
CBE ID

2563

Title

STS Aortic Valve Replacement (AVR) + Coronary Artery Bypass Graft (CABG) Composite Score

Endorsement Status

Endorsement Removed

E&M Committee Rationale/Justification

No longer pursuing endorsement.

Is Under Review

No

Previous Endorsement Cycle

Fall 2018

Removal Date

Sun, 08/31/2025 - 11:38

Initial Endorsement

Fri, 11/07/2014 - 08:53

Steward

The Society of Thoracic Surgeons

1.0 New or Maintenance

Maintenance

1.1 Measure Structure

Composite Measure

1.3 Electronic Clinical Quality Measure (eCQM)

No

1.6 Measure Description

The STS AVR+CABG Composite Score comprises two domains consisting of six measures: Domain 1) Absence of Operative Mortality - Proportion of patients (risk-adjusted) who do not experience operative mortality. Operative mortality is defined as death during the same hospitalization as surgery or after discharge but within 30 days of the procedure; and Domain 2) Absence of Major Morbidity - Proportion of patients (risk-adjusted) who do not experience any major morbidity. Major morbidity is defined as having at least one of the following adverse outcomes: 1. reoperations for any cardiac reason, 2. renal failure, 3. deep sternal wound infection, 4. prolonged

ventilation/intubation, and 5. cerebrovascular accident/permanent stroke. All measures are based on audited clinical data collected in a prospective registry and are risk-adjusted.

Participants receive a score for each of the two domains, plus an overall composite score. The overall composite score was created by “rolling up” the domain scores into a single number. In addition to receiving a numeric score, participants are assigned to rating categories designated by one star (below average performance), two stars (average performance), or three stars (above average performance). Star ratings are publicly reported on the STS website.

1.8 Level of Analysis

Clinician: Group/Practice, Facility

1.14 Numerator

Due to the complex methodology used to construct the composite measure, it is impractical to separately discuss the numerator and denominator. The following discussion describes how each domain score is calculated and how these are combined into an overall composite score. The STS AVR+CABG Composite Score comprises two domains consisting of six individual measures:

1. Absence of Operative Mortality NQF # 0123 Risk-Adjusted Operative Mortality for AVR+CABG Surgery
2. Absence of Major Morbidity, scored any-or-none. The measures used are the same morbidity outcomes included in NQF #0696 STS CABG Composite Score.
- Risk-Adjusted Postoperative Stroke/Cerebrovascular Accident
- Risk-Adjusted Postoperative Surgical Re-exploration
- Risk-Adjusted Postoperative Deep Sternal Wound Infection Rate
- Risk-Adjusted Postoperative Renal Failure
- Risk-Adjusted Postoperative Prolonged Intubation (Ventilation)

Participants receive a score for each of the two domains, plus an overall composite score. The overall composite score is created by “rolling up” the domain scores into a single number. In addition to receiving a numeric score, participants are assigned to rating categories designated by one star (below average performance), two stars (average performance), or three stars (above average performance).

Patient Population: The analysis population consists of adult patients aged 18 years or older who undergo AVR+CABG surgery

Time Period: 3 years

Data Completeness Requirement: Participants are excluded from the analysis if they have fewer than 10 AVR+CABG procedures in the patient population.

Technical Details The unit of measurement for the STS AVR+CABG Composite Score can be either a participant (most often a cardiac surgical practice but occasionally an individual surgeon) or a hospital.

For the Absence of Operative Mortality domain, the NUMERATOR is: Number of patients undergoing AVR+CABG who survived until after discharge and >30 days post-surgery

For the Absence of Major Morbidity domain, the NUMERATOR is: Number of patients undergoing AVR+CABG who did not experience any of the five specified major morbidity endpoints

****Morbidity endpoints consist of postoperative stroke/cerebrovascular accident, surgical re-exploration, deep sternal wound infection, renal failure, prolonged intubation (ventilation).** Patients with documented history of renal failure (i.e., dialysis or baseline serum creatinine of 4.0 or higher) are excluded when counting renal failure outcomes.

STS AVR+CABG risk models are used to estimate expected rates of mortality and any-or-none morbidity (Reference: Shahian DM, O’Brien SM, Filardo G, Ferraris VA, et al. The Society of Thoracic Surgeons 2008 cardiac surgery risk models: part 3--valve plus coronary artery bypass grafting surgery. *Ann Thorac Surg* 2009 Jul;88(1 Suppl):S43-62.) To enhance interpretation, mortality rates are converted to survival rates (risk-standardized survival rate = 100 - risk-standardized mortality rate), and morbidity rates are converted to “absence of morbidity” rates

(risk-standardized absence of morbidity rate = $100 - \text{risk-standardized morbidity rate}$). Defining scores in this manner ensures that increasingly positive values reflect better performance, which is easier for consumers to interpret. (Please see the appendix for the formula used to calculate the overall composite score.) The method is equivalent to calculating a weighted average, with weights proportional to the inverse of the SD. In the most recent production of the STS AVR+CABG Composite Score based on data from July 2010 - June 2013, $w_{\text{mort}}=0.77$ and $w_{\text{morb}} = 0.23$. Star Rating: Star ratings are derived by testing whether the participant's composite or domain score is significantly different from the overall STS average. For instance, if for each of the 2 composite score domains, a participant's estimated score is lower than the overall STS average, but the difference between the participant and STS is not statistically significant, the ratings would each be 2 stars. If however, for the overall composite, the point estimate is lower than the STS average, AND this difference is statistically significant, the overall participant star rating is 1 star. The fact that statistical significance was achieved for the composite score but not the individual domains reflects the greater precision of the composite score compared to individual endpoints. This precision is achieved by aggregating information across multiple endpoints instead of a single endpoint. Additional details regarding the AVR+CABG Composite Score are provided in the manuscript: Shahian DM, He X, Jacobs JP, et al. The STS AVR + CABG Composite Score: A Report of the STS Quality Measurement Task Force. *Ann Thorac Surg* 2014;97(5),1604-9.

1.15 Denominator

Due to the complex methodology used to construct the composite measure, it is impractical to separately discuss the numerator and denominator. The following discussion describes how each domain score is calculated and how these are combined into an overall composite score. The STS AVR+CABG Composite Score comprises two domains consisting of six individual measures:

1. Absence of Operative Mortality NQF # 0123 Risk-Adjusted Operative Mortality for AVR+CABG Surgery
2. Absence of Major Morbidity, scored any-or-none. The measures used are the same morbidity outcomes included in NQF #0696 STS CABG Composite Score. Risk-Adjusted Postoperative Stroke/Cerebrovascular Accident Risk-Adjusted Postoperative Surgical Re-exploration Risk-Adjusted Postoperative Deep Sternal Wound Infection Rate Risk-Adjusted Postoperative Renal Failure Risk-Adjusted Postoperative Prolonged Intubation (Ventilation)

Participants receive a score for each of the two domains, plus an overall composite score. The overall composite score is created by "rolling up" the domain scores into a single number. In addition to receiving a numeric score, participants are assigned to rating categories designated by one star (below average performance), two stars (average performance), or three stars (above average performance).

Patient Population: The analysis population consists of adult patients aged 18 years or older who undergo AVR+CABG surgery

Time Period: 3 years

Data Completeness Requirement: Participants are excluded from the analysis if they have fewer than 10 AVR+CABG procedures in the patient population.

Technical Details The unit of measurement for the STS AVR+CABG Composite Score can be either a participant (most often a cardiac surgical practice but occasionally an individual surgeon) or a hospital. For the Absence of Operative Mortality domain AND the Absence of Major Morbidity domain, the DENOMINATOR is: Number of patients undergoing isolated AVR+CABG during the measurement period

STS AVR+CABG risk models are used to estimate expected rates of mortality and any-or-none morbidity (Reference: Shahian DM, O'Brien SM, Filardo G, Ferraris VA, et al. The Society of Thoracic Surgeons 2008 cardiac surgery risk models: part 3--valve plus coronary artery bypass grafting surgery. *Ann Thorac Surg* 2009 Jul;88(1 Suppl):S43-62.) To enhance interpretation, mortality rates are converted to survival rates (risk-standardized survival rate = $100 - \text{risk-standardized mortality}$)

rate), and morbidity rates are converted to “absence of morbidity” rates (risk-standardized absence of morbidity rate = $100 - \text{risk-standardized morbidity rate}$). Defining scores in this manner ensures that increasingly positive values reflect better performance, which is easier for consumers to interpret. (Please see the appendix for the formula used to calculate the overall composite score.) The method is equivalent to calculating a weighted average, with weights proportional to the inverse of the SD. In the most recent production of the STS AVR+CABG Composite Score based on data from July 2010 – June 2013, $w_{\text{mort}}=0.77$ and $w_{\text{morb}} = 0.23$. Star Rating: Star ratings are derived by testing whether the participant’s composite or domain score is significantly different from the overall STS average. For instance, if for each of the 2 composite score domains, a participant’s estimated score is lower than the overall STS average, but the difference between the participant and STS is not statistically significant, the ratings would each be 2 stars. If however, for the overall composite, the point estimate is lower than the STS average, AND this difference is statistically significant, the overall participant star rating is 1 star. The fact that statistical significance was achieved for the composite score but not the individual domains reflects the greater precision of the composite score compared to individual endpoints. This precision is achieved by aggregating information across multiple endpoints instead of a single endpoint. Additional details regarding the AVR+CABG Composite Score are provided in the manuscript: Shahian DM, He X, Jacobs JP, et al. The STS AVR + CABG Composite Score: A Report of the STS Quality Measurement Task Force. *Ann Thorac Surg* 2014;97(5),1604-9.

6.1.2 Current or Planned Use(s)

Public Reporting, Quality Improvement with Benchmarking (external benchmarking to multiple organizations), Quality Improvement (Internal to the specific organization)

6.1.3 Current Use(s)

Public Reporting, Quality Improvement with Benchmarking (external benchmarking to multiple organizations), Quality Improvement (Internal to the specific organization)

Exclusions

Please see S.6 above

Planned Use

Public Reporting

Risk Adjustment

Statistical risk model

Target Population

Elderly

Steward Organization

The Society of Thoracic Surgeons

Steward POC email

mantman@sts.org