



Measure Information

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

Brief Measure Information

NQF #: 1790

Corresponding Measures:

De.2. Measure Title: Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer

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

De.3. Brief Description of Measure: Percentage of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

1b.1. Developer Rationale: Providing outcomes data to participating thoracic surgery sites allows benchmarking of practice group results against the STS national results and allows demonstration of improvement when QI efforts are undertaken. These outcomes data aid clinicians and patients in making informed clinical decisions and also enable them to compare risk-adjusted outcomes for quality improvement purposes.

S.4. Numerator Statement: Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

S.6. Denominator Statement: Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer

S.8. Denominator Exclusions: Patients were excluded if they had an extrapleural pneumonectomy, completion pneumonectomy, carinal pneumonectomy, occult carcinoma or benign disease on final pathology, or an urgent, emergent, or palliative operation. Furthermore, patients with missing age, sex, discharge mortality status, and predicted forced expiratory volume in 1 second were also excluded.

De.1. Measure Type: Outcome

S.17. Data Source: Other, Registry Data

S.20. Level of Analysis: Facility

IF Endorsement Maintenance – Original Endorsement Date: Aug 09, 2012 **Most Recent Endorsement Date:** Aug 09, 2012

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

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

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? n/a

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

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

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

[NQF_evidence_attachment_STS-1790-111517-v2.docx](#)

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

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

No

1b. Performance Gap

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

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

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

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

Providing outcomes data to participating thoracic surgery sites allows benchmarking of practice group results against the STS national results and allows demonstration of improvement when QI efforts are undertaken. These outcomes data aid clinicians and patients in making informed clinical decisions and also enable them to compare risk-adjusted outcomes for quality improvement purposes.

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

The endpoint of mortality or major morbidity occurred in 9.5% of eligible patients. There is no overlap in credible intervals for hospital-specific SIR between some of the best performing sites (3.5%; 8 of 231 sites with upper limit below 1) and worst performing sites (6.9%; 16 of 231 sites with lower limit above 1), indicating that this model provides meaningful discrimination between best and worst performers.

Dates: January 1, 2012 through December 31, 2014

Data/Sample: The population included 27,844 records from 231 hospitals. Hospital-specific sample sizes ranged from 1 to 852 records per hospital (mean=121, median=85, IQR=[36, 165]).

Distribution of hospital-specific estimates of standardized incidence ratio (SIR) for composite of mortality and morbidity:

Minimum	0.47
1st quartile	0.90
Median	1.00
Mean	1.05
3rd quartile	1.22
Maximum	2.37

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

n/a (see data reported in 1b2)

1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity,

gender, age, insurance status, socioeconomic status, and/or disability. (*This is required for maintenance of endorsement. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included.*) For measures that show high levels of performance, i.e., “topped out”, disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.

Data/Sample: The population included 27,844 records from 231 hospitals.

Dates: January 1, 2012 through December 31, 2014

Race: White 24,099; Black 2,369; Other 1,217

Incidence of mortality or major morbidity endpoints:

White: 9.8%, 95% CI [9.4,% 10.1%]

Black: 8.9%, 95% CI [7.8%, 10.1%]

Other: 6.9%, 95% CI [5.6, 8.5%]

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

n/a (see data reported in 1b4)

2. Reliability and Validity—Scientific Acceptability of Measure Properties

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

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

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

Cancer, Cancer : Lung, Esophageal, Surgery, Surgery : Thoracic Surgery

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

Safety, Safety : Complications

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

Elderly

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

http://www.sts.org/sites/default/files/documents/STSThoracicDataSpecsV2_3.pdf

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

This is not an eMeasure Attachment:

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

Attachment Attachment: [STSThoracicDataSpecsV2_3.pdf](#)

S.2c. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales,

etc.)? Attach copy of instrument if available.

No, this is not an instrument-based measure **Attachment:**

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

Not an instrument-based measure

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

Yes

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

Among postoperative complications included in the numerator statement, "bleeding requiring reoperation" was replaced by "unexpected return to the operating room." Bleeding is only one of many possible reasons for a reoperation; other reasons may include prolonged air leak and chylothorax. STS General Thoracic surgeon leaders felt that the new, expanded definition of reoperation ("unexpected return to the operating room") better reflects the scope of this category of postoperative complications.

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

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

Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

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

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

Number of patients undergoing elective lung resection for lung cancer for whom:

1. Postoperative events (POEvents - STS GTS Database, v 2.2, sequence number 1710) is marked "Yes" and one of the following items is marked:

- a. Reintubation (Reintube - STS GTS Database, v 2.2, sequence number 1850)
- b. Need for tracheostomy (Trach - STS GTS Database, v 2.2, sequence number 1860)
- c. Initial ventilator support > 48 hours (Vent - STS GTS Database, v 2.2, sequence number 1840)
- d. Acute Respiratory Distress Syndrome (ARDS - STS GTS Database, v 2.2, sequence number 1790)
- e. Pneumonia (Pneumonia - STS GTS Database, v 2.2, sequence number 1780)
- f. Pulmonary Embolus (PE - STS GTS Database, v 2.2, sequence number 1820)
- g. Bronchopleural Fistula (Bronchopleural - STS GTS Database, v 2.2, sequence number 1810)
- h. Myocardial infarction (MI - STS GTS Database, v 2.2, sequence number 1900)

Or

2. Unexpected return to the operating room (ReturnOR - STS GTS Database, Version 2.2, sequence number 1720) is marked "yes"

Or

3. One of the following fields is marked "dead"

- a. Discharge status (MtDCStat - STS GTS Database, Version 2.2, sequence number 2200);
- b. Status at 30 days after surgery (Mt30Stat - STS GTS Database, Version 2.2, sequence number 2240)

Please see STS General Thoracic Surgery Database Data Collection Form, Version 2.3-
http://www.sts.org/sites/default/files/documents/STSThoracicDCF_V2_3_MajorProc_Annotated.pdf

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

Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer

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

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

- 1. Lung cancer (LungCancer - STS GTS Database, v 2.2, sequence number 830) is marked “yes” and Category of Disease – Primary (CategoryPrim - STS GTS Database, v 2.2, sequence number 1300) is marked as one of the following:

(ICD-9, ICD-10)

Lung cancer, main bronchus, carina (162.2, C34.00)

Lung cancer, upper lobe (162.3, C34.10)

Lung cancer, middle lobe (162.4, C34.2)

Lung cancer, lower lobe (162.5, C34.30)

Lung cancer, location unspecified (162.9, C34.90)

- 2. Patient has lung cancer (as defined in #1 above) and primary procedure is one of the following CPT codes:

Thoracoscopy, surgical; with lobectomy (32663)

Thoracoscopy with therapeutic wedge resection (eg mass or nodule) initial, unilateral (32666)

Thoracoscopy with removal of a single lung segment (segmentectomy) (32669)

Thoracoscopy with removal of two lobes (bilobectomy) (32670)

Thoracoscopy with removal of lung, pneumonectomy (32671)

Thoracotomy with therapeutic wedge resection (eg mass nodule) initial (32505)

Removal of lung, total pneumonectomy; (32440)

Removal of lung, single lobe (lobectomy) (32480)

Removal of lung, two lobes (bilobectomy) (32482)

Removal of lung, single segment (segmentectomy) (32484)

Removal of lung, sleeve lobectomy (32486)

- 3. Status of Operation (Status - STS General Thoracic Surgery Database, Version 2.2, sequence number 1420) is marked as “Elective”

- 4. Only analyze the first operation of the hospitalization meeting criteria 1-3

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

Patients were excluded if they had an extrapleural pneumonectomy, completion pneumonectomy, carinal pneumonectomy, occult carcinoma or benign disease on final pathology, or an urgent, emergent, or palliative operation. Furthermore, patients with missing age, sex, discharge mortality status, and predicted forced expiratory volume in 1 second were also excluded.

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

Cases removed from calculations if any of following fields are checked on the data collection form:

Removal of lung, sleeve (carinal) pneumonectomy (32442)
Removal of lung, total pneumonectomy; extrapleural (32445)
Removal of lung, completion pneumonectomy (32488)

OR if either of the following fields are checked:

Carcinoid tumor of bronchus and lung; benign, typical (209.61., D34.090)
Lung tumor, benign (212.3, D14.30)

OR if Emergent, Urgent, or Palliative is checked under "Status of Operation"

Only general thoracic procedures coded as primary lung or primary esophageal cancer are included in measure calculations, so occult carcinoma is effectively excluded.

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

n/a

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

Statistical risk model

If other:

S.12. Type of score:

Rate/proportion

If other:

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

Better quality = Lower score

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

Target population is patients undergoing elective lung resection for lung cancer. Emergency procedures were excluded. Outcome is operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location) or occurrence of any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, or myocardial infarction. Analysis considered 27,844 patients with procedures between 01/01/2012 and 12/31/2014 (36 months). Risk adjustment was achieved with a Bayesian hierarchical model with composite of the above postoperative complications as the outcome. The measure score was estimated with this model.

For additional information, please review the risk model in the attachment. (Fernandez, et. al. 2016.)

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

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

n/a

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

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

n/a

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

If other, please describe in S.18.

[Other, Registry Data](#)

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

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

[STS General Thoracic Surgery Database, Version 2.3](#)

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

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

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

[Facility](#)

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

[Inpatient/Hospital](#)

If other:

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

2. Validity – See attached Measure Testing Submission Form

[NQF_testing_attachment_STS-1790-111517-Revised1121.docx](#)

2.1 For maintenance of endorsement

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

[Yes](#)

2.2 For maintenance of endorsement

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

[Yes](#)

2.3 For maintenance of endorsement

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

[Yes - Updated information is included](#)

3. Feasibility

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

3a. Byproduct of Care Processes

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

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

generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition, Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims), Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry)
If other:

3b. Electronic Sources

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

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

ALL data elements are in defined fields in a combination of electronic sources

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

n/a

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

Attachment:

3c. Data Collection Strategy

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

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

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

Missing data are sought by the DCRI from participants when the data are initially sent to DCRI for analysis.

Data are collected continuously by the participating sites and harvested by the DCRI twice yearly. Reports are then sent back to the sites about 3 months after a harvest.

No individual patient identifiers are collected by the DCRI.

Data Collection:

Participants of the STS General Thoracic Surgery Database generally have data managers on staff to collect these data. Costs to develop the measure included volunteer thoracic surgeons' time, STS staff time, and DCRI statistician and project management time.

Other fees:

STS General Thoracic Surgery Database participant surgeons pay an annual participant fee of \$550 or \$700, depending on whether the participant is an STS member or not. STS membership thus provides surgeons with a 21% discount on the non-member database participation fee.

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

See 3c.1

4. Usability and Use

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

4a. Accountability and Transparency

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

4.1. Current and Planned Use

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

Specific Plan for Use	Current Use (for current use provide URL)

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

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

See 4a1.2

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

STS is actively promoting public reporting of the STS adult cardiac, congenital heart, and general thoracic surgery performance measures. This is consistent with the explicitly stated STS philosophy that "As a national leader in health care transparency and accountability, The Society of Thoracic Surgeons believes that the public has a right to know the quality of surgical outcomes." (<http://www.sts.org/registries-research-center/sts-public-reporting>) In our efforts to operationalize public reporting, the STS Public Reporting Task Force has and will continue to develop public report cards that are consumer centric. Public reporting remains a top priority for the Society, and STS is striving for even stronger involvement among Database participants.

Currently, more than 650 Adult Cardiac Surgery Database (ACSD) participants voluntarily consent to be a part of the STS Public Reporting and more than 550 ACSD participants have consented to report publicly via the Consumer Reports public reporting initiative. Additionally, more than 100 Congenital Heart Surgery Database (CHSD) participants are currently enrolled in STS Public Reporting.

As of July 2017, General Thoracic Surgery Database (GTSD) participants were included in the Public Reporting initiative and more than 250 participants currently consent to report outcomes publicly on the STS website. This includes discharge mortality rate and median postoperative length of stay for lobectomy procedures for lung cancer, including scores and star ratings for the Lobectomy for Lung Cancer Composite Measure in addition to its domains of 1) absence of mortality, and 2) absence of major complication. Participant outcomes are published alongside GTSD overall outcomes and National Inpatient Sample (NIS) outcomes.

-ACSD public reporting online may be found here: <http://publicreporting.sts.org/acsd>

-CHSD public reporting online may be found here: <http://publicreporting.sts.org/chsd>

-GHSD public reporting online may be found here: <http://publicreporting.sts.org/gtsd>

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

See 4a1.2

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

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

STS's combined mortality and morbidity model for pulmonary resection for lung cancer is important and appropriate for public reporting for the following reasons:

- 1.) lung cancer resection is the most common category of surgical procedures that a thoracic surgeon performs;
- 2.) these procedures are therefore useful and appropriate to use as a benchmark for performance by general thoracic surgery programs. By providing surgeons and teams with risk-adjusted results, they can identify how they are performing compared with other programs in the STS General Thoracic Database, which generally includes the top thoracic programs in the nation. This will assist them in focusing performance improvement efforts. Also, when publicly reported, the outcomes for these common procedures provide patients and their families with comparative performance information to aid in selection of a provider;
- 3.) major morbidity is relatively common after lung resection; however, although mortality is rare, it should be captured as well in an outcome measure, thereby identifying ALL adverse events after lung resection;
- 4.) this measure is reported in an easy to understand format which summarizes the results of all participants who were included in the analysis. The participant's score is illustrated graphically in relation to the 25th, 50th and 75th percentiles of the distribution across participants, and is accompanied by the 95% Bayesian credible interval. Surgeons easily grasp this result and the visual display powerfully shows them just where they perform compared to their peers on a bi-annual basis. In addition, these risk-adjusted results allow surgeons to compare their patients' outcomes with national benchmarks and to initiate QI efforts as needed.

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

See 4a2.1.1

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

Describe how feedback was obtained.

The general thoracic surgeons from across the U.S. who comprise the STS General Thoracic Surgery Task Force meet periodically to discuss the participant reports and to consider potential enhancements to the GTSD. Additions/clarifications to the data collection form and to the content/format of the participant reports are discussed and implemented as appropriate.

Most recently, STS surgeon members have expressed interest in real-time, online data updates, which has led to the development of dashboard-type reporting on STS.org. The general thoracic dashboard is scheduled for launch in 2018.

Also, general thoracic public reporting was initiated in the summer of 2017 (<http://publicreporting.sts.org/gtsd>), making star ratings for consenting participant groups available to participants as well as the public.

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

See 4a2.2.1

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

Given the very recent launch of general thoracic public reporting, the STS has not yet received sufficient feedback from non-participants to be able to assess the impact of the public reporting initiative.

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

See Specifications section, S.3.2, regarding modification in postoperative complications included in numerator since most recent NQF review of this measure.

Improvement

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

4b1. Refer to data provided in 1b but do not repeat here. Discuss any progress on improvement (trends in performance results,

number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included.)

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

Operative mortality in the STS General Thoracic Surgery Database has decreased from 2.2% in the years 2002 to 2008 to 1.4% from 2012 to 2014. These data represent the highest quality lung cancer surgery in the United States. It is important to recognize that a large proportion of the general thoracic surgery in the US is not performed by general thoracic surgeons certified by the American Board of Thoracic Surgery. Results by STS General Thoracic Database participants, who are almost all ABTS certified, are generally superior to those of surgeons performing these procedures who do not participate in the GTSD, and who are often not ABTS certified.

Kozower and colleagues (Ann Thorac Surg 2010) have previously demonstrated that compared with the Nationwide Inpatient Sample database, from 2002 to 2008, patients in the GTSD had lower unadjusted discharge mortality rates, median length of stay, and pulmonary complication rates for lobectomy.

The major morbidity rate has increased from 8.6% to 9.1% during the same time. A potential explanation for this observation is more complete coding of complications by data abstractors as the result of education efforts from STS, as well as inclusion of unexpected return to the operating room for any reason instead of only for bleeding.

Fernandez FG, Kosinski AS, Burfeind W, Park B, DeCamp MM, Seder C, Marshall B, Magee MJ, Wright CD, Kozower BD. The Society of Thoracic Surgeons Lung Cancer Resection Risk Model: Higher Quality Data and Superior Outcomes. Ann Thorac Surg. 2016 Aug;102(2):370-7.

Kozower BD, Sheng S, O'Brien SM, et al. STS database risk models: predictors of mortality and major morbidity for lung cancer resection. Ann Thorac Surg 2010;90:875-83.

4b2. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

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

We are not aware of any unexpected findings associated with implementation of this measure.

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

n/a

5. Comparison to Related or Competing Measures

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

5. Relation to Other NQF-endorsed Measures

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

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

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

This measure is related conceptually to the STS Lobectomy for Lung Cancer Composite Score measure, which we are submitting for initial NQF review in the fall 2017 Surgery endorsement cycle. The numerators for both measures include the same list of

postoperative complications, but the outcomes for the Lobectomy Composite measure are grouped into two domains (operative mortality and major complications) and the measure is structured to provide general thoracic surgeons with a "star rating." Please also see 5a.2 below.

5a. Harmonization of Related Measures

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

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

Are the measure specifications harmonized to the extent possible?

Yes

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

Measure #1790 includes a broader range of lung resection procedures than the Lobectomy Composite, and therefore includes a larger number of cases and potentially provides performance data to more general thoracic surgeons. Of the two measures, only the Lobectomy Composite is currently publicly reported.

5b. Competing Measures

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

OR

Multiple measures are justified.

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

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

n/a

Appendix

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

Attachment Attachment: [FernandezKosinskiKozower_lung_cancer_risk_model_2016.pdf](#)

Contact Information

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

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

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

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

Additional Information

Ad.1 Workgroup/Expert Panel involved in measure development

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

Members of the STS Task Force on Quality Initiatives provide surgical expertise as needed. The STS Workforce on National Databases meets at the STS Annual Meeting and reviews the measures on a yearly basis. Changes or updates to the measure will be at the recommendation of the Workforce.

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released: 2010

Ad.3 Month and Year of most recent revision: 02, 2016 Ad.4 What is your frequency for review/update of this measure? annually Ad.5 When is the next scheduled review/update for this measure? 01, 2018
Ad.6 Copyright statement: Ad.7 Disclaimers:
Ad.8 Additional Information/Comments: