CBE ID

2561

Title

STS Aortic Valve Replacement (AVR) 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 - 09:14

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

STS AVR 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 and are also currently reported on the Consumer Reports 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 Composite Score comprises two domains consisting of six individual measures:1. Absence of Operative MortalityNQF # 0120 Risk-Adjusted Operative Mortality for AVR2. 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 AccidentRisk-Adjusted Postoperative Surgical Re-explorationRisk-Adjusted Postoperative Deep Sternal Wound Infection RateRisk-Adjusted Postoperative Renal FailureRisk-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 isolated AVR surgeryTime Period: 3 yearsData Completeness Requirement: Participants are excluded from the analysis if they have fewer than 10 isolated AVR procedures in the patient population.Technical DetailsThe unit of measurement for the STS AVR 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 isolated AVR who survived until after discharge and >30 days post-surgeryFor the Absence of Major Morbidity domain, the NUMERATOR is:Number of patients undergoing isolated AVR who did not experience any of thefive 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 risk models are used to estimate expected rates of mortality and any-or-none morbidity (Reference: O’Brien SM, Shahian DM, Filardo G, et al. The Society of Thoracic Surgeons 2008 cardiac surgery risk models: part 2—isolated valve surgery. Ann Thorac Surg 2009;88(1 Suppl):S23–42). 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 – 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 Composite Score based on data from July 2010 – June 2013, wtmort=0.79 and wtmorb = 0.21.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 toindividual endpoints. This precision is achieved by aggregating information across multiple endpoints instead of a single endpoint.Additional details regarding the AVR Composite Score are provided in the attached manuscript:Shahian DM, He X, Jacobs JP, et al. The Society of Thoracic Surgeons Isolated Aortic Valve Replacement (AVR) Composite Score: a report of the STS Quality Measurement Task Force. Ann Thorac Surg 2012;94:2166-71.

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 Composite Score comprises two domains consisting of six individual measures:1. Absence of Operative MortalityNQF # 0120 Risk-Adjusted Operative Mortality for AVR2. 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 AccidentRisk-Adjusted Postoperative Surgical Re-explorationRisk-Adjusted Postoperative Deep Sternal Wound Infection RateRisk-Adjusted Postoperative Renal FailureRisk-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 isolated AVR surgeryTime Period: 3 yearsData Completeness Requirement: Participants are excluded from the analysis if they have fewer than 10 isolated AVR procedures in the patient population.Technical DetailsThe unit of measurement for the STS AVR 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 during the measurement periodSTS AVR risk models are used to estimate expected rates of mortality and any-or-none morbidity (Reference: O'Brien SM, Shahian DM, Filardo G, et al. The Society of Thoracic Surgeons 2008 cardiac surgery risk models: part 2—isolated valve surgery. Ann Thorac Surg 2009;88(1 Suppl):S23–42). To enhance interpretation, mortality rates are converted to survival rates (risk-standardized survival rate = 100 – risk-standardizedmortality rate), and morbidity rates are

converted to “absence of morbidity” rates (risk-standardized absence of morbidity rate =100 – 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 Composite Score based on data from July 2010 – June 2013, wtmort=0.79 and wtmorb = 0.21.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 toindividual endpoints. This precision is achieved by aggregating information across multiple endpoints instead of a single endpoint.Additional details regarding the AVR Composite Score are provided in the attached manuscript:Shahian DM, He X, Jacobs JP, et al. The Society of Thoracic Surgeons Isolated Aortic Valve Replacement (AVR) Composite Score: a report of the STS Quality Measurement Task Force. Ann Thorac Surg 2012;94:2166-71.

6.1.2 Current or Planned Use(s)

Public Reporting, Quality Improvement (Internal to the specific organization)

6.1.3 Current Use(s)

Public Reporting, Quality Improvement (Internal to the specific organization)

Exclusions

Please see S.6 above

Risk Adjustment

Statistical risk model

Target Population

Elderly

Steward Organization

The Society of Thoracic Surgeons

Steward POC email

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