

## Quality Measures Fact Sheet

### **Volume Weighted Aortic Valve Replacement and Aortic Valve Replacement + Coronary Artery Bypass Graft Composite Measures (NQF #2561 and #2563)**

*National Quality Strategy Domain: Making Care Safer by Reducing Harm*

*Quality Measures Set: Alternate*

*Data Source: Registry*

### **BPCI Advanced and Quality**

The Center for Medicare & Medicaid Innovation's (the CMS Innovation Center's) BPCI Advanced Model rewards health care providers for delivering services more efficiently, supports enhanced care coordination, and recognizes high quality care. Hospitals and clinicians should work collaboratively to achieve these goals, which have the potential to improve the BPCI Advanced Beneficiary experience and align to the CMS Quality Strategy goals of promoting effective communication and care coordination, highlighting best practices, and making care safer and more affordable. A goal of the BPCI Advanced Model is to promote seamless, patient-centered care throughout each Clinical Episode, regardless of who is responsible for a specific element of that care.

### **Background on Volume Weighted Aortic Valve Replacement and Aortic Valve Replacement + Coronary Artery Bypass Graft**

CMS expects more Medicare beneficiaries to undergo cardiac valve procedures as the population continues to age. Goals for pursuing aortic valve replacement (AVR) and coronary artery bypass graft (CABG) procedures include enhancing quality of life, reducing angina and other coronary heart disease (CHD) symptoms, preserving or restoring cardiac function, and improving survival. As with any surgery, there is risk of complication for patients who undergo AVR and CABG procedures and health care teams may reduce that risk if managed effectively. These cardiac surgery patients experience variable quality and outcomes, particularly within the elderly population where the incidence of mortality and adverse events is significantly higher. Studies have shown that adequate post-operative care heavily influences morbidity.<sup>78</sup>

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<sup>78</sup> Agarwal, S., Garg, A., Parashar, A., Svensson, L. G., Tuzcu, M., Navia, J. L., Mick, S., & Kapadia, S. R. (2015). In-hospital mortality and stroke after surgical aortic valve replacement: a nationwide perspective. *The Journal of Thoracic and Cardiovascular Surgery*, 150(3), 571-578. Retrieved from [https://www.itcvs.org/article/S0022-5223\(15\)00882-X/fulltext](https://www.itcvs.org/article/S0022-5223(15)00882-X/fulltext).

## CMS Innovation Center Rationale for Including the Volume Weighted AVR and AVR + CABG Composite Measures in BPCI Advanced

Through evidence-based, reliable and valid quality measurement, the CMS Innovation Center aims to measure performance and adjust payment based on the frequency of adverse outcomes. Average, risk-adjusted mortality rates for AVR and AVR + CABG procedures have continued to improve but evaluating provider performance in cardiac surgery based on a measure of mortality alone is suboptimal.<sup>79</sup> The CMS Innovation Center added the AVR and AVR + CABG Composite measures to the BPCI Advanced Model to provide a more complete perspective of quality by integrating six other post-operative adverse events across two domains.<sup>80</sup>

### Applicable Clinical Episodes

The AVR and AVR + CABG Composite measure is included in the Alternate Quality Measures Set and applies to the following inpatient Clinical Episode<sup>81</sup>:

- Cardiac Valve: Medicare Severity–Diagnosis-Related Groups (MS-DRG) 216, 217, 218, 219, 220, and 221

### Measure Specifications

The AVR and AVR + CABG Composite measures selected for BPCI Advanced follows the National Quality Forum (NQF) #2561 and #2563 measure specifications. Both the AVR and AVR + CABG measures include two domains consisting of a total of six data points:

- Domain 1 – Absence of Operative Mortality
- Domain 2 – Absence of Major Morbidity

The Society of Thoracic Surgeons (STS) National Database™ Adult Cardiac Surgery Database (ACSD) calculates a score for each of the two domains and then calculates an overall composite score by “rolling up” the two domain scores into a single number. The STS National Database™ ACSD will provide the CMS Innovation Center with a score for each of the two NQF measures (NQF #2561 and NQF #2563), along with a volume-weighted blend of the two scores at the hospital level for all patients included in the denominator.

The CMS Innovation Center will exclude BPCI Advanced Participants from the analysis if they have fewer than 25 AVR or AVR + CABG procedures in the patient population or if more than five percent of their data is missing on any of the five NQF-endorsed process measures detailed below.

The registry will calculate Acute Care Hospital (ACH) level performance for all patients included in the denominator. The term “patients” refers to people 18 years and older who undergo a procedure at the hospital associated with the Clinical Episodes from the “Applicable Clinical Episodes” section, not limited to Medicare beneficiaries or BPCI Advanced Beneficiaries. For Physician Group Practices (PGPs), the

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<sup>79</sup> AVR + CABG composite measure specifications. Retrieved from <http://www.qualityforum.org/QPS/2563>.

<sup>80</sup> Shahian, D., He, X., Jacobs, J. P., Rankin J. S., Welke, K. F., Filardo, G., Shewan, C. M., & O’Brien, S. M. (2012). The society of thoracic surgeons isolated aortic valve replacement composite score: a report of the STS quality measurement task force. *Annals of Thoracic Surgery*, 94, 2166-2171. Retrieved from [https://www.annalsthoracicsurgery.org/article/S0003-4975\(12\)02178-9/pdf](https://www.annalsthoracicsurgery.org/article/S0003-4975(12)02178-9/pdf).

<sup>81</sup> MS-DRGs are up to date as of Model Year 3 (2020) and will be updated for Model Year 4 as needed.

registry will calculate the measure as specified at individual hospitals and then the CMS Innovation Center will weight measure performance based on PGP Clinical Episode volume for each ACH where a PGP triggers an episode.

## Denominator

The denominator for the AVR or AVR + CABG measure includes all patients aged 18 years or older who undergo an AVR or AVR + CABG procedure in a non-federal hospital, regardless of payer status. This measure is not limited to Medicare beneficiaries or BPCI Advanced Beneficiaries. All MS-DRG triggers apply, but this measure only applies to patients with an AVR or an AVR + CABG procedure. The measure will include BPCI Advanced Participants in the analysis they have a minimum of 25 AVR or AVR + CABG procedures in the patient population.

## Numerator

The method for calculating each domain score and combining them into an overall composite score is detailed below. The STS National Database™ ACSD will provide the CMS Innovation Center with a score for the AVR or AVR + CABG Composite measures that is comprised of two domains consisting of six individual data points:

- Domain 1 – Absence of Operative Mortality
  - The numerator is the proportion of patients (risk-adjusted) who do not experience operative mortality, which the measure defines as death before hospital discharge or within 30 days of the operation
- Domain 2 – Absence of Major Morbidity
  - The numerator is the proportion of patients (risk-adjusted) who do not experience any major morbidity, which the measure defines as having at least one of the following adverse outcomes and the measure scores as “any” or “none.” The adverse outcomes used are the same morbidity outcomes included in NQF #0696 STS CABG Composite Score and are as follows:
    - postoperative stroke/cerebrovascular accident
    - postoperative surgical re-exploration
    - postoperative deep sternal wound infection rate
    - postoperative renal failure
    - postoperative prolonged intubation (ventilation)

## Measure Submission

BPCI Advanced Participants will submit this measure through the STS National Database™ ACSD.

## Revisions to the Published Specifications

The BPCI Advanced version of this measure is calculated using a three-year period of data. In Model Year 4, data from January 1, 2019 through December 31, 2021 will be used to calculate the measure.

## Composite Quality Score

The AVR and AVR + CABG Composite measures are one component of the BPCI Advanced Composite Quality Score (CQS) calculation. The CMS Innovation Center uses the CQS to adjust a portion of any Positive Total Reconciliation Amount and any Negative Total Reconciliation Amount. The CQS adjustment will not adjust the Positive Total Reconciliation Amount down by more than 10 percent, nor will it adjust the Negative Total Reconciliation Amount up by more than 10 percent. More information is available at the BPCI Advanced website provided below.

## Other Resources

Organization/Resource	Website Address
NQF #2561 specifications	<a href="http://www.qualityforum.org/QPS/2561">http://www.qualityforum.org/QPS/2561</a>
NQF #2563 specifications	<a href="http://www.qualityforum.org/QPS/2563">http://www.qualityforum.org/QPS/2563</a>
BPCI Advanced	<a href="https://innovation.cms.gov/initiatives/bpci-advanced">https://innovation.cms.gov/initiatives/bpci-advanced</a>
STS National Database™ ACSD registry specifications	<a href="https://www.sts.org/quality-safety/performance-measures/descriptions#AVRCABGComposite">https://www.sts.org/quality-safety/performance-measures/descriptions#AVRCABGComposite</a>