



## 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 subcriterion 1b).

### Brief Measure Information

**NQF #:** 0460

**Corresponding Measures:**

**De.2. Measure Title:** Risk-Adjusted Morbidity and Mortality for Esophagectomy for Cancer

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

**De.3. Brief Description of Measure:** Percentage of patients aged 18 years and older undergoing elective esophagectomy for esophageal cancer who developed any of the following postoperative conditions: bleeding requiring reoperation, anastomosis leak requiring medical or surgical treatment, reintubation, ventilation >48 hours, pneumonia, or discharge mortality

**1b.1. Developer Rationale:** It is important for surgeons to be able to compare their surgical outcomes to those of peer institutions as a means of assessing results and improving quality of care. Measuring risk adjusted morbidity and mortality of patients undergoing esophagectomy for cancer provides surgeons and institutions the opportunity to evaluate outcomes and subsequently design quality improvement initiatives to address identified deficits. Utilization of the insight gained should promote improved patient outcome.

**S.4. Numerator Statement:** Number of patients aged 18 years and older undergoing elective esophagectomy for esophageal cancer who developed any of the following postoperative conditions: bleeding requiring reoperation, anastomosis leak requiring medical or surgical treatment, reintubation, ventilation >48 hours, pneumonia, or discharge mortality.

**S.7. Denominator Statement:** Number of patients aged 18 years and older undergoing elective esophagectomy for esophageal cancer

**S.10. Denominator Exclusions:** None

**De.1. Measure Type:** Outcome

**S.23. Data Source:** Registry Data

**S.26. Level of Analysis:** Clinician : Group/Practice, Facility

**IF Endorsement Maintenance – Original Endorsement Date:** Jul 31, 2008 **Most Recent Endorsement Date:** Jul 31, 2008

**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 subcriteria to pass this criterion and be evaluated against the remaining criteria.**

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

[1a. Evidence - 0460\\_MM\\_for\\_Esophagectomy\\_for\\_Cancer.docx](#)

**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., the benefits or improvements in quality envisioned by use of this measure)

It is important for surgeons to be able to compare their surgical outcomes to those of peer institutions as a means of assessing results and improving quality of care. Measuring risk adjusted morbidity and mortality of patients undergoing esophagectomy for cancer provides surgeons and institutions the opportunity to evaluate outcomes and subsequently design quality improvement initiatives to address identified deficits. Utilization of the insight gained should promote improved patient outcome.

**1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis.** (This is required for endorsement maintenance. 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 included). This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

Please see the Appendix.

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

N/A

**1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.** (This is required for endorsement maintenance. 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 subcriterion on improvement (4b.1) under Usability and Use.

Please see the Appendix.

**1b.5. If no or limited data on disparities from the measure as specified is reported in 1b4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations.**

N/A

**1c. High Priority** (previously referred to as High Impact)

The measure addresses:

- a specific national health goal/priority identified by DHHS or the National Priorities Partnership convened by NQF;
- OR
- a demonstrated high-priority (high-impact) aspect of healthcare (e.g., affects large numbers of patients and/or has a substantial impact for a smaller population; leading cause of morbidity/mortality; high resource use (current and/or future); severity of illness; and severity of patient/societal consequences of poor quality).

**1c.1. Demonstrated high priority aspect of healthcare**

Affects large numbers, A leading cause of morbidity/mortality, Frequently performed procedure, High resource use, Patient/societal consequences of poor quality, Severity of illness

**1c.2. If Other:**

**1c.3. Provide epidemiologic or resource use data that demonstrates the measure addresses a high priority aspect of healthcare.**

**List citations in 1c.4.**

Esophageal cancer is an aggressive disease with a generally poor prognosis. The incidence of esophageal adenocarcinoma is increasing faster than any other malignancy in the United States. In 2015, there were an estimated 16,980 people diagnosed with esophageal cancer.

Esophagectomy, a relatively high morbidity and mortality operation, remains a key therapy in treating patients with localized esophageal cancer. The 30-day mortality rate following esophagectomy ranges between 2.7% and 11%. Within the STS GTSD, 24% of patients undergoing esophagectomy for cancer experienced major postoperative morbidity or death. Those with a major morbidity had a hospital discharge mortality of 11% while those patients without a major morbidity had a mortality rate of zero. This analysis identified a number of statistically significant predictors of major morbidity or mortality after esophagectomy for cancer. These factors included age, race, cardiac disease, impaired lung function, peripheral vascular disease, hypertension,

diabetes, functional status, smoking status, and steroid use. Recognition of these predictors preoperatively, and modifying them when possible may provide improved outcomes, as measured by mortality, length of stay, postoperative quality of life, overall costs and resource utilization. Some of these preoperative predictors are modifiable, such as smoking status, and have been shown to reduce complication rates. Pulmonary complications are the major source of morbidity and mortality after esophageal resection, and numerous studies have identified various associated with these complications. Preoperative factors affecting pulmonary complications include advanced age, poor nutritional status, and poor cardiopulmonary reserve. Intraoperative factors associated with increased rates of pulmonary complications include increased blood loss, excessive fluid administration, prolonged operative times, advanced or proximal esophageal tumors, and more extensive operations, including the McKeown resection with three-field lymph node dissection. Postoperative factors associated with pulmonary complications include the development of atrial fibrillation, recurrent laryngeal nerve injury, and aspiration or other abnormality of deglutition. Enhanced recovery pathways and fast-track protocols, have been shown to reduce major morbidity and length of stay without increasing mortality or readmissions. Knowing their rate of risk-adjusted morbidity and mortality after esophagectomy gives thoracic programs the opportunity to design quality improvement initiatives around deficiencies.

#### 1c.4. Citations for data demonstrating high priority provided in 1a.3

- Tomaszek S, Cassivi SD. Esophagectomy for the treatment of esophageal cancer. *Gastroenterol Clin North Am*. 2009 Mar;38(1):169-81.
- SEER database. March 8, 2016. Retrieved from <http://seer.cancer.gov/statfacts/html/esoph.html>.
- Wright CD, Kucharczuk JC, O'Brien SM, Grab JD, Allen MS. Society of Thoracic Surgeons General Thoracic Surgery Database. Predictors of major morbidity and mortality after esophagectomy for esophageal cancer: a Society of Thoracic Surgeons General Thoracic Surgery Database risk adjustment model. *J Thorac Cardiovasc Surg*. 2009 Mar;137(3):587-95.
- Kassis Edmund S, Kosinski Andrzej S, Ross Jr. Patrick, Koppes Katherine E, Donahue James M, Daniel Vincent C. Predictors of Anastomotic Leak After Esophagectomy: An Analysis of The Society of Thoracic Surgeons General Thoracic Database. *Ann Thorac Surg*. 2013 Dec;96(6):1919-26. doi: 10.1016/j.athoracsur.2013.07.119. Epub 2013 Sep 24
- Schieman C, Wigle DA, Deschamps C, Nichols Iii FC, Cassivi SD, Shen KR, Allen MS. Patterns of operative mortality following esophagectomy. *Dis Esophagus*. 2012 Sep-Oct;25(7):645-51. doi: 10.1111/j.1442-2050.2011.01304.x. Epub 2012 Jan 13
- Hii MW, Smithers BM, Gotley DC, Thomas JM, Thomson I, Martin I, Barbour AP. Impact of postoperative morbidity on long-term survival after oesophagectomy. *Br J Surg*. 2013 Jan;100(1):95-104. doi: 10.1002/bjs.8973. Epub 2012 Nov 12
- Derogar M, Orsini N, Sadr-Azodi O, Lagergren P. Influence of major postoperative complications on health-related quality of life among long-term survivors of esophageal cancer surgery. *J Clin Oncol*. 2012 May 10;30(14):1615-9. doi: 10.1200/JCO.2011.40.3568. Epub 2012 Apr 2.
- Carrott PW, Markar SR, Kuppusamy MK, Traverso LW, Low DE. Accordion severity grading system: assessment of relationship between costs, length of hospital stay, and survival in patients with complications after esophagectomy for cancer. *J Am Coll Surg*. 2012 Sep;215(3):331-6. doi: 10.1016/j.jamcollsurg.2012.04.030. Epub 2012 Jun 8.
- Yoshida N, Baba Y, Hiyoshi Y, et al. Duration of Smoking Cessation and Postoperative Morbidity After Esophagectomy for Esophageal Cancer: How Long Should Patients Stop Smoking Before Surgery? *World J Surg* 2016 Jan;40(1):142-7.
- Atkins BZ, D'Amico TA. Respiratory complications after esophagectomy. *Thorac Surg Clin* 2006 Feb;16(1):35-48.
- Casado D, López F, Martí R. Perioperative fluid management and major respiratory complications in patients undergoing esophagectomy. *Dis Esophagus*. 2010 Sep;23(7):523-8.
- Markar SR, Karthikesalingam A, Low DE. Enhanced recovery pathways lead to an improvement in postoperative outcomes following esophagectomy: systematic review and pooled analysis. *Dis Esophagus* 2015 Jul;28(5):468-75.
- Shewale JB, Correa AM, Baker CM, et al. Impact of a Fast-track Esophagectomy Protocol on Esophageal Cancer Patient Outcomes and Hospital Charges. *Ann Surg* 2015 Jun;261(6):1114-23.

**1c.5. If a PRO-PM (e.g. HRQoL/functional status, symptom/burden, experience with care, health-related behaviors), provide evidence that the target population values the measured PRO and finds it meaningful. (Describe how and from whom their input was obtained.)**

N/A

## 2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. **Measures must be judged to meet the subcriteria 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

**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.)

See Appendix

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

This is not an eMeasure Attachment:

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

Attachment Attachment: S.15.\_Detailed\_risk\_model\_specifications\_-\_0460\_MM\_for\_Esophagectomy\_for\_Cancer.docx

**S.3. For endorsement maintenance**, please briefly describe any changes to the measure specifications since last endorsement date and explain the reasons.

The denominator time window was changed from 12 months to 36 months. The 36-month time window is necessary to obtain appropriate sample sizes for this measure.

**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)

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

Number of patients aged 18 years and older undergoing elective esophagectomy for esophageal cancer who developed any of the following postoperative conditions: bleeding requiring reoperation, anastomosis leak requiring medical or surgical treatment, reintubation, ventilation >48 hours, pneumonia, or discharge mortality.

**S.5. Time Period for Data** (What is the time period in which data will be aggregated for the measure, e.g., 12 mo, 3 years, look back to August for flu vaccination? Note if there are different time periods for the numerator and denominator.)

Numerator –

- Complications: During hospitalization regardless of length of stay or within 30 days of surgery if discharged
- Discharge mortality: during the same hospitalization as surgery regardless of timing

Denominator – 36 months

**S.6. 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, 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.

Number of patients undergoing elective esophagectomy for esophageal cancer for whom:

1. Unexpected return to the operating room (ReturnOR - STS General Thoracic Surgery Database (GTSD), Version 2.2, sequence number 1720) is marked “yes” and primary reason for return to OR (ReturnORRsn – STS GTSD, Version 2.2, sequence number 1730) is marked “bleeding” or “anastomatic leak following esophageal surgery”

or

2. Postoperative events (POEvents - STS GTSD v 2.2, sequence number 1710) is marked “Yes” and one of the following items is marked:
- a. Anastomosis requiring medical treatment only (i.e., interventional radiation drainage, NPO, antibiotics) (AnastoMed- STS GTSD v 2.2, sequence number 1950)
  - b. Reintubate, Reintube (STS GTSD v 2.2, sequence number 1850)
  - c. Initial ventilator support > 48 hours (Vent- STS GTSD v 2.2, sequence number 1840)
  - d. Pneumonia (Pneumonia- STS GTSD v 2.2, sequence number 1780)
  - e. Discharge Status (MtDCStat - STS GTSD v 2.2, sequence number 2200) is marked as “Dead”

**S.7. Denominator Statement** (Brief, narrative description of the target population being measured)

Number of patients aged 18 years and older undergoing elective esophagectomy for esophageal cancer

**S.8. Target Population Category** (Check all the populations for which the measure is specified and tested if any):

Elderly, Populations at Risk : Individuals with multiple chronic conditions

**S.9. Denominator Details** (All information required to identify and calculate the target population/denominator such as definitions, 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)

1. Esophageal cancer (EsophCancer- STS GTSD v 2.2, sequence number 1140) is marked “yes” and Category of Disease – Primary (CategoryPrim- STS GTSD v 2.2, sequence number 1300) is marked as one of the following:

(ICD-9, ICD-10)

Esophageal cancer, lower third(150.5, C15.5)

Esophageal cancer, middle third (150.4, C15.4)

Esophageal cancer, upper third (150.3, C15.3)

Malignant other part esophagus (150.8, C15.8)

Esophageal cancer, esophagogastric junction (cardia) (151.0, C16.0)

2. Primary procedure (Primary- STS GTSD v 2.2, sequence number 1500) is marked as one of the following:

Transhiatal-Total esophagectomy, without thoracotomy, with cervical esophagogastrostomy (43107)

Three hole-Total esophagectomy with thoracotomy; with cervical esophagogastrostomy (43112)

Ivor Lewis-Partial esophagectomy, distal two-thirds, with thoracotomy and separate abdominal incision (43117)

Thoracoabdominal-Partial esophagectomy, thoracoabdominal approach (43122)

Minimally invasive three hole esophagectomy (43XXX)

Minimally invasive esophagectomy, Ivor Lewis approach (43XXX)

Minimally invasive esophagectomy, Abdominal and neck approach (43XXX)

Total esophagectomy without thoracotomy; with colon interposition or small intestine reconstruction (43108)

Total esophagectomy with thoracotomy; with colon interposition or small intestine reconstruction (43113)

Partial esophagectomy, cervical, with free intestinal graft, including microvascular anastomosis (43116)

Partial esophagectomy, with thoracotomy and separate abdominal incision with colon interposition or small intestine (43118)

Partial esophagectomy, distal two-thirds, with thoracotomy only (43121)

Partial esophagectomy, thoracoabdominal with colon interposition or small intestine (43123)

Total or partial esophagectomy, without reconstruction with cervical esophagostomy (43124)

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

4. Gender and discharge mortality status information are provided; Gender (STS GTSD v 2.2, sequence number 190) is marked as “Male” or “Female, and discharge status (MtDCStat- STS GTSD v 2.2, sequence number 2200) is marked as “Alive” or “Dead”

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

**S.10. Denominator Exclusions** (Brief narrative description of exclusions from the target population)

None

**S.11. Denominator Exclusion Details** (All information required to identify and calculate exclusions from the denominator such as definitions, 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)

N/A

**S.12. Stratification Details/Variables** (All information required to stratify the measure results including the stratification variables, definitions, 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 with at S.2b)

N/A

**S.13. Risk Adjustment Type** (Select type. Provide specifications for risk stratification in S.12 and for statistical model in S.14-15)

Statistical risk model

If other:

**S.14. Identify the statistical risk model method and variables** (Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development and testing should be addressed with measure testing under Scientific Acceptability)

The model was developed by multivariate logistic regression. The details of risk adjustment model development were published in 2009:

Wright CD, Kucharczuk JC, O'Brien SM, Grab JD, Allen MS. Society of Thoracic Surgeons General Thoracic Surgery Database. Predictors of major morbidity and mortality after esophagectomy for esophageal cancer: a Society of Thoracic Surgeons General Thoracic Surgery Database risk adjustment model. J Thorac Cardiovasc Surg. 2009 Mar;137(3):587-95.

The following covariates are included in the esophagectomy Morbidity/Mortality model:

Variable	Sequence #	Definition
Age	170	
Gender	190	
African-American Race	210	
Zubrod Score	820	Modeled as a linear trend
ASA Class	1470	Modeled as a linear trend
Congestive Heart Failure	540	
Coronary Artery Disease	550	
Peripheral Vascular Disease	560	
Insulin-dependent Diabetes	640, 650	If "Yes" for Diabetes (640) and "Insulin" marked for Diabetes Control (650)
Hypertension	520	
Steroid Use	530	
Renal Dysfunction	680	
Cigarette Smoking (Ever)	730	
Body Mass Index	490, 500	Calculated using height and weight values – kg/m2. Modeled as a linear trend.
Preoperative Therapy	580, 600	If "Yes" for Preoperative chemotherapy (580) or "Yes" for Preoperative Thoracic Radiation Therapy (600)

**S.15. Detailed risk model specifications** (must be in attached data dictionary/code list Excel or csv file. Also indicate if available at measure-specific URL identified in S.1.)

Note: Risk model details (including coefficients, equations, codes with descriptors, definitions), should be provided on a separate worksheet in the suggested format in the Excel or csv file with data dictionary/code lists at S.2b.

Available in attached Excel or csv file at S.2b

**S.15a. Detailed risk model specifications** (if not provided in excel or csv file at S.2b)

**S.16. Type of score:**

Rate/proportion

If other:



**S.17. 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.18. Calculation Algorithm/Measure Logic** (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; aggregating data; risk adjustment; etc.)

Please refer to numerator and denominator sections for detailed information.

**S.19. Calculation Algorithm/Measure Logic Diagram URL or Attachment** (You also may provide a diagram of the Calculation Algorithm/Measure Logic described above at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

No diagram provided

**S.20. Sampling** (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF a PRO-PM, identify whether (and how) proxy responses are allowed.

N/A

**S.21. Survey/Patient-reported data** (If measure is based on a survey, provide instructions for conducting the survey and guidance on minimum response rate.)

IF a PRO-PM, specify calculation of response rates to be reported with performance measure results.

N/A

**S.22. Missing data** (specify how missing data are handled, e.g., imputation, delete case.)

Required for Composites and PRO-PMs.

To maximize use of available data, when encountering records with missing values of model covariates (with the exception of age and gender), the missing values were imputed. Patient records missing age or gender were excluded. Missing values of binary (yes/no) risk factors were conservatively imputed to the negative condition. Remaining variables were imputed to the median (BMI) or mode (race, Zubrod score, ASA class).

**S.23. Data Source** (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.24.

Registry Data

**S.24. Data Source or Collection Instrument** (Identify the specific data source/data collection instrument e.g. name of database, clinical registry, collection instrument, etc.)

IF a PRO-PM, identify the specific PROM(s); and standard methods, modes, and languages of administration.

STS General Thoracic Surgery Database (GTSD) Version 2.2; STS GTSD Version 2.3 went live on January 1, 2015.

**S.25. 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.26. Level of Analysis** (Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED)

Clinician : Group/Practice, Facility

**S.27. Care Setting** (Check ONLY the settings for which the measure is SPECIFIED AND TESTED)

Inpatient/Hospital

If other:

**S.28. COMPOSITE Performance Measure** - Additional Specifications (Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)

N/A

**2a. Reliability – See attached Measure Testing Submission Form**

**2b. Validity – See attached Measure Testing Submission Form**

[2.1\\_Testing\\_-\\_0460\\_MM\\_for\\_Esophagectomy\\_for\\_Cancer.4.5.16.docx](#), [2.1\\_Testing\\_-\\_0460\\_MM\\_for\\_Esophagectomy\\_for\\_Cancer.4.12.16.docx](#)

### 3. Feasibility

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

**3a. Byproduct of Care Processes**

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

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

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

If other:

**3b. Electronic Sources**

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

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

[Some data elements are in defined fields in electronic sources](#)

**3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.**

[The STS General Thoracic Surgery Database \(GTSD\) has more than 270 participants, and local availability of data elements in electronic format varies across institutions. Some institutions may have full EHR capability while others may have partial, or no availability. However, all data elements from participating institutions are submitted to the STS GTSD in an electronic format following a standard set of data specifications. STS GTSD participating institutions utilize data entry software products that are approved for the purposes of collecting and submitting STS GTSD data elements.](#)

**3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL.**

[No feasibility assessment](#) 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. Describe what you have learned/modified 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 a PRO-PM, consider implications for both individuals providing PROM data (patients, service recipients, respondents) and those whose performance is being measured.**

[The data elements included in this measure have been standard in the STS General Thoracic Surgery Database for at least 3 years and some of them have been part of the database for more than 15 years. The variables are considered to be data elements that are readily available and already collected as part of the process of providing care. Every 3 years, the STS GTSD undergoes a specification upgrade \(i.e., a process including surgeon leadership, staff, database managers, and programmers to review and update data fields and their respective definitions to ensure they reflect current practice\).](#)



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

**Data Collection:**

There are no direct costs to collect data for this measure. Costs to develop and maintain the measure include volunteer cardiothoracic surgeon leaders' time, STS staff time, and Duke Clinical Research Institute statistician and project management time.

**Other fees:**

STS General Thoracic Surgery Database participants (single surgeon or a group of surgeons) pay annual fees of \$550 per surgeon for STS members and \$700 per surgeon for non-STS members. In addition, there is a cost associated with purchasing data collection software which varies across vendors. STS GTSD participants have a separate agreement with their vendor, a process in which STS is not involved.

## 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.

Planned	Current Use (for current use provide URL)
Public Reporting	Quality Improvement (Internal to the specific organization) STS General Thoracic Surgery Database – 273 Participants <a href="http://www.sts.org/national-database/database-managers/general-thoracic-surgery-databas">http://www.sts.org/national-database/database-managers/general-thoracic-surgery-databas</a>

#### 4a.1. For each CURRENT use, checked above, provide:

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

Please see above.

#### 4a.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?)

In 2017, STS is planning to launch the general thoracic surgery component of STS Public Reporting Online. This is currently in the planning stage. STS Public Reporting Online: <http://www.sts.org/quality-research-patient-safety/sts-public-reporting-online>

The STS National Database is a Qualified Clinical Data Registry (QCDR). Prolonged length of stay is one of many measures that STS reports to CMS on behalf of consenting STS Adult Cardiac Surgery Database surgeons. For the STS General Thoracic Surgery Database (GTSD), physician quality reporting is in the planning stage. STS GTSD leaders and STS staff are reviewing general thoracic measures for inclusion in physician quality reporting. STS intends to include general thoracic measures in its 2017 QCDR self-nomination.

#### 4a.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.)

Please see 4a.2.

#### 4b. 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.

##### 4b.1. Progress on Improvement. (Not required for initial endorsement unless available.)

Performance results on this measure (current and over time) should be provided in 1b.2 and 1b.4. Discuss:

- Progress (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

Please see 1b.2 and 1b.4

The performance of each participant is calculated twice a year using an updated 3-year time window. The performance is compared to the average STS performance within the considered 3-year time window. These results are shared with all participants through a semiannual feedback report.

	Total	Midwest	Northeast	South	West	
# of participants	169 (100%)	35 (20.7%)	53 (31.4%)	54 (32.0%)	27 (16.0%)	
# of patients	4557 (100%)	1325 (29.1%)	1499 (32.9%)	1176 (25.8%)	557 (12.2%)	

4b.2. 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.

N/A

#### 4c. 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).

4c.1. Were any unintended negative consequences to individuals or populations identified during testing; OR has evidence of unintended negative consequences to individuals or populations been reported since implementation? If so, identify the negative unintended consequences and describe how benefits outweigh them or actions taken to mitigate them.

We are not aware of any negative unintended consequences.

### 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.

No

##### 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.

#### 5a. Harmonization

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 completely harmonized?**

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

N/A

#### **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:** [Appendix\\_-\\_0460\\_MM\\_for\\_Esophagectomy\\_for\\_Cancer.pdf](#)

## **Contact Information**

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

**Co.2 Point of Contact:** [Jane, Han, jhan@sts.org, 312-202-5856-](#)

**Co.3 Measure Developer if different from Measure Steward:** [The Society of Thoracic Surgeons](#)

**Co.4 Point of Contact:** [Jane, Han, jhan@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.**

- [David Shahian, MD – Chair, Quality Measurement Task Force; surgeon leader/clinical expert in adult cardiac surgery](#)
- [Gaetano Paone, MD – Chair, Task Force on Quality Initiatives \(TQI\); surgeon leader/clinical expert in adult cardiac surgery](#)
- [Benjamin Kozower, MD – Chair, General Thoracic Surgery Database Task Force; surgeon leader/clinical expert in general thoracic surgery](#)
- [William Burfeind, MD – Surgeon leader/clinical expert in general thoracic surgery](#)
- [Robert Welsh, MD – Surgeon leader/clinical expert in general thoracic surgery](#)
- [Jeffrey Jacobs, MD – Surgeon leader/clinical expert in congenital heart surgery](#)
- [Felix Fernandez, MD – Surgeon leader/clinical expert in general thoracic surgery](#)
- [Cameron Wright, MD – Surgeon leader/clinical expert in general thoracic surgery](#)
- [Max He, MS – Statistician](#)
- [Sean O'Brien, PhD – Statistician](#)
- [Andrzej Kosinski, PhD – Statistician](#)

- Jane Han, MSW – Staff, Senior Manager of Quality Metrics & Initiatives
- Donna McDonald, MPH, RN – Staff, Senior Manager of the STS National Database and Patient Safety

Members of the STS TQI and the GTSDTF provide clinical expertise as needed. The STS Workforce on National Database meets at the STS Annual Meeting and reviews measures on an annual basis.

**Measure Developer/Steward Updates and Ongoing Maintenance**

**Ad.2** Year the measure was first released: 2008

**Ad.3** Month and Year of most recent revision: 03, 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, 2017

**Ad.6** Copyright statement: N/A

**Ad.7** Disclaimers: N/A

**Ad.8** Additional Information/Comments: None