinical staff is leaving patients on insulin drips to meet the criteria of the measure. Assuming this to be accurate, the timeframe change will address such an unintended consequence of the measure.
3. Usability: C-5; P-6; M-10; N-0 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:** The Committee was unsure if this measure would provide additive value if the timeframe remains at 6 am.
4. Feasibility: C-5; P-9; M-7; N-0 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The measure cannot be easily implemented using the current timeframe.
Public and Member Comments Comments included: • recommendation to change the time-frame for glucose control to 8-12 hours post op. The Steering Committee stated that the timeframe was modified based on a recommendation of the Committee to move from the arbitrary 6 am timeframe to an evidence-based timeframe. This was accomplished by a CMS technical panel in consultation with STS where the evidence considered indicated that blood sugars should be controlled by 18 to 24 hours after surgery. Based on the evidence cited, the Steering Committee agreed with the revised timeframe in the measure submission.

Candidate Consensus Standards Not Recommended for Endorsement

The following candidate consensus standards were not recommended for endorsement: two did not meet the importance to measure and report criterion and one had issues other than with the criteria. Seven (transfusion measures) were withdrawn by the measure developer.

The evaluation summary tables follow the list of measures and summarize the results of the Steering Committee's evaluation of and voting on the candidate consensus standards that were not recommended for endorsement. Hyperlinks are provided:

- from each listed measure to the evaluation summary table;
- from each summary table to the web page where all materials submitted by the developer or steward are posted; and
- from each summary table to the web page where the meeting and call summaries, transcripts, and recordings can be assessed.

Evaluation Summary—Candidate Consensus Standards Not Recommended for Endorsement

0124 Surgical volume-a. isolated coronary artery bypass graft (CABG) surgery, b. valve surgery, c. CABG+valve surgery
For More Information: Complete Measure Submission; Meeting/Call Proceedings
Description: Annual procedural volume of three surgeries: isolated CABG surgery, valve surgery, and valve+CABG surgery. **Numerator Statement:** a. number of patients undergoing isolated CABG surgery b. number of patients undergoing heart valve surgery c. number of patients undergoing CABG+valve surgery. **Denominator Statement:** N/A **Exclusions:** N/A **Adjustment/Stratification:** no risk adjustment necessary/No stratification is required for this measure. **Level of Analysis:** Clinicians: Group; Facility/Agency; Population: National, regional/network, states, counties or cities **Type of Measure:** Structure/management **Data Source:** Registry data-STS Adult Cardiac Surgery Database, Version 2.73 **Measure Steward:** Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Steering Committee Recommendation for Endorsement: No **Rationale:** Did not pass Importance to Measure and Report
If applicable, Conditions/Questions for Developer: **Developer Response:** **If applicable, Questions to the Steering Committee:**
1. Importance to Measure and Report: Y-4; N-17 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Volume alone is not an adequate quality marker. This measure should be paired with a companion outcome measure or it should be used to stratify volume but it should not be used as a stand-alone measure.
2. Scientific Acceptability of Measure Properties: *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:**
3. Usability: *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:**
4. Feasibility: *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:**

0124 Surgical volume-a. isolated coronary artery bypass graft (CABG) surgery, b. valve surgery, c. CABG+valve surgery
Public and Member Comments Numerous comments were received asking the Committee to reconsider its decision to not recommend measure 0124 for NQF endorsement. Commenters believe volume is linked to providing a higher quality of care and patient outcomes. The Committee, as well as the developer, noted that there is not a strong volume/outcome relationship for CABG and maintained its recommendation.

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1479 Patient(s) 18 years of age and older on lipid-lowering medication at admission or within seven days of discharge of an isolated CABG procedure
For More Information: Complete Measure Submission; Meeting/Call Proceedings
Description: Patient(s) 18 years of age and older hospitalized for an isolated CABG procedure taking a lipid-lowering medication at admission or within seven days of discharge. **Numerator Statement:** Patient(s) who are taking a lipid-lowering medication at CABG admission date or within seven days of discharge. **Denominator Statement:** People hospitalized for an isolated CABG procedure. **Exclusions:** 1. Exclude patients who were readmitted to an acute or non-acute care facility for any diagnosis within seven days after discharge 2. Exclude the event if the patient died during the admission 3. Exclude the event if the patient did not have pharmacy benefits throughout the CABG event. 4. Exclude the event if the patient had a contraindication for anti-lipid therapy. **Adjustment/Stratification:** no risk adjustment necessary/No stratification is required for this measure.None **Level of Analysis:** Facility/ Agency, Health Plan, Integrated Delivery System, Multi-site/ corporate chain, Can be measured at all levels, Clinicians: Individual, Group, Population: states, counties or cities, Disease Management, Program: QIO . **Type of Measure:** Process **Data Source:** Electronic administrative data/claims; pharmacy data **Measure Steward:** Ingenix | 12125 Technology Drive | Eden Prairie | Minnesota | 55344
Steering Committee Recommendation for Endorsement: Y-1; N-19; A-1 **Rationale:** The goal of the measure is laudable as it begins to view the issue of patient compliance and medication reconciliation. However, the measure, as constructed, will not achieve the goal. The actual outcome of the measure is unclear. This measure has the potential for socioeconomic bias because patients without pharmacy benefits are excluded from the measure.
If applicable, Conditions/Questions for Developer: **Developer Response:** **If applicable, Questions to the Steering Committee:**
1. Importance to Measure and Report: Y-12; N-9 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** Strong clinical evidence indicates that a lipid-lowering regime is of benefit to patients post-CABG.
2. Scientific Acceptability of Measure Properties: C-1; P-7; M-12; N-1 *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:** The Committee inquired about the percentage of patients over the age of 65 years old that were captured in this measure. The issue of attribution and accountability was discussed. It was not clear if the hospital or physicians are being held accountable if patients elect not to fill their prescriptions. This measure does not allow organizations to accurately capture data on disparities because patients without a pharmacy benefit are excluded from the measure.
3. Usability: C-3; P-6; M-9; N-3 *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or*

1479 Patient(s) 18 years of age and older on lipid-lowering medication at admission or within seven days of discharge of an isolated CABG procedure
additive value to existing measures) **Rationale:** The developer is unsure if the measure is being publicly reported.
4. Feasibility: C-5; P-8; M-7; N-1 *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:** The developer was unable to provide information on costs to implement the measure. Data is abstracted using claims and chart abstraction data.
Public and Member Comments No comments were received on this measure.

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0217 Surgery patients with recommended venous thromboembolism (VTE) prophylaxis ordered
For More Information: Complete Measure Submission; Meeting/Call Proceedings
Description: Percentage of surgery patients with recommended venous thromboembolism (VTE) prophylaxis ordered during admission. **Numerator Statement:** Surgery patients with recommended VTE prophylaxis ordered during admission. **Denominator Statement:** All selected surgery patients. **Exclusions:** Patients who are less than 18 years of age. Patients with procedures performed entirely by laparoscope. Patients whose total surgery time is less than or equal to 30 minutes. Patients who stayed less than or equal to 24 hours postoperatively. Burn patients (refer to Specifications Manual, National Healthcare Quality Measures, Appendix A, Table 5.14 for ICD-9-CM codes). Patients who are on warfarin prior to admission. Patients with contraindications to both mechanical and pharmacological prophylaxis. Patients whose ICD-9-CM Prinicpal Procedure occurred prior to the date of admission **Adjustment/Stratification:** no risk adjustment necessary/No stratification except by surgery type and those are: Intracranial neurosurgery, Appendix a, Table 5.17; General surgery, Appendix A, Table 5.19; Gynecologic Surgery, Appendix A, Table 5.20; Urologic Surgery, Appendix A, Table 5.21; Elective total hip, Appendix A, Table 5.22; Elective total knee, Appendix A, Table 5.23; Hip fracture surgery, Appendix A, Table 5.24 **Level of Analysis:** Facility/Agency; Population: national; Program: QIO; can be measured at all levels **Type of Measure:** Process **Data Source:** Electronic health/medical record; paper medical record/flow-sheet. Vendor tools or CART. CART is available for download free at http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=1138900279093 **Measure Steward:** Centers for Medicare & Medicaid Services | 7500 Security Boulevard | Baltimore | Maryland | 21244
Steering Committee Recommendation for Endorsement: Did not pass Importance to Measure and Report. The Committee determined that the measure is unnecessary in light of Measure 0218 that addresses VTE prophylaxis administration
If applicable, Conditions/Questions for Developer: **Developer Response:** **If applicable, Questions to the Steering Committee:**
1. Importance to Measure and Report: Y-2; N-17 *(1a. Impact; 1b. Performance gap; 1c. Outcome or Evidence)* **Rationale:** The Committee determined this measure was not necessary since measure 0218 is more proximal to the outcome.
2. Scientific Acceptability of Measure Properties: *(2a. Precise specifications; 2b. Reliability testing; 2c. Validity testing; 2d. Exclusions justified; 2e. Risk adjustment/stratification; 2f. Meaningful differences; 2g. Comparability; 2h. Disparities)* **Rationale:**

0217 Surgery patients with recommended venous thromboembolism (VTE) prophylaxis ordered
3. Usability: *(3a. Meaningful/useful for public reporting and quality improvement; 3b. Harmonized; 3c. Distinctive or additive value to existing measures)* **Rationale:**
4. Feasibility: *(4a. Clinical data generated during care process; 4b. Electronic sources; 4c. Exclusions – no additional data source; 4d. Susceptibility to inaccuracies/ unintended consequences identified 4e. Data collection strategy can be implemented)* **Rationale:**
Public and Member Comments No comments were received on this measure.

NOTES

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2. Cullen KA, Hall MJ, Golosinskiy A. Ambulatory surgery in the United States, 2006. *Natl Health Stat Report*, 2009;11:1-28. Available at www.cdc.gov/nchs/data/nhsr/nhsr011.pdf. Last accessed June 2011.
3. DeFrances, Lucas, and Buie.
4. DeFrances, Lucas, and Buie.
5. Cullen, Hall, and Golosinskiy.
6. DeFrances, Lucas and Buie.
7. National Quality Forum (NQF), *National Priorities Partnership*, Washington, DC: National Quality Forum. Available at www.nationalprioritiespartnership.org. Last accessed October 2010.
8. NQF, *National Voluntary Consensus Standards for Cardiac Surgery*, Washington, DC: National Quality Forum; 2004. Available at http://qualityforum.org/Projects/c-d/Cardiac_Surgery/Cardiac_Surgery.aspx . Last accessed May 2011.
9. NQF, *National Voluntary Consensus Standards for Hospital Care: Specialty Clinician Performance Measures*, Washington, DC: National Quality Forum; 2007. Available at http://www.qualityforum.org/Projects/h/Hospital_Care_Specialty_Clinician_Measures/Hospital_Care__Specialty_Clinician_Measures.aspx. Last accessed May 2011.

10. NQF, *National Voluntary Consensus Standards for Hospital Care 2007: Performance Measures*, Washington, DC: National Quality Forum; 2007. Available at http://www.qualityforum.org/Projects/h/Hospital_Care_2007_Additional_Measures/Hospital_Care_Measures.aspx. Last accessed May 2011.
11. NQF, *Measure Evaluation Criteria*, Washington, DC: National Quality Forum; 2009. Available at http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=43763. Last accessed May 2011.
12. Reserve status is defined as highly credible, reliable and valid measures that have high levels of performance with little opportunity for improvement. These measures meet all of the NQF criteria except for one subcriteria, opportunity for improvement. Performance can be monitored in the future if necessary to ensure that performance does not decline.

APPENDIX A – SPECIFICATIONS FOR THE NATIONAL VOLUNTARY CONSENSUS STANDARDS: SURGERY ENDORSEMENT MAINTENANCE 2010, PHASE I

The following tables present the detailed measure specifications for the recommended consensus standards. All information presented here has been derived directly from the measure developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of ~~May 24~~July 28, 2011. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed.

	0114 Risk-adjusted post-operative renal failure
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG (without pre-existing renal failure) who develop post-operative renal failure or require dialysis
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -

	0114 Risk-adjusted post-operative renal failure
	- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG (without pre-existing renal failure)who develop post-operative renal failure or require dialysis
Numerator Details	**Time Window:** During the hospitalization for surgery, which includes the entire postoperative period up to discharge, even if over 30 days. Definition of renal failure/dialysis requirement – Patients with acute renal failure or worsening renal function resulting in one or both of the following: - Increase of serum creatinine to 4.0 or higher, or 3x the most recent preoperative creatinine level - New requirement for dialysis postoperatively Number of isolated CABG procedures in which post-operative renal failure [CRenFail (STS Adult Cardiac Surgery Database Version 2.73] is marked as "yes"
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures including re-operations Isolated CABG is determined as a procedure for which all of the following apply: - OpCAB is marked “Yes” - VADProc is marked “No” or “Missing”) or (VADProc is marked “Yes, Implanted” and UnplVAD is marked “yes”) - OCarASDTy is marked “PFO” or “missing” - OCarAFibAProc is marked “primarily epicardial” or “missing” and - OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked “no” or “missing”
Exclusions	Patients with documented history of renal failure, baseline serum creatinine of 4.0 or higher; prior renal transplants are not considered pre-operative renal failure unless since transplantation their Cr has been or is 4.0 or higher
Exclusion Details	(Dialysis) is marked yes; Last Creatinine Level (CreatLst) is 4.0 or higher
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model.pdf
Stratification	N/A
Type Score	Rate/proportion better quality = lower score
Algorithm	N/A

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	0115 Risk-adjusted surgical re-exploration

	0115 Risk-adjusted surgical re-exploration
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who require a return to the operating room for bleeding with or without tamponade, graft occlusion, valve dysfunction, or other cardiac reason
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG who require return to the operating room for mediastinal bleeding with or without tamponade, graft occlusion, valve dysfunction, or other cardiac reason
Numerator Details	**Time Window:** During the hospitalization for surgery, which includes the entire postoperative period up to discharge, even if over 30 days Number of isolated CABG procedures in which any of the following are marked "yes": ReOp for Bleeding [COpReBld (STS Adult Cardiac Surgery Database Version 2.73)], Reintervention for Graft Occlusion (COpReGft), ReOp for Valve Dysfunction (COpReVlv), ReOp for Other Cardiac Reason (COpReOth)
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures Isolated CABG is determined as a procedure for which all of the following apply: - OpCAB is marked “Yes” - (VADProc is marked “No” or “Missing”) or (VADProc is marked “Yes, Implanted” and UnplVAD is marked “yes”) - OCarASDTy is marked “PFO” or “missing” - OCarAFibAProc is marked “primarily epicardial” or “missing” and - OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked “no” or “missing”
Exclusions	N/A
Exclusion Details	N/A
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634267294901293682.pdf
Stratification	N/A
Type Score	Rate/proportion better quality = lower score

	0115 Risk-adjusted surgical re-exploration
Algorithm	N/A

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	0129 Risk-adjusted prolonged intubation (ventilation)
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who require intubation for more than 24 hours
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG who require intubation > 24 hours
Numerator Details	**Time Window:** Number of isolated CABG procedures in which Complications-Pulmonary_Vent Prolonged (CPVntLng) is marked "yes"
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures Isolated CABG is determined as a procedure for which all of the following apply: -OpCAB is marked “Yes” -(VADProc is marked “No” or “Missing”) or (VADProc is marked “Yes, Implanted” and UnplVAD is marked “yes”) -OCarASDTy is marked “PFO” or “missing” -OCarAFibAProc is marked “primarily epicardial” or “missing” and -OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked “no” or “missing”
Exclusions	n/a
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634267353926995758.pdf
Stratification	
Type Score	Rate/proportion better quality = lower score
Algorithm	

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	0131 Risk-adjusted stroke/cerebrovascular accident

	0131 Risk-adjusted stroke/cerebrovascular accident
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who have a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that did not resolve within 24 hours
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG who have a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that did not resolve within 24 hours
Numerator Details	**Time Window:** During the hospitalization for surgery, which includes the entire postoperative period up to discharge, even if over 30 days. Number of isolated CABG procedures in which postoperative stroke [CNStrokP (STS Adult Cardiac Surgery Database Version 2.73)] is marked "yes"
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures Isolated CABG is determined as a procedure for which all of the following apply: -OpCAB is marked “Yes” -(VADProc is marked “No” or “Missing”) or (VADProc is marked “Yes, Implanted” and UnplVAD is marked “yes”) -OCarASDTy is marked “PFO” or “missing” -OCarAFibAProc is marked “primarily epicardial” or “missing” and -OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked “no” or “missing”
Exclusions	
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634267362265581794.pdf
Stratification	N/A
Type Score	Rate/proportion better quality = lower score
Algorithm	N/A

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	0119 Risk-adjusted operative mortality for CABG

	0119 Risk-adjusted operative mortality for CABG
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who die, including both 1) all deaths occurring during the hospitalization in which the CABG was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of isolated CABG procedures with an operative mortality; Number of isolated CABG procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures Isolated CABG is determined as a procedure for which all of the following apply: -OpCAB is marked "Yes" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	N/A
Exclusion Details	N/A
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634267308759980238.pdf
Stratification	N/A
Type Score	Rate/proportion better quality = lower score

	0119 Risk-adjusted operative mortality for CABG
Algorithm	N/A

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	0120 Risk-adjusted operative mortality for aortic valve replacement (AVR)
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing Aortic Valve Replacement (AVR)who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-January 2011)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf - an updated version will be made available on the STS Website in mid-January 2011
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing AVR who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of isolated AVR procedures with an operative mortality; Number of isolated AVR procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)
Denominator Statement	All patients aged 18 years and older undergoing isolated AVR surgery
Denominator Categories	Female; Male 18 yrs and older
Denominator Details	**Time Window:** 60 months Number of isolated AVR procedures; Isolated AVR is determined as a procedure for which all of the following apply: -OpValve is marked "Yes" -VSAV is marked "Yes" -VSAVPr is marked "Replacement" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpCAB , ResectSubA , VSMV, VSMVPr , OpTricus, OpPulmOpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	
Exclusion Details	

	0120 Risk-adjusted operative mortality for aortic valve replacement (AVR)
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634282025771376018.pdf
Stratification	
Type Score	Rate/proportion better quality = lower score
Algorithm	

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	0121 Risk-adjusted operative mortality for mitral valve (MV) replacement
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing MV Replacement who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing MV Replacement who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of isolated MV Replacement procedures with an operative mortality; Number of isolated MV Replacement procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)
Denominator Statement	All patients aged 18 years and older undergoing isolated MV Replacement surgery
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 60 months Number of isolated MV Replacement procedures; Isolated MV Replacement is determined as a procedure for which all of the following apply: -OpValve is marked "Yes" -VSMV is marked "Yes" -VSMVPr is marked "Replacement" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpCAB, VSAV, VSAVPr, ResectSubA, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD,

	0121 Risk-adjusted operative mortality for mitral valve (MV) replacement
	OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked “no” or “missing”
Exclusions	N/A
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634267316854669390.pdf
Stratification	N/A
Type Score	Rate/proportion better quality = lower score
Algorithm	N/A

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	0122 Risk-adjusted operative mortality MV replacement + CABG surgery
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing combined MV Replacement and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-January 2011)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-January 2011
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing combined MV Replacement and CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of MV Replacement + CABG procedures with an operative mortality; Number of MV Replacement + CABG procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked “yes.” Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)
Denominator Statement	All patients aged 18 years and older undergoing combined MV Replacement + CABG
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 60 months Number of MV Replacement + CABG procedures; MV Replacement + CABG is determined as a procedure for which all of the following apply: -OpCAB is marked as “Yes”

	0122 Risk-adjusted operative mortality MV replacement + CABG surgery
	-OpValve is marked "Yes" -VSMV is marked "Yes" -VSMVPr is marked "Replacement" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -VSAV, VSAVPr, ResectSubA, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634281986749363998.pdf
Stratification	
Type Score	Rate/proportion better quality = lower score
Algorithm	

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	0123 Risk-adjusted operative mortality for aortic valve replacement (AVR) + CABG surgery
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing combined AVR and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-January 2011)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-January 2011
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing combined AVR and CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure.
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of AVR + CABG procedures with an operative mortality; Number of AVR + CABG procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)

	0123 Risk-adjusted operative mortality for aortic valve replacement (AVR) + CABG surgery
Denominator Statement	All patients aged 18 years and older undergoing combined AVR + CABG
Denominator Categories	Female; Male 18 yrs and older
Denominator Details	**Time Window:** 60 months Number of AVR + CABG procedures; AVR + CABG is determined as a procedure for which all of the following apply: -OpCAB is marked "Yes" -OpValve is marked "Yes" -VSAV is marked "Yes" -VSAVPr is marked "Replacement" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634282035059769330.pdf
Stratification	
Type Score	Rate/proportion better quality = lower score
Algorithm	

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	1501 Risk-adjusted operative mortality for mitral valve (MV) repair
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing MV Repair who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure. (This measure applies to the procedure of MV repair, regardless of approach)
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator	Number of patients undergoing MV Repair who die, including both 1) all deaths occurring during

	1501 Risk-adjusted operative mortality for mitral valve (MV) repair
Statement	the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of isolated MV Repair procedures with an operative mortality; Number of isolated MV Repair procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)
Denominator Statement	All patients aged 18 years and older undergoing isolated MV Repair surgery (This measure applies to the procedure of MV repair, regardless of approach)
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** 60 months Number of isolated MV Repair procedures; Isolated MV Repair is determined as a procedure for which all of the following apply: -OpValve is marked "Yes" -VSMV is marked "Yes" -VSMVPr is marked "Repair" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpCAB, VSAV, VSAVPr, ResectSubA, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc , OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	N/A
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634267381711241302.pdf
Stratification	N/A
Type Score	Rate/proportion better quality = lower score
Algorithm	N/A

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	1502 Risk-adjusted operative mortality for MV repair + CABG surgery
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing combined MV Repair and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-January 2011)-- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -

	1502 Risk-adjusted operative mortality for MV repair + CABG surgery
	- an updated version will be made available on the STS Website in mid-January 2011
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing combined MV Repair and CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure
Numerator Details	**Time Window:** During hospitalization regardless of length of stay or within 30 days of surgery if discharged Number of MV Repair + CABG procedures with an operative mortality; Number of MV Repair + CABG procedures in which Mortality [Mortalty (STS Adult Cardiac Surgery Database Version 2.73)] and Mortality Operative Death (MtOpD) are marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat)
Denominator Statement	All patients aged 18 years and older undergoing combined MV Repair + CABG
Denominator Categories	Female; Male 18 yrs and older
Denominator Details	**Time Window:** 60 months Number of MV Repair + CABG procedures; MV Repair + CABG is determined as a procedure for which all of the following apply: -OpCAB is marked as "Yes" -OpValve is marked "Yes" -VSMV is marked "Yes" -VSMVPr is marked "Repair" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "Yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -VSAV, VSAVPr, ResectSubA, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634282068151467310.pdf
Stratification	
Type Score	Rate/proportion better quality = lower score
Algorithm	

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	0360 Esophageal resection mortality rate (IQI 8)
Steward	Agency for Healthcare Research and Quality | 540 Gaither Road | Rockville | Maryland | 20850
Description	Number of inpatient deaths per 100 discharges with a procedure for esophageal resection
Type	Outcome
Data Source	Electronic administrative data/claims URL http://www.qualityindicators.ahrq.gov/software.htm URL

	0360 Esophageal resection mortality rate (IQI 8)
	http://www.qualityindicators.ahrq.gov/downloads/winqi/AHRQ_QI_Windows_Software_Documentation_V41a.pdf
Level	Facility/Agency
Setting	Hospital
Numerator Statement	Number of deaths among cases meeting the inclusion and exclusion rules for the denominator.
Numerator Details	**Time Window:** Inpatient admission Discharge disposition of death (DISP=20)
Denominator Statement	Discharges, age 18 years and older, with ICD-9-CM esophageal resection procedure code and a diagnosis code of esophageal cancer in any field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes.
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** User defined; usually a calendar year ICD-9-CM esophageal resection procedure codes: 424 ESOPHAGECTOMY 4240 ESOPHAGECTOMY NOS 4241 PARTIAL ESOPHAGECTOMY 4242 TOTAL ESOPHAGECTOMY 425 THORAC ESOPHAG ANAST 4251 THORAC ESOPHAGOESOPHAGOS 4252 THORAC ESOPHAGOGASTROST 4253 THORAC SM BOWEL INTERPOS 4254 THORAC ESOPHAGOENTER NEC 4255 THORAC LG BOWEL INTERPOS 4256 THORAC ESOPHAGOCOLOS NEC 4258 THORAC INTERPOSITION NEC 4259 THORAC ESOPHAG ANAST NEC 426 STERN ESOPHAG ANAST 4261 STERN ESOPHAGOESOPHAGOST 4262 STERN ESOPHAGOGASTROSTOM 4263 STERN SM BOWEL INTERPOS 4264 STERN ESOPHAGOENTER NEC 4265 STERN LG BOWEL INTERPOS 4266 STERN ESOPHAGOCOLOS NEC 4268 STERN INTERPOSITION NEC 4269 STERN ESOPHAG ANAST NEC ONLY if selected diagnosis codes: esophageal cancer (see below) gastrointestinal-related cancer (see below) OR: ICD-9-CM gastrectomy procedure code: 4399 OTHER TOTAL GASTRECTOMY - ONLY if selected diagnosis codes: esophageal cancer (see below) Esophageal cancer: 1500 MALIGNANT NEOPLASM OF ESOPHAGUS, CERVICAL 1501 MALIGNANT NEOPLASM OF ESOPHAGUS, THORACIC 1502 MALIGNANT NEOPLASM OF ESOPHAGUS, ABDOMINAL 1503 MALIGNANT NEOPLASM OF ESOPHAGUS, UPPER THIRD OF 1504 MALIGNANT NEOPLASM OF ESOPHAGUS, MIDDLE THIRD OF 1505 MALIGNANT NEOPLASM OF ESOPHAGUS, LOWER THIRD OF

	0360 Esophageal resection mortality rate (IQI 8)
	1508 MALIGNANT NEOPLASM OF ESOPHAGUS, OTHER SPECIFIED PART 1509 MALIGNANT NEOPLASM OF ESOPHAGUS, UNSPECIFIED Gastrointestinal cancer 1510 MALIGNANT NEOPLASM OF STOMACH, CARDIA 1978 SECONDARY MALIGNANT NEOPLASM OF RESPIRATORY AND DIGESTIVE SYSTEMS, OTHER DIGESTIVE ORGANS AND SPLEEN 2301 CARCINOMA IN SITU OF DIGESTIVE ORGANS, ESOPHAGUS 2355 NEOPLASM OF UNCERTAIN BEHAVIOR OF DIGESTIVE AND RESPIRATORY SYSTEMS, OTHER AND UNSPECIFIED DIGESTIVE ORGANS
Exclusions	Exclude discharges with pregnancy, discharge to a short term hospital or missing information for discharge disposition, age or sex.
Exclusion Details	Exclude cases: • missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1 =missing) • transferring to another short-term hospital (DISP=2) • MDC 14 (pregnancy, childbirth, and puerperium)
Risk Adjustment	case-mix adjustment The predicted value for each case is computed using GEE logistic regression and covariates for age (in 5-year age groups), APR-DRG and MDC. The reference population used in the regression is the universe of discharges for states that participate in the HCUP State Inpatient Databases (SID) for the year 2007, a database consisting of approximately 35 million discharges from 43 states. The expected rate is computed as the sum of the predicted value for each case divided by the number of cases for the unit of analysis of interest (i.e., county or state). The risk adjusted rate is computed using indirect standardization as the observed rate divided by the expected rate, multiplied by the reference population rate. The Smoothed Rate is the risk-adjusted rate shrunken to the volume-specific rate and the prior year smoothed rate. age 18-24; age 25-29; age 30-34; age 35-39; age 40-44; age 45-49; age 50-54; age 55-59; age 60-64 (omitted); age 65-69; age 70-74; age 75-79; age 80-84; age 85+ each age category*female APRDRG 2201-MAJOR STOMACH, ESOPHAGEAL & DUODENAL PROCEDURES (MINOR) APRDRG 2202-MAJOR STOMACH, ESOPHAGEAL & DUODENAL PROCEDURES (MODERATE) ADRG 2203-MAJOR STOMACH, ESOPHAGEAL & DUODENAL PROCEDURES (MAJOR) APRDRG 2204-MAJOR STOMACH, ESOPHAGEAL & DUODENAL PROCEDURES (EXTREME) ADRG 9999 (OTHER) URL http://www.qualityindicators.ahrq.gov/downloads/iqi/IQI%20Risk%20Adjustment%20Tables%20(Version%204%202)%20wo%20APR-DRG.pdf
Stratification	Observed rates may be stratified by age group, race/ethnicity categories, payer categories and sex.
Type Score	Rate/proportion better quality = lower score
Algorithm	Each Inpatient Quality Indicator (IQI) expressed as a rate, is defined as outcome of interest/population at risk or numerator/denominator. The Quality Indicators software performs five steps to produce the IQI rates. 1) Discharge-level data is used to mark inpatient records containing outcomes of interest. 2) Identify populations at risk. For provider IQIs populations at risk are derived from hospital discharge records. 3) Calculate observed rates. Using output data from steps 1 and 2, IQI rates are calculated for user-specified combinations of stratifiers. 4) Risk adjust the IQI rates. Regression coefficients from a reference population database are applied to the observed rates in the risk-adjustment process. The risk-adjusted rates will then reflect the age and APR-DRG distribution of data in the reference population. 5) Create multivariate signal extraction (MSX) smoothed rates. Shrinkage factors are applied to the risk-adjusted rates for each IQI in the MSX process. For each IQI, the shrinkage estimate reflects a reliability

	0360 Esophageal resection mortality rate (IQI 8)
	adjustment unique to each indicator. Full information on IQI algorithms and specification can be found at http://qualityindicators.ahrq.gov/iqi_download.htm.

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	0361 Esophageal resection volume (IQI 1)
Steward	Agency for Healthcare Research and Quality | 540 Gaither Road | Rockville | Maryland | 20850
Description	Number of discharges with a procedure for esophogeal resection
Type	Structure/management
Data Source	Electronic administrative data/claims URL http://www.qualityindicators.ahrq.gov/software.htm URL http://www.qualityindicators.ahrq.gov/downloads/winqi/AHRQ_QI_Windows_Software_Documentation_V41a.pdf
Level	Facility/Agency
Setting	Hospital
Numerator Statement	Discharges, age 18 years and older, with ICD-9-CM code for esophageal resection in any procedure field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes.
Numerator Details	**Time Window:** Time period is user defined. Users of the measure typically use a 12 month time period. CD-9-CM esophageal resection procedure codes: 424 ESOPHAGECTOMY 4240 ESOPHAGECTOMY NOS 4241 PARTIAL ESOPHAGECTOMY 4242 TOTAL ESOPHAGECTOMY 425 THORAC ESOPHAG ANAST 4251 THORAC ESOPHAGOESOPHAGOS 4252 THORAC ESOPHAGOGASTROST 4253 THORAC SM BOWEL INTERPOS 4254 THORAC ESOPHAGOENTER NEC 4255 THORAC LG BOWEL INTERPOS 4256 THORAC ESOPHAGOCOLOS NEC 4258 THORAC INTERPOSITION NEC 4259 THORAC ESOPHAG ANAST NEC 426 STERN ESOPHAG ANAST 4261 STERN ESOPHAGOESOPHAGOST 4262 STERN ESOPHAGOGASTROSTOM 4263 STERN SM BOWEL INTERPOS 4264 STERN ESOPHAGOENTER NEC 4265 STERN LG BOWEL INTERPOS 4266 STERN ESOPHAGOCOLOS NEC 4268 STERN INTERPOSITION NEC 4269 STERN ESOPHAG ANAST NEC OR ICD-9-CM gastrectomy procedure code: 4399 OTHER TOTAL GASTRECTOMY ONLY if accompanied by selected diagnosis codes 1500 MALIGNANT NEOPLASM OF ESOPHAGUS, CERVICAL 1501 MALIGNANT NEOPLASM OF ESOPHAGUS, THORACIC 1502 MALIGNANT NEOPLASM OF ESOPHAGUS, ABDOMINAL 1503 MALIGNANT NEOPLASM OF ESOPHAGUS, UPPER THIRD OF 1504 MALIGNANT NEOPLASM OF ESOPHAGUS, MIDDLE THIRD OF

	0361 Esophageal resection volume (IQI 1)
	1505 MALIGNANT NEOPLASM OF ESOPHAGUS, LOWER THIRD OF 1508 MALIGNANT NEOPLASM OF ESOPHAGUS, OTHER SPECIFIED PART 1509 MALIGNANT NEOPLASM OF ESOPHAGUS, UNSPECIFIED Exclude cases: MDC 14 (pregnancy, childbirth, and puerperium)
Denominator Statement	Not applicable
Denominator Categories	Female; Male 18 and older
Denominator Details	**Time Window:** Not applicable Not Applicable
Exclusions	Not Applicable
Exclusion Details	Not Applicable
Risk Adjustment	no risk adjustment necessary Not applicable
Stratification	Not Applicable
Type Score	Count better quality = higher score
Algorithm	The volume is the number of discharges with a procedure for esophageal resection

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	0116 Anti-platelet medication at discharge
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on anti-platelet medication
Type	Process
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG who were discharged on anti-platelet medication
Numerator Details	**Time Window:** Number of isolated CABG procedures in which discharge aspirin [DCASA (STS Adult Cardiac Surgery Database Version 2.73)] or discharge ADP inhibitors (DCADP) is marked “yes” If a patient is on Plavix due to an aspirin contraindication, s/he is counted in the numerator because STS accepts either ASA or ADP inhibitors for the numerator
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 and older

	0116 Anti-platelet medication at discharge
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures excluding cases with in-hospital mortality or cases for which discharge aspirin use was contraindicated. Isolated CABG is determined as a procedure for which all of the following apply: -OpCAB is marked "Yes" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	Cases are removed from the denominator if there was an in-hospital mortality or if discharge aspirin was contraindicated. In other words, if discharge aspirin is marked contraindicated or there is an in-hospital mortality, the patient is excluded from the denominator, and therefore, the measure is calculated without those patients.
Exclusion Details	Mortality Discharge Status (MtDCStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; discharge aspirin (DCASA) is marked as "Contraindicated"
Risk Adjustment	no risk adjustment necessary
Stratification	N/A
Type Score	Rate/proportion better quality = higher score
Algorithm	N/A

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	0118 Anti-lipid treatment discharge
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on a statin or other lipid-lowering regimen
Type	Process
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-January 2011 --- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-January 2011
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients undergoing isolated CABG who were discharged on a statin or other lipid-lowering regimen
Numerator Details	**Time Window:** Number of isolated CABG procedures in which discharge lipid lowering medication [DCLipid (STS Adult Cardiac Surgery Database Version 2.73)] is marked "yes"
Denominator Statement	All patients undergoing isolated CABG
Denominator	Female; Male 18 yrs and older

	0118 Anti-lipid treatment discharge
Categories	
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures excluding cases with in-hospital mortality or cases for which discharge anti-lipid treatment use was contraindicated. Isolated CABG is determined as a procedure for which all of the following apply: -OpCAB is marked "Yes" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	Cases are removed from the denominator if there was an in-hospital mortality or if discharge anti-lipid treatment was contraindicated.
Exclusion Details	Mortality Discharge Status (MtDCStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; DCLipid is marked as "Contraindicated"
Risk Adjustment	no risk adjustment necessary
Stratification	
Type Score	Rate/proportion better quality = higher score
Algorithm	

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	0130 Risk-adjusted deep sternal wound infection rate
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Percent of patients aged 18 years and older undergoing isolated CABG who, within 30 days postoperatively, develop deep sternal wound infection involving muscle, bone, and/or mediastinum requiring operative intervention
Type	Outcome
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-January 2011)--- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-January 2011
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Number of patients who, within 30 days postoperatively, develop deep sternal wound infection involving muscle, bone, and/or mediastinum requiring operative intervention. Must have all of the following conditions: -Wound opened with excision of tissue (I&D) or re-exploration of mediastinum -Positive culture unless patient on antibiotics at time of culture or no culture obtained -Treatment with antibiotics beyond perioperative prophylaxis
Numerator Details	**Time Window:** Within 30 days postoperatively Number of isolated CABG procedures in which postoperative deep sternal wound infection [CIStDeep (STS Adult Cardiac Surgery Database Version 2.73)] is marked "yes"

	0130 Risk-adjusted deep sternal wound infection rate
Denominator Statement	All patients undergoing isolated CABG
Denominator Categories	Female; Male 18 yrs and older
Denominator Details	**Time Window:** 12 months Number of isolated CABG procedures; Isolated CABG is determined as a procedure for which all of the following apply: -OpCAB is marked "Yes" -(VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") -OCarASDTy is marked "PFO" or "missing" -OCarAFibAProc is marked "primarily epicardial" or "missing" and -OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"
Exclusions	
Exclusion Details	
Risk Adjustment	case-mix adjustment Please see attachment Attachment 2a.15 Detailed Risk Model-634282057229855466.pdf
Stratification	
Type Score	Rate/proportion better quality = lower score
Algorithm	

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	0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time
Steward	Centers for Medicare & Medicaid Services | 7500 Security Boulevard , Mail Stop S3-01-02 | Baltimore | Maryland | 21244-1850
Description	Percentage of surgery patients who received appropriate Venous Thromboembolism (VTE) Prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time
Type	Process
Data Source	Electronic Clinical Data, Electronic Health/Medical Record, Paper medical record/flow-sheet URL http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=1138900279093 URL http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228754600169
Level	Can be measured at all levels, Facility/Agency, Program : QIO
Setting	Hospital
Numerator Statement	Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to Surgical Incision Time to 24 hours after Surgery End Time Appropriate prophylaxis according to Surgery Type: Intracranial Neurosurgery Any of the following: •Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS) •Low-dose unfractionated heparin (LDUH) Low molecular weight heparin (LMWH)2

	0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time
	•LDUH or LMWH2 combined with IPC or GCS General Surgery Any of the following: •Low-dose unfractionated heparin (LDUH) •Low molecular weight heparin (LMWH) •Factor Xa Inhibitor (Fondaparinux) •LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS General Surgery with a reason for not administering pharmacological prophylaxisAny of the following: •Graduated Compression stockings (GCS) •Intermittent pneumatic compression devices (IPC) Gynecologic Surgery Any of the following: •Low-dose unfractionated heparin (LDUH) •Low molecular weight heparin (LMWH) •Factor Xa Inhibitor (fondaparinux) •Intermittent pneumatic compression devices (IPC) •LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS Urologic Surgery Any of the following: •Low-dose unfractionated heparin (LDUH) •Low molecular weight heparin (LMWH) •Factor Xa Inhibitor (fondaparinux) •Intermittent pneumatic compression devices (IPC) •Graduated compression stockings (GCS) •LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS Elective Total Hip Replacement Any of the following started within 24 hours of surgery: •Low molecular weight heparin (LMWH) •Factor Xa Inhibitor (Fondaparinux) •Warfarin Elective Total Knee Replacement Any of the following: •Low molecular weight heparin (LMWH) •Factor Xa Inhibitor (Fondaparinux) •Warfarin •Intermittent pneumatic compression devices (IPC) •Venous foot pump (VFP) Hip Fracture Surgery Any of the following: •Low-dose unfractionated heparin (LDUH) •Low molecular weight heparin (LMWH) •Factor Xa Inhibitor (Fondaparinux) •Warfarin Elective Total Hip Replacement with a reason for not administering pharmacological prophylaxis Any of the following: •Intermittent pneumatic compression devices (IPC) •Venous foot pump (VFP) Hip Fracture Surgery with a reason for not administering pharmacological prophylaxis Any of the following: •Graduated Compression Stockings (GCS) •Intermittent pneumatic compression devices (IPC)

	0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time
	•Venous foot pump (VFP)
Numerator Details	**Time Window:** 24 hours prior to incision to 24 hours after surgery end time Data Elements: Anesthesia Type VTE Prophylaxis VTE Timely
Denominator Statement	All selected surgery patients
Denominator Categories	Female; Male Patients 18 years of age and older
Denominator Details	**Time Window:** Entire inpatient admission Data Elements: Admission Date Anesthesia End Date Anesthesia End Time Anesthesia Start Date Anesthesia Start Time Birthdate Clinical Trial Discharge Date ICD-9-CM Principal Diagnosis Code ICD-9-CM Principal Procedure Code Laparoscope Perioperative Death Preadmission Warfarin Reason for Not Administering VTE Prophylaxis
Exclusions	Data Elements Clinical Trial Laparoscope Perioperative Death Preadmission Warfarin Reason for Not Administering VTE Prophylaxis
Exclusion Details	Excluded Populations: Patients less than 18 years of age Patients who have a Length of Stay greater than 120 days Burn patients (as defined in Appendix A, Table 5.14 for ICD-9-CM codes) Patients with procedures performed entirely by Laparoscope Patients enrolled in clinical trials Patients who are on warfarin prior to admission Patients whose ICD-9-CM principal procedure occurred prior to the date of admission Patients whose total surgery time is less than or equal to 60 minutes Patients with hospital length of stay less than or equal to 3 calendar days Patients who expire perioperatively Patients with reasons for not administering both mechanical and pharmacological prophylaxis Patients who did not receive VTE Prophylaxis (as defined in the Data Dictionary)
Risk Adjustment	no risk adjustment necessary N/A
Stratification	No stratification except by surgery type and those are Intracranial Neurosurgery Appendix A,Table 5.17 General Surgery Appendix A, Table 5.19

	0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time
	Gynecologic Surgery Appendix A, Table 5.20 Urologic Surgery Appendix A,Table 5.21 Elective Total Hip Replacement Appendix A,Table 5.22 Elective Total Knee Replacement Appendix A,Table 5.23 Hip Fracture Surgery Appendix A,Table 5.24
Type Score	Rate/proportion better quality = higher score
Algorithm	SCIP- Venous Thromboembolism (VTE)-2: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery Numerator: Surgery patients who received Venous Thromboembolism (VTE) prophylaxis 24 hours prior to Anesthesia Start Time to 24 hours after Anesthesia End Time. Denominator: All selected surgery patients. Variable Key: Patient Age, Length of Stay (LOS), Surgery Length, Surgery Days 1.Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure. 2.Calculate Patient Age. The Patient Age, in years, is equal to the Admission Date minus the Birthdate. Use the month and day portion of admission date and birthdate to yield the most accurate age. 3.Check Patient Age a.If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. b.If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code. 4.Check ICD-9-CM Principal Procedure Code a.If the ICD-9-CM Principal Procedure Code is not on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and proceed to ICD-9-CM Principal Diagnosis Code. 5.Check ICD-9-CM Principal Diagnosis Code a.If the ICD-9-CM Principal Diagnosis Code is on Table 5.14, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Diagnosis Code is not on Table 5.14, continue processing and proceed to the LOS calculation. 6.Calculate LOS. LOS, in days, is equal to the Discharge Date minus the Admission Date. 7.Check LOS a.If the LOS is less than or equal to 3 days, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Calculation. Stop processing. b.If the LOS is greater than 3 days, continue processing and proceed to Laparoscope. 8.Check Laparoscope a.If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Laparoscope equals 1 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Laparoscope equals 2, continue processing and proceed to Clinical Trial. 9.Check Clinical Trial a.If Clinical Trial is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Clinical Trial equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Clinical Trial equals No, continue processing and proceed to Preadmission Warfarin. 10.Check Preadmission Warfarin

	0218 Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time
	a.If Preadmission Warfarin is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Preadmission Warfarin equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Preadmission Warfarin equals No, continue processing and proceed to Anesthesia Start Date. 11.Check Anesthesia Start Date a.If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-13 b.If the Anesthesia Start Date equals Unable To Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation. 12.Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date. 13.Check Surgery Days a.If the Surgery Days is less than zero, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. b.If the Surgery Days is greater than or equal to zero, continue processing and proceed to Perioperative Death. 14.Check Perioperative Death a.If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Perioperative Death equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Perioperative Death equals No, continue processing and proceed to Anesthesia Start Time. 15.Check Anesthesia Start Time a.If the Anesthesia Start Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If the Anesthesia Start Time equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If the Anesthesia Start Time equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Date. 16.Check Anesthesia End Date a.If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If the Anesthesia End Date equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If the Anesthesia End Date equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Time. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-14 17.Check Anesthesia End Time a.If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If the Anesthesia End Time equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If the Anesthesia End Time equals a Non Unable to Determine Value, continue processing and proceed to the Surgery Length calculation. 18.Calculate Surgery Length. Surgery Length, in minutes, is equal to the Anesthesia End Date

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	and Anesthesia End Time minus the Anesthesia Start Date and Anesthesia Start Time. 19.Check Surgery Length a.If the Surgery Length is less than or equal to 60 minutes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. b.If the Surgery Length is greater than 60 minutes, continue processing proceed to Reason for Not Administering VTE Prophylaxis. 20.Check Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Reason for Not Administering VTE Prophylaxis equals 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Reason for Not Administering VTE Prophylaxis equals 1, 2, or 4, continue processing and proceed to VTE Prophylaxis. 21.Check VTE Prophylaxis a.If no values are populated in the VTE grid, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If VTE Prophylaxis equals A, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If the VTE grid is populated with any of values 1, 2, 3, 4, 5, 6, 7, or 8, continue processing and proceed to recheck the ICD-9-CM Principal Procedure Code. Note: If VTE Prophylaxis field is populated with an allowable value of 1, 2, 3, 4, 5, 6, 7, or 8 and the corresponding VTE Timely field is Missing, the entire case will be rejected by The Joint Commission and Centers for Medicare and Medicaid Services (CMS) warehouses. 22.Recheck ICD-9-CM Principal Procedure Code a.If the ICD-9-CM Principal Procedure Code is on Tables 5.17, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing. Proceed to step 26 and recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24. Do not recheck step 23 and step 25 VTE Prophylaxis or step 24 Reason for Not Administering VTE Prophylaxis for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 as steps 23 through 26 check for codes on Table 5.19 only. b.If the ICD-9-CM Principal Procedure Code is on Table 5.19, continue processing and recheck VTE Prophylaxis. 23.Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.19 a.If any VTE Prophylaxis equals 1, 2, or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 5, continue processing and recheck Reason for Not Administering VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 1, 2, or 5, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis. 24.Recheck Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and proceed to Anesthesia Type. 1.If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. 2.If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 3.If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis. b.If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and recheck VTE Prophylaxis. 25.Recheck VTE Prophylaxis

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	a.If any VTE Prophylaxis equals 3 or 4, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 3 or 4, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 3 and 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If none of the VTE Prophylaxis equals 3 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 26.Recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code was not on Table 5.19 a.If the ICD-9-CM Principal Procedure Code is on Table 5.17, continue processing and recheck VTE Prophylaxis. 1.If any VTE Prophylaxis equals 1, 2, or 3, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis equals 1, 2, or 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code. 27.Recheck ICD-9-CM Principal Procedure Code for Tables 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17 or 5.19 a.If the ICD-9-CM Principal Procedure Code is on Table 5.20, continue processing and recheck VTE Prophylaxis. 1.If any VTE Prophylaxis equals 1, 2, 3 or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3 and 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis equals 1, 2, 3, or 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code. 28.Recheck ICD-9-CM Principal Procedure Code for Tables 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, or 5.20 a.If the ICD-9-CM Principal Procedure Code is on Table 5.21, continue processing and recheck VTE Prophylaxis. 1.If any VTE Prophylaxis equals 1, 2, 3, 4, or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3 or 4 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3 and 4 and 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis equals 1, 2, 3, 4, or 5, the case will proceed to a Measure

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	Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-18 29.Recheck ICD-9-CM Principal Procedure Code for Tables 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20, or 5.21 a.If the ICD-9-CM Principal Procedure Code is on Table 5.22, continue processing and recheck VTE Prophylaxis. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.23 or 5.24, continue processing. Proceed to step 34 and recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24. Do not recheck steps 30, 31 and 33 VTE Prophylaxis or step 32 Reason for Not Administering VTE Prophylaxis. 30.Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.22 a.If any VTE Prophylaxis equals 2, 5, 6, or 8, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 2 or 5 or 6 or 8, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 2 and 5 and 6 and 8, continue processing and recheck VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 2, 5, 6, or 8, continue processing and proceed to recheck VTE Prophylaxis. 31.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 1, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 1, continue processing and check ICD-9-CM Principal or Other Diagnosis Codes. i.If any of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If none of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, continue processing and recheck Reason for Not Administering VTE Prophylaxis. 2.If VTE Timely equals No for VTE Prophylaxis of 1, continue processing and recheck Reason for Not Administering VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 1, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-19 32.Recheck Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type. 1.If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. 2.If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 3.If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis. b.If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis. 33.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 3 or 7, continue processing and check VTE Timely. Note: When

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	evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 3 or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 3 and 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If none of the VTE Prophylaxis equals 3 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 34.Recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20, 5.21, or 5.22 a.If the ICD-9-CM Principal Procedure Code is on Table 5.23, continue processing and recheck VTE Prophylaxis. 1.If Any VTE Prophylaxis is equal to 2, 3, 5, 6, 7, or 8, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 2 or 3 or 5 or 6 or 7 or 8, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 2 and 3 and 5 and 6 and 7 or 8, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis is equal to 2, 3, 5, 6, 7, or 8, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Table 5.24, continue processing and recheck VTE Prophylaxis. 35.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 1, 2, 5, 6, or 8, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 5 or 6 or 8, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 5 and 6 and 8, continue processing and recheck Reason for Not Administering VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 1, 2, 5, 6, or 8, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis. 36.Recheck Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type. 1.If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. 2.If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 3.If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis. b.If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis. 37.Recheck VTE Prophylaxis a.If none of the VTE Prophylaxis equals 3, 4, or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If any VTE Prophylaxis equals 3, 4, or 7, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 3 or 4 or 7, the case will proceed to a

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	Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 3 or 4 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

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	0113 Participation in a systematic database for cardiac surgery
Steward	Society of Thoracic Surgeons | 633 North Saint Clair Street, Suite 2320 | Chicago | Illinois | 60611
Description	Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data
Type	Structure/management
Data Source	Registry data URL Data Collection Form (an updated version will be made available on the STS Website in mid-December of 2010) --- http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataCollectionForm2_7_Annotated_20101021.pdf URL http://www.sts.org/documents/pdf/ndb2010/STSAdultCVDataSpecificationsV2_7_20101021.pdf -- an updated version will be made available on the STS Website in mid-December of 2010
Level	Clinicians : Group, Facility/Agency, Population : Counties or cities, Population : National, Population : Regional/network, Population : states
Setting	Hospital
Numerator Statement	Does the facility participate in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data? (y/n)
Numerator Details	**Time Window:** 12 months Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data. Participation in the STS Adult Cardiac Surgery Database, for example, is initiated by the surgeons and/or hospital and is defined as quarterly submission of 100% of cases via an approved software system to the Duke Clinical Research Institute, the data repository for the three STS Databases. STS's audit cross-checks submitted cases against hospital logs to assure all cases have been captured.
Denominator Statement	N/A
Denominator Categories	Female; Male 18 years or older on date of encounter
Denominator Details	**Time Window:**
Exclusions	
Exclusion Details	
Risk Adjustment	no risk adjustment necessary
Stratification	N/A
Type Score	Categorical passing score defines better quality
Algorithm	N/A

APPENDIX B—NATIONAL VOLUNTARY CONSENSUS STANDARDS: SURGERY ENDORSEMENT MAINTENANCE 2010 STEERING COMMITTEE AND NQF STAFF

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APPENDIX C—COMPARISON OF RELATED MEASURES

Deliberation regarding related measures is recorded in the Steering Committee "Recommendation for Endorsement: Rationale" section of the relevant measures under consideration in Phase I.

	Maintenance Measure #0113: Participation in a systematic database for cardiac surgery	**Endorsed Measure #0456:** Participation in a systematic national database for general thoracic surgery	**Endorsed Measure #0493:** Participation by a hospital, physician or other clinician in systematic clinical database registry that includes consensus endorsed quality measures
Status	Currently undergoing maintenance review	Endorsed 7/2008	Endorsed 9/2010
Steward	Society of Thoracic Surgeons	Society of Thoracic Surgeons	Centers for Medicare & Medicaid Services
Description	Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data	Participation in at least one multi-center, standardized data collection and feedback program that provides benchmarking of the physician's data relative to national and regional programs and uses process and outcome measures.	Participation in a systematic qualified clinical database registry involves: a. Hospital, physician or other clinician submits standardized data elements to registry b. Data elements are applicable to consensus endorsed quality measures c. Registry measures shall include at least two (2) representative NQF

	Maintenance Measure #0113: Participation in a systematic database for cardiac surgery	**Endorsed Measure #0456:** Participation in a systematic national database for general thoracic surgery	**Endorsed Measure #0493:** Participation by a hospital, physician or other clinician in systematic clinical database registry that includes consensus endorsed quality measures
			consensus endorsed measures for registry's clinical topic(s) and report on all patients eligible for the selected measures. d. Registry provides calculated measures results, benchmarking, and quality improvement information to individual hospitals, physicians and clinicians. e. Registry must receive data from more than 5 separate practices and may not be located (warehoused) at an individual hospital or an individual group's practice. Participation in a national or state-wide registry is encouraged for this measure. f. Registry may provide feedback directly to the hospital or provider's local registry if one exists.
Type of Measure	Structure/management	Process	Structure/management
Numerator	Does the facility participate in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data? (y/n) Time window: 12 months	Whether or not the physician participates in at least one multi-center data collection and feedback program. Time window:	The hospital or clinician participates in a systematic qualified clinical database registry capable of the following: a. hospital, physician, or other clinician submits standardized data elements to registry b. data elements are applicable to consensus endorsed quality measures c. registry measures shall include at least two (2) representative NQF consensus endorsed

	Maintenance Measure #0113: Participation in a systematic database for cardiac surgery	**Endorsed Measure #0456:** Participation in a systematic national database for general thoracic surgery	**Endorsed Measure #0493:** Participation by a hospital, physician or other clinician in systematic clinical database registry that includes consensus endorsed quality measures
			measures for registry's clinical topic(s) and report on all patients eligible for the selected measures d. registry provides calculated measures results, benchmarking, and quality improvement information to individual hospitals, physicians and clinicians e. registry must receive data from more than 5 separate hospitals or practices and may not be located (warehoused) at an individual hospital, or an individual group's practice. Participation in a national or state-wide registry is encouraged for this measure f. registry may provide feedback directly to the hospital or provider's local registry if one exists.
Numerator Details	Participation in a clinical database with broad state, regional, or national representation, that provides regular performance reports based on benchmarked data. Participation in the STS Adult Cardiac Surgery Database, for example, is initiated by the surgeons and/or hospital and is defined as quarterly submission of 100% of cases via an approved software system to the Duke Clinical Research Institute, the data repository for the three STS Databases. STS's audit		N/A

	Maintenance Measure #0113: Participation in a systematic database for cardiac surgery	**Endorsed Measure #0456:** Participation in a systematic national database for general thoracic surgery	**Endorsed Measure #0493:** Participation by a hospital, physician or other clinician in systematic clinical database registry that includes consensus endorsed quality measures
	cross-checks submitted cases against hospital logs to assure all cases have been captured.		
Denominator	N/A	N/A	1
Denominator Categories	Female, Male; 18 years or older on date of encounter	Female, Male; 18 years or older	
Denominator Details	N/A		
Exclusions	N/A	N/A	N/A
Exclusions Details	N/A		N/A
Risk Adjustment	No risk adjustment necessary	No risk adjustment necessary	No risk adjustment necessary
Stratification	N/A	N/A	N/A
Type Score	Categorical		
Algorithm	N/A		N/A
Data Source	Registry data	Lab data, paper medical record/flow-sheet	
Level of Measurement /Analysis	Clinicians: Group; Facility/agency; Population: National, regional/network, states, counties or cities	Clinicians: Individual	Clinicians: Individual
Care Settings	Hospital	Ambulatory care: Clinic	

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	Maintenance Measure #0134: Use of internal mammary artery (IMA) in coronary artery bypass graft (CABG)	**Endorsed Measure #0516:** Use of IMA in isolated CABG (surgeon level)
Status	Currently undergoing maintenance review	Endorsed 5/2007
Steward	Society of Thoracic Surgeons	Society of Thoracic Surgeons
Description	Percentage of patients aged 18 years and older undergoing isolated coronary artery bypass graft (CABG) who received an internal mammary artery (IMA) graft.	Percentage of patients aged 18 years and older undergoing isolated CABG surgery who received an Internal Mammary Artery (IMA) graft
Type of Measure	Process	Process
Numerator	Number of patients undergoing isolated coronary artery bypass graft (CABG) who received an internal mammary artery (IMA) graft. Time window:	Number of patients who receive IMA graft in isolated CABG Time window:
Numerator Details	Number of isolated CABG procedures in which IMA Artery Used [IMAArtUs (STS Adult Cardiac Surgery Database Version 2.73)] is marked "Left IMA," "Right IMA," or "Both IMAs"	Number of isolated CABG procedures in which "internal mammary arteries used as graft" [IMAArtUs (1560)- STS Adult Cardiac Surgery Database, Version 2.61, sequence number 1560] is marked as 'Left IMA', 'Right IMA', or 'Both IMAs' Please see STS Adult Cardiac Surgery Database Data Collection Form, Version 2.61: http://www.sts.org/documents/pdf/AdultCV2.61DCF_Annotated.pdf
Denominator	All patients undergoing isolated CABG. Time window: 12 months	All patients undergoing isolated CABG Time window: 12 months
Denominator Categories	Female, Male; 18 and older	Female, Male; ≥18 years on date of encounter
Denominator Details	Number of isolated CABG procedures Isolated CABG is determined as a procedure for which all of the following apply: - OpCAB is marked "Yes" - (VADProc is marked "No" or "Missing") or (VADProc is marked "Yes, Implanted" and UnplVAD is marked "yes") - OCarASDTy is marked "PFO" or "missing" - OCarAFibAProc is marked "primarily epicardial" or "missing" and	Number of isolated CABG procedures excluding repeat CABG. Isolated CABG is determined as a procedure for which OpCab (seq no 1280) is marked 'Yes' and OpValve (1290), VAD (1300), OpAortic (1630), OpMitral (1640), OpTricus (1650), OpPulm (1660), OpONCard (1320), OCarLVA (2360), OCarVSD (2370), OCarASD (2380), OCarBati (2390), OCarSVR (2400), OCarCong (2410), OCarLasr (2420), OCarTrma (2430), OCarCrTx (2440), OCarAfib (2470), ONCAoAn (2510), and OCarOthr (2560) are all marked 'No' or

	- OpValve, VSAV, VSAVPr, ResectSubA, VSMV, VSMVPr, OpTricus, OpPulm, OpONCard, OCarLVA, OCarVSD, OCarSVR, OCarCong, OCarTrma, OCarCrTx, OCAoProcType, EndoProc, OCTumor, OCPulThromDis, OCarOthr are all marked "no" or "missing"	'Missing'. Please see STS Adult Cardiac Surgery Database Data Collection Form, Version 2.61: http://www.sts.org/documents/pdf/AdultCV2.61DCF_Annotated.pdf
Exclusions	Cases are removed from the denominator if the patient had a previous CABG prior to the current admission or if IMA was not used and one of the following reasons was provided: - The IMA is not a suitable conduit due to size or flow - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease	Cases are removed from the denominator if there was a prior CABG performed.
Exclusions Details	Cases are removed from the denominator if the patient had a previous CABG prior to the current admission or if IMA was not used and one of the following reasons was provided: - The IMA is not a suitable conduit due to size or flow - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease	Repeat CABG is identified where PrCAB (600) is marked 'Yes' Please see STS Adult Cardiac Surgery Database Data Collection Form, Version 2.61: http://www.sts.org/documents/pdf/AdultCV2.61DCF_Annotated.pdf
Risk Adjustment	No risk adjustment necessary	No risk adjustment necessary
Stratification	N/A	N/A
Type Score	Rate/proportion	Rate/proportion
Algorithm	N/A	N/A
Data Source	Registry data	Electronic health/medical record, electronic clinical data, registry data, paper medical record/flow-sheet
Level of Measurement /Analysis	Clinicians: Group; Facility/agency; Population: National, regional/network, states, counties or cities	Clinician: Individual; Program: Other; All levels
Care Settings	Hospital	Hospital

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	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
Status	Currently undergoing maintenance review	Currently undergoing maintenance review	Endorsed 9/2010
Steward	Agency for Healthcare Research and Quality	Agency for Healthcare Research and Quality	Leapfrog Group
Description	Number of inpatient deaths per 100 discharges with a procedure for esophageal resection	Number of discharges with a procedure for esophageal resection.	A reliability adjusted measure of Esophagectomy surgical performance that optimally combines two important domains: Esophagectomy hospital volume and Esophagectomy operative mortality, to provide predictions on hospital Esophagectomy survival rates in patients age 18 and over.
Type of Measure	Outcome	Structure/management	Outcome
Numerator	Number of deaths among cases meeting the inclusion and exclusion rules for the denominator Time window: inpatient admission	Discharges, age 18 years and older, with ICD-9-CM code for esophageal resection in any procedure field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes. Time window: Time period is user defined. Users of the measure typically use a 12 month time period.	Outcome: Survival of esophageal cancer patients who undergo an esophagectomy Time window: during the hospital admission
Numerator Details	Discharge disposition of death (DISP=20)	CD-9-CM esophageal resection procedure codes: 424 ESOPHAGECTOMY 4240 ESOPHAGECTOMY NOS 4241 PARTIAL ESOPHAGECTOMY 4242 TOTAL ESOPHAGECTOMY 425 THORAC ESOPHAG ANAST 4251 THORAC ESOPHAGOESOPHAGOS 4252 THORAC ESOPHAGOGASTROST 4253 THORAC SM BOWEL INTERPOS	For the observed mortality, the hospital submits the observed deaths for esophagectomy cases in patients with esophageal cancer as identified using the population codes

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	Maintenance Measure #0361: Esophageal resection volume (IQI 1)	Endorsed Measure #0737: Survival predictor for esophagectomy surgery
		4254 THORAC ESOPHAGOENTER NEC 4255 THORAC LG BOWEL INTERPOS 4256 THORAC ESOPHAGOCOLOS NEC 4258 THORAC INTERPOSITION NEC 4259 THORAC ESOPHAG ANAST NEC 426 STERN ESOPHAG ANAST 4261 STERN ESOPHAGOESOPHAGOST 4262 STERN ESOPHAGOGASTROSTOM 4263 STERN SM BOWEL INTERPOS 4264 STERN ESOPHAGOENTER NEC 4265 STERN LG BOWEL INTERPOS 4266 STERN ESOPHAGOCOLOS NEC 4268 STERN INTERPOSITION NEC 4269 STERN ESOPHAG ANAST NEC OR ICD-9-CM gastrectomy procedure code: 4399 OTHER TOTAL GASTRECTOMY ONLY if accompanied by selected diagnosis codes 1500 MALIGNANT NEOPLASM OF ESOPHAGUS, CERVICAL 1501 MALIGNANT NEOPLASM OF ESOPHAGUS, THORACIC 1502 MALIGNANT NEOPLASM OF ESOPHAGUS, ABDOMINAL 1503 MALIGNANT NEOPLASM OF	

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
		ESOPHAGUS, UPPER THIRD OF 1504 MALIGNANT NEOPLASM OF ESOPHAGUS, MIDDLE THIRD OF 1505 MALIGNANT NEOPLASM OF ESOPHAGUS, LOWER THIRD OF 1508 MALIGNANT NEOPLASM OF ESOPHAGUS, OTHER SPECIFIED PART 1509 MALIGNANT NEOPLASM OF ESOPHAGUS, UNSPECIFIED Exclude cases: MDC 14 (pregnancy, childbirth, and puerperium)	
Denominator	Discharges, ages 18 years and older, with ICD-9-CM esophageal resection procedure code and a diagnosis code of esophageal cancer in any field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes. Time window: user defined; usually a calendar year	N/A	Included population: all hospital patients age 18 and older with esophageal cancer who had an esophagectomy. Time window: 12 months
Denominator Categories	Female, Male: 18 and older	Female, Male: 18 and older	
Denominator Details	ICD-9-CM esophageal resection procedure codes: 424 ESOPHAGECTOMY 4240 ESOPHAGECTOMY NOS 4241 PARTIAL ESOPHAGECTOMY 4242 TOTAL ESOPHAGECTOMY 425 THORAC ESOPHAG	N/A	For the volume predicted mortality, hospitals count the number of esophagectomy cases using the following codes. ICD-9-CM Procedure Codes for Esophagectomy 424 Esophagectomy 4240 Esophagectomy NOS

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
	ANAST 4251 THORAC ESOPHAGOESOPHAGOS 4252 THORAC ESOPHAGOGASTROST 4253 THORAC SM BOWEL INTERPOS 4254 THORAC ESOPHAGOENTER NEC 4255 THORAC LG BOWEL INTERPOS 4256 THORAC ESOPHAGOCOLOS NEC 4258 THORAC INTERPOSITION NEC 4259 THORAC ESOPHAG ANAST NEC 426 STERN ESOPHAG ANAST 4261 STERN ESOPHAGOESOPHAGOST 4262 STERN ESOPHAGOGASTROSTOM 4263 STERN SM BOWEL INTERPOS 4264 STERN ESOPHAGOENTER NEC 4265 STERN LG BOWEL INTERPOS 4266 STERN ESOPHAGOCOLOS NEC 4268 STERN INTERPOSITION NEC 4269 STERN ESOPHAG ANAST NEC ONLY if selected diagnosis codes: esophageal cancer (see below) gastrointestinal-related cancer (see below) OR: ICD-9-CM gastrectomy procedure code:		4241 Partial Esophagectomy 4242 Total Esophagectomy 4399 Total gastrectomy NEC For the observed mortality hospitals count the number of esophagectomy cases that also have an esophageal cancer diagnosis using the following codes. ICD-9-CM Codes for Esophageal Cancer 1500 MAL NEO CERVICAL ESOPHAG 1501 MAL NEO THORACIC ESOPHAG 1502 MAL NEO ABDOMIN ESOPHAG 1503 MAL NEO UPPER 3RD ESOPH 1504 MAL NEO MIDDLE 3RD ESOPH 1505 MAL NEO LOWER 3RD ESOPH 1508 MAL NEO ESOPHAGUS NEC 1509 MAL NEO ESOPHAGUS NOS

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
	4399 OTHER TOTAL GASTRECTOMY - ONLY if selected diagnosis codes: esophageal cancer (see below) Esophageal cancer: 1500 MALIGNANT NEOPLASM OF ESOPHAGUS, CERVICAL 1501 MALIGNANT NEOPLASM OF ESOPHAGUS, THORACIC 1502 MALIGNANT NEOPLASM OF ESOPHAGUS, ABDOMINAL 1503 MALIGNANT NEOPLASM OF ESOPHAGUS, UPPER THIRD OF 1504 MALIGNANT NEOPLASM OF ESOPHAGUS, MIDDLE THIRD OF 1505 MALIGNANT NEOPLASM OF ESOPHAGUS, LOWER THIRD OF 1508 MALIGNANT NEOPLASM OF ESOPHAGUS, OTHER SPECIFIED PART 1509 MALIGNANT NEOPLASM OF ESOPHAGUS, UNSPECIFIED Gastrointestinal cancer 1510 MALIGNANT NEOPLASM OF STOMACH, CARDIA 1978 SECONDARY MALIGNANT NEOPLASM OF RESPIRATORY AND		

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
	DIGESTIVE SYSTEMS, OTHER DIGESTIVE ORGANS AND SPLEEN 2301 CARCINOMA IN SITU OF DIGESTIVE ORGANS, ESOPHAGUS 2355 NEOPLASM OF UNCERTAIN BEHAVIOR OF DIGESTIVE AND RESPIRATORY SYSTEMS, OTHER AND UNSPECIFIED DIGESTIVE ORGANS		
Exclusions	Missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing) Transferring to another short-term hospital (DISP=20 MDC 14 (pregnancy, childbirth, and puerperium)	N/A	Patients without a diagnosis of esophageal cancer;
Exclusions Details	Exclude cases: • missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1 =missing) • transferring to another short-term hospital (DISP=2) • MDC 14 (pregnancy, childbirth, and puerperium)	N/A	Esophagectomy cases without an esophageal cancer diagnosis code
Risk Adjustment	The predicted value for each case is computed using GEE logistic regression and covariates for age (in 5-year age	No risk adjustment necessary	Method: We used an empirical Bayes approach to combine mortality rates with information on hospital volume at each

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
	groups), APR-DRG and MDC. The reference population used in the regression is the universe of discharges for states that participate in the HCUP State Inpatient Databases (SID) for the year 2007, a database consisting of approximately 35 million discharges from 43 states. The expected rate is computed as the sum of the predicted value for each case divided by the number of cases for the unit of analysis of interest (i.e., county or state). The risk adjusted rate is computed using indirect standardization as the observed rate divided by the expected rate, multiplied by the reference population rate. The Smoothed Rate is the risk-adjusted rate shrunken to the volume-specific rate and the prior year smoothed rate.		hospital. In traditional empirical Bayes methods, a point estimate (e.g., mortality rate observed at a hospital) is adjusted for reliability by shrinking it towards the overall mean (e.g., overall mortality rate in the population). We modified this traditional approach by shrinking the observed mortality rate back toward the mortality rate expected given the volume at that hospital—we refer to this as the "volume-predicted mortality". With this approach, the observed mortality rate is weighted according to how reliably it is estimated, with the remaining weight placed on the information regarding hospital volume [volume-predicted mortality]. Risk adjustment for patient characteristics is not used because in sensitivity analysis, composite measures based on an unadjusted mortality input and a risk-adjusted mortality input had a correlation of (.95) and thus were equally good at predicting future performance. The formula for calculating the survival predictor has two components, one is a volume predicted mortality rate, and the second is an observed mortality rate. The volume predicted mortality rate reflects the hospitals experience performing

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
			Esophagectomy surgeries (thus, it includes all Esophagectomy surgeries) and uses mortality for all hospitals at that specific volume to create the volume predicted mortality. The input data from the hospitals for this domain is a volume count of all Esophagectomys performed in the hospital. The second domain is the observed mortality, for this domain the population is narrowed to a homogenous group of esophagectomy with a diagnosis of cancer, the data needed for this domain is the number of observed deaths occurring for esophagectomy cases with cancer, within the inpatient setting. The general composite measure calculation is as follows: Predicted Survival = 1-Predicted Mortality Predicted Mortality = (weight)*(mortality) + (1-weight)*(volume predicted mortality) Volume predicted mortality* = intercept - coefficient*ln(caseload), where the intercepts and coefficients are derived from regression using the NIS data and the caseload comes from the Leapfrog Hospital Survey (answer to question #1 for each high-risk procedure). *Any negative values are reset to "0" Weight = mortality signal/(mortality signal +

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
			[mortality sigma/caseload]), where mortality signal and sigma are derived from the NIS data and the caseload comes from the Leapfrog Hospital Survey (answer to question #1 for each high-risk procedure).
Stratification	Observed rates may be stratified by age group, race/ethnicity categories, payer categories and sex.	N/A	N/A
Type Score	Rate/proportion	Count	
Algorithm	Each Inpatient Quality Indicator (IQI) expressed as a rate, is defined as outcome of interest/population at risk or numerator/denominator. The Quality Indicators software performs five steps to produce the IQI rates. 1) Discharge-level data is used to mark inpatient records containing outcomes of interest. 2) Identify populations at risk. For provider IQIs populations at risk are derived from hospital discharge records. 3) Calculate observed rates. Using output data from steps 1 and 2, IQI rates are calculated for user-specified combinations of stratifiers. 4) Risk adjust the IQI rates. Regression coefficients from a reference population database are applied to the observed rates in the risk-adjustment process. The risk-adjusted rates will then reflect the age and APR-DRG distribution	The volume is the number of discharges with a procedure for esophageal resection	

	Maintenance Measure #0360: Esophageal resection mortality rate (IQI 8)	**Maintenance Measure #0361:** Esophageal resection volume (IQI 1)	**Endorsed Measure #0737:** Survival predictor for esophagectomy surgery
	of data in the reference population. 5) Create multivariate signal extraction (MSX) smoothed rates. Shrinkage factors are applied to the risk-adjusted rates for each IQI in the MSX process. For each IQI, the shrinkage estimate reflects a reliability adjustment unique to each indicator. Full information on IQI algorithms and specification can be found at http://qualityindicators.ahrq.gov/iqi_download.htm.		
Data Source	Electronic administrative data/claims	Electronic administrative data/claims	Electronic administrative data/ claims
Level of Measurement /Analysis	Facility/agency	Facility/agency	Facility/agency
Care Settings	Hospital	Hospital	Hospital

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	Maintenance Measure #0218: Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time	**Endorsed Measure #0371:** Venous thromboembolism (VTE) prophylaxis
Status	Currently undergoing maintenance review	Endorsed 5/2008
Steward	Centers for Medicare & Medicaid Services	The Joint Commission
Description	Percentage of surgery patients who **received** appropriate Venous Thromboembolism (VTE) Prophylaxis within 24 hours prior to surgery to 24 hours after surgery end time.	This measure assesses the number of patients who **received** VTE prophylaxis or have documentation why no VTE prophylaxis was given the day of or the day after hospital admission or surgery end date for surgeries that start the day of or the day after hospital admission.
Type of Measure	Process	Process

Numerator	Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to Surgical Incision Time to 24 hours after Surgery End Time Appropriate prophylaxis according to Surgery Type: Intracranial Neurosurgery Any of the following: • Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS) • Low-dose unfractionated heparin (LDUH) Low molecular weight heparin (LMWH)2 • LDUH or LMWH2 combined with IPC or GCS General Surgery Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS General Surgery with a reason for not administering pharmacological prophylaxis Any of the following: • Graduated Compression stockings (GCS) • Intermittent pneumatic compression devices (IPC) Gynecologic Surgery Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (fondaparinux) • Intermittent pneumatic compression devices (IPC) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS Urologic Surgery Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH)	Patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given: the day of or the day after hospital admission, the day of or the day after surgery end date for surgeries that start the day of or the day after hospital admission. Time window:

	• Factor Xa Inhibitor (fondaparinux) • Intermittent pneumatic compression devices (IPC) • Graduated compression stockings (GCS) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS Elective Total Hip Replacement Any of the following started within 24 hours of surgery: • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin Elective Total Knee Replacement Any of the following: • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP) Hip Fracture Surgery Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin Elective Total Hip Replacement with a reason for not administering pharmacological prophylaxis Any of the following: • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP) Hip Fracture Surgery with a reason for not administering pharmacological prophylaxis Any of the following: • Graduated Compression Stockings (GCS) • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP) Time window: 24 hours prior to incision to 24 hours after surgery end time	

Numerator Details	Data Elements: Anesthesia Type VTE Prophylaxis VTE Timely	
Denominator	All selected surgery patients Time window: Entire inpatient admission	All patients. Inclusions: Not applicable Time window
Denominator Categories	Female, Male; ≥18 years of age	Female, Male; ≥18 years of age
Denominator Details	Data Elements: Admission Date Anesthesia End Date Anesthesia End Time Anesthesia Start Date Anesthesia Start Time Birthdate Clinical Trial Discharge Date ICD-9-CM Principal Diagnosis Code ICD-9-CM Principal Procedure Code Laparoscope Perioperative Death Preadmission Warfarin Reason for Not Administering VTE Prophylaxis	

Exclusions	Data elements Clinical trial Laparoscope Perioperative death Preadmission warfarin Reason for not administering VTE prophylaxis	• Patients less than 18 years of age Patients who have a length of stay (LOS) < two days and > 120 days Patients with Comfort Measures Only documented Patients enrolled in clinical trials Patients who are direct admits to intensive care unit (ICU), or transferred to ICU the day of or the day after hospital admission with ICU LOS = one day Patients with ICD-9-CM Principal Diagnosis Code of Mental Disorders or Stroke as defined in Appendix A, Table 7.01, 8.1 or 8.2 Patients with ICD-9-CM Principal or Other Diagnosis Codes of Obstetrics or VTE as defined in Appendix A, Table 7.02, 7.03 or 7.04 Patients with ICD-9-CM Principal Procedure Code of Surgical Care Improvement Project (SCIP) VTE selected surgeries as defined in Appendix A, Tables 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, 5.24
Exclusions Details	Excluded Populations: Patients less than 18 years of age Patients who have a Length of Stay greater than 120 days Burn patients (as defined in Appendix A, Table 5.14 for ICD-9-CM codes) Patients with procedures performed entirely by Laparoscope Patients enrolled in clinical trials Patients who are on warfarin prior to admission Patients whose ICD-9-CM principal procedure occurred prior to the date of admission Patients whose total surgery time is less than or equal to 60 minutes Patients with hospital length of stay less than or equal to 3 calendar days Patients who expire perioperatively Patients with reasons for not administering both mechanical and pharmacological prophylaxis Patients who did not receive VTE Prophylaxis (as defined in the Data	

	Dictionary)	
Risk Adjustment	No risk adjustment necessary	No risk adjustment necessary
Stratification	No stratification except by surgery type and those are Intracranial Neurosurgery Appendix A,Table 5.17 General Surgery Appendix A, Table 5.19 Gynecologic Surgery Appendix A, Table 5.20 Urologic Surgery Appendix A,Table 5.21 Elective Total Hip Replacement Appendix A,Table 5.22 Elective Total Knee Replacement Appendix A,Table 5.23 Hip Fracture Surgery Appendix A,Table 5.24	
Type Score	Rate/proportion	
Algorithm	SCIP- Venous Thromboembolism (VTE)-2: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery Numerator: Surgery patients who received Venous Thromboembolism (VTE) prophylaxis 24 hours prior to Anesthesia Start Time to 24 hours after Anesthesia End Time. Denominator: All selected surgery patients. Variable Key: Patient Age, Length of Stay (LOS), Surgery Length, Surgery Days 1.Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure. 2.Calculate Patient Age. The Patient Age, in years, is equal to the Admission Date minus the Birthdate. Use the month and day portion of admission date and birthdate to yield the most accurate age. 3.Check Patient Age a.If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not	

	be in the Measure Population. Stop processing. b.If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code. 4.Check ICD-9-CM Principal Procedure Code a.If the ICD-9-CM Principal Procedure Code is not on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and proceed to ICD-9-CM Principal Diagnosis Code. 5.Check ICD-9-CM Principal Diagnosis Code a.If the ICD-9-CM Principal Diagnosis Code is on Table 5.14, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Diagnosis Code is not on Table 5.14, continue processing and proceed to the LOS calculation. 6.Calculate LOS. LOS, in days, is equal to the Discharge Date minus the Admission Date. 7.Check LOS a.If the LOS is less than or equal to 3 days, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Calculation. Stop processing. b.If the LOS is greater than 3 days, continue processing and proceed to Laparoscope. 8.Check Laparoscope a.If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Laparoscope equals 1 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Laparoscope equals 2, continue processing and proceed to Clinical	

	Trial. 9.Check Clinical Trial a.If Clinical Trial is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Clinical Trial equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Clinical Trial equals No, continue processing and proceed to Preadmission Warfarin. 10.Check Preadmission Warfarin a.If Preadmission Warfarin is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Preadmission Warfarin equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Preadmission Warfarin equals No, continue processing and proceed to Anesthesia Start Date. 11.Check Anesthesia Start Date a.If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-13 b.If the Anesthesia Start Date equals Unable To Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation. 12.Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date. 13.Check Surgery Days a.If the Surgery Days is less than zero, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.	

	b.If the Surgery Days is greater than or equal to zero, continue processing and proceed to Perioperative Death. 14.Check Perioperative Death a.If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Perioperative Death equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Perioperative Death equals No, continue processing and proceed to Anesthesia Start Time. 15.Check Anesthesia Start Time a.If the Anesthesia Start Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If the Anesthesia Start Time equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If the Anesthesia Start Time equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Date. 16.Check Anesthesia End Date a.If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If the Anesthesia End Date equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If the Anesthesia End Date equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Time. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-14 17.Check Anesthesia End Time a.If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If the Anesthesia End Time equals	

	Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. c.If the Anesthesia End Time equals a Non Unable to Determine Value, continue processing and proceed to the Surgery Length calculation. 18.Calculate Surgery Length. Surgery Length, in minutes, is equal to the Anesthesia End Date and Anesthesia End Time minus the Anesthesia Start Date and Anesthesia Start Time. 19.Check Surgery Length a.If the Surgery Length is less than or equal to 60 minutes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. b.If the Surgery Length is greater than 60 minutes, continue processing proceed to Reason for Not Administering VTE Prophylaxis. 20.Check Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If Reason for Not Administering VTE Prophylaxis equals 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If Reason for Not Administering VTE Prophylaxis equals 1, 2, or 4, continue processing and proceed to VTE Prophylaxis. 21.Check VTE Prophylaxis a.If no values are populated in the VTE grid, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. b.If VTE Prophylaxis equals A, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing. c.If the VTE grid is populated with any of values 1, 2, 3, 4, 5, 6, 7, or 8, continue processing and proceed to recheck the ICD-9-CM Principal Procedure Code. Note: If VTE	

	Prophylaxis field is populated with an allowable value of 1, 2, 3, 4, 5, 6, 7, or 8 and the corresponding VTE Timely field is Missing, the entire case will be rejected by The Joint Commission and Centers for Medicare and Medicaid Services (CMS) warehouses. 22.Recheck ICD-9-CM Principal Procedure Code a.If the ICD-9-CM Principal Procedure Code is on Tables 5.17, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing. Proceed to step 26 and recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24. Do not recheck step 23 and step 25 VTE Prophylaxis or step 24 Reason for Not Administering VTE Prophylaxis for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 as steps 23 through 26 check for codes on Table 5.19 only. b.If the ICD-9-CM Principal Procedure Code is on Table 5.19, continue processing and recheck VTE Prophylaxis. 23.Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.19 a.If any VTE Prophylaxis equals 1, 2, or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 5, continue processing and recheck Reason for Not Administering VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 1, 2, or 5, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis. 24.Recheck Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue	

	processing and proceed to Anesthesia Type. 1.If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. 2.If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 3.If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis. b.If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and recheck VTE Prophylaxis. 25.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 3 or 4, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 3 or 4, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 3 and 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If none of the VTE Prophylaxis equals 3 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 26.Recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code was not on Table 5.19 a.If the ICD-9-CM Principal Procedure Code is on Table 5.17, continue processing and recheck VTE Prophylaxis. 1.If any VTE Prophylaxis equals 1, 2, or 3, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values	

	corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis equals 1, 2, or 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code. 27.Recheck ICD-9-CM Principal Procedure Code for Tables 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17 or 5.19 a.If the ICD-9-CM Principal Procedure Code is on Table 5.20, continue processing and recheck VTE Prophylaxis. 1.If any VTE Prophylaxis equals 1, 2, 3 or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3 and 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis equals 1, 2, 3, or 5, the case will proceed to a Measure Category Assignment of D and will be in the	

	Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code. 28.Recheck ICD-9-CM Principal Procedure Code for Tables 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, or 5.20 a.If the ICD-9-CM Principal Procedure Code is on Table 5.21, continue processing and recheck VTE Prophylaxis. 1.If any VTE Prophylaxis equals 1, 2, 3, 4, or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3 or 4 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3 and 4 and 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis equals 1, 2, 3, 4, or 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-18 29.Recheck ICD-9-CM Principal Procedure Code for Tables 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20, or 5.21 a.If the ICD-9-CM Principal Procedure Code is on Table 5.22, continue processing and recheck VTE	

	Prophylaxis. b.If the ICD-9-CM Principal Procedure Code is on Tables 5.23 or 5.24, continue processing. Proceed to step 34 and recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24. Do not recheck steps 30, 31 and 33 VTE Prophylaxis or step 32 Reason for Not Administering VTE Prophylaxis. 30.Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.22 a.If any VTE Prophylaxis equals 2, 5, 6, or 8, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 2 or 5 or 6 or 8, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 2 and 5 and 6 and 8, continue processing and recheck VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 2, 5, 6, or 8, continue processing and proceed to recheck VTE Prophylaxis. 31.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 1, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 1, continue processing and check ICD-9-CM Principal or Other Diagnosis Codes. i.If any of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If none of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, continue processing and recheck Reason for Not Administering	

	VTE Prophylaxis. 2.If VTE Timely equals No for VTE Prophylaxis of 1, continue processing and recheck Reason for Not Administering VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 1, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-VTE-2-19 32.Recheck Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type. 1.If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. 2.If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 3.If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis. b.If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis. 33.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 3 or 7, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 3 or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 3 and 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If none of the VTE Prophylaxis	

	equals 3 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 34.Recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20, 5.21, or 5.22 a.If the ICD-9-CM Principal Procedure Code is on Table 5.23, continue processing and recheck VTE Prophylaxis. 1.If Any VTE Prophylaxis is equal to 2, 3, 5, 6, 7, or 8, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. i.If VTE Timely equals Yes for VTE Prophylaxis of 2 or 3 or 5 or 6 or 7 or 8, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. ii.If VTE Timely equals No for VTE Prophylaxis of 2 and 3 and 5 and 6 and 7 or 8, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 2.If none of the VTE Prophylaxis is equal to 2, 3, 5, 6, 7, or 8, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If the ICD-9-CM Principal Procedure Code is on Table 5.24, continue processing and recheck VTE Prophylaxis. 35.Recheck VTE Prophylaxis a.If any VTE Prophylaxis equals 1, 2, 5, 6, or 8, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 5 or 6 or 8, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE	

	Prophylaxis of 1 and 2 and 5 and 6 and 8, continue processing and recheck Reason for Not Administering VTE Prophylaxis. b.If none of the VTE Prophylaxis equals 1, 2, 5, 6, or 8, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis. 36.Recheck Reason for Not Administering VTE Prophylaxis a.If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type. 1.If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing. 2.If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. 3.If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis. b.If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis. 37.Recheck VTE Prophylaxis a.If none of the VTE Prophylaxis equals 3, 4, or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing. b.If any VTE Prophylaxis equals 3, 4, or 7, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis. 1.If VTE Timely equals Yes for VTE Prophylaxis of 3 or 4 or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing. 2.If VTE Timely equals No for VTE Prophylaxis of 3 or 4 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.	

Data Source	Electronic clinical data, electronic health/medical record, paper medical record/flow-sheet	Electronic administrative data/claims, electronic health/medical record, paper medical record/flow-sheet
Level of Measurement /Analysis	Facility/agency; Program: Quality improvement organization (QIO); Can be measured at all levels	Facility/agency
Care Settings	Hospital	Hospital