

**Quality ID #44 (NQF 0236): Coronary Artery Bypass Graft (CABG): Preoperative Beta-Blocker in Patients with Isolated CABG Surgery – National Quality Strategy Domain: Effective Clinical Care**

**2018 OPTIONS FOR INDIVIDUAL MEASURES:**  
**REGISTRY ONLY**

**MEASURE TYPE:**

Process

**DESCRIPTION:**

Percentage of isolated Coronary Artery Bypass Graft (CABG) surgeries for patients aged 18 years and older who received a beta-blocker within 24 hours prior to surgical incision

**INSTRUCTIONS:**

This measure is to be submitted **each time** an isolated CABG procedure is performed during the performance period. It is anticipated that eligible clinicians who provide services for isolated CABG will submit this measure. The timeframe for this measure includes the entire 24 hour period prior to the surgical incision time.

**Measure Submission:**

The listed denominator criteria is used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions allowed by the measure. The quality-data codes listed do not need to be submitted for registry submissions; however, these codes may be submitted for those registries that utilize claims data.

**DENOMINATOR:**

Isolated CABG surgeries for patients aged 18 years and older

**Definition:**

**Isolated CABG** – Refers to CABG using arterial and/or venous grafts only

***DENOMINATOR NOTE:*** *In order to ensure the only surgeries allowed into the denominator for the measure are isolated CABG surgeries, the anesthesiologist CPT code (00562) (which is not specific to isolated CABG), would need to be in conjunction with the CPT indicated for the CABG surgery (33530) and one of the other CABG codes (33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33533, 33534, 33535, 33536).*

**Denominator Criteria (Eligible Cases):**

Patients aged  $\geq 18$  years on date of encounter

**AND**

**Patient procedure during the performance period (CPT):** 00566, 00567, 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33533, 33534, 33535, 33536

**OR**

**Patient procedure during the performance period (CPT):** 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33533, 33534, 33535, 33536

**AND**

**Patient procedure during the performance period (CPT):** 00562, 33530

**NUMERATOR:**

Patients who received a beta-blocker within 24 hours prior to surgical incision of isolated CABG surgeries

**Definition:**

**Medical Reason** – Eligible clinician must document specific reason(s) for not administering beta- blockers

**NUMERATOR NOTE:** *Denominator Exception(s) are determined on the date of the denominator eligible encounter.*

**Numerator Options:**

***Performance Met:***

Beta blocker administered within 24 hours prior to surgical incision **(4115F)**

**OR**

***Denominator Exception:***

Documentation of medical reason(s) for not administering beta blocker within 24 hours prior to surgical incision (e.g., not indicated, contraindicated, other medical reason) **(4115F with 1P)**

**OR**

***Performance Not Met:***

Beta blocker not administered within 24 hours prior to surgical incision, reason not otherwise specified **(4115F with 8P)**

**RATIONALE:**

“Despite significant developments in PCI, CABG remains the most commonly used treatment option for patients with complex CAD and high-risk patients” (El Bardissi et al., 2012, p.274).

Postoperative atrial fibrillation (POAF) is a common complication following cardiac surgery, occurring in 25-40% of patients (Crystal, 2004, Burgess, 2006). POAF has been associated with increased rates of post-operative morbidity such as cerebrovascular accidents (CVA), infections (e.g. septicemia, pneumonia, and mediastinitis, renal failure and mortality and consequently, increased costs (Mariscalco, 2008, Crystal, 2004, Bramer, 2010).

“Postoperative AF after cardiac operations is associated with postoperative morbidities such as cerebrovascular accidents (CVA), infections (e.g., septicemia, pneumonia and mediastinitis), and renal failure. Previous studies have suggested that POAF after CABG is related to early and late mortality” (Bramer et al., 2010, p.443). “Development of AF immediately after coronary artery bypass surgery (CABG) results in a longer stay in the intensive care unit and in hospital, together with a significantly higher (two-to three-fold) risk of post-operative stroke” (Burgess et al., 2006, p.2846).

Prophylactic administration of beta-blockers has been shown to reduce the risk of POAF and mortality following isolated coronary artery bypass graft surgery (Connolly, 2003, Mariscalco, 2008, Ferguson, 2002). Khan’s meta-analysis of RCTs (2013) found that “Preoperative BB prophylaxis initiation resulted in 51% reduction in the incidence of AF as compared to controls, however these results were not statistically significant” (p.62-63

"According to our findings, perioperative application of beta-blockers still plays a pivotal role in cardiac surgery, as they can substantially reduce the high burden of supraventricular and ventricular arrhythmias in the aftermath of surgery. Their influence on mortality, AMI, stroke, congestive heart failure, hypotension and bradycardia in this setting remains unclear” (Blessberger et al., 2014, p.3).Recent studies (Kohsaka et al. 2016, Brinkman et al. 2014) researched the use of preoperative  $\beta$ -blockers and concluded the use of  $\beta$ -blockers did not improve outcomes.

The Brinkman study concluded “Preoperative  $\beta$ -blocker use among patients undergoing nonemergent CABG surgery who have not had a recent myocardial infarction was not associated with improved perioperative outcomes” (p.1320).

The Kohsaka research concluded “in a propensity-matched, balanced cohort of CABG patients, the use of  $\beta$ -blockers was not associated with decreased mortality or in-hospital complications, regardless of the patient’s preoperative risk profile. The present findings suggest that preoperative  $\beta$ -blocker use in patients undergoing CABG is not associated with improved short-term outcomes”(p.53).

A scientific statement by the AHA in 2015 continues to support the use of perioperative  $\beta$ -blockers in patients undergoing CABG surgery. See Clinical Recommendation Statements for recommendation and grade.

### **CLINICAL RECOMMENDATION STATEMENTS:**

Secondary Prevention After Coronary Artery Bypass Graft Surgery: A Scientific Statement From the American Heart Association (2015)

$\beta$ -Blocker Therapy Recommendations

1. All CABG patients should be prescribed perioperative  $\beta$ -blocker therapy to prevent postoperative AF, ideally starting before surgery, unless contraindicated (ie, bradycardia, severe reactive airway disease)(*Class I; Level of Evidence A*).

Preoperative Beta-blockers (ACCF/AHA, 2011):

Class I

- 1) “Beta-blockers should be administered for at least 24 hours before CABG to all patients without contraindications to reduce the incidence or clinical sequelae of postoperative AF.” (Level of Evidence: B), (ACCF/AHA, 2011, p.e152)

Class IIa

- 1) “Preoperative use of beta-blockers in patients without contraindications, particularly in those with an LV ejection fraction (LVEF) greater than 30%, can be effective in reducing the risk of in-hospital mortality.” (Level of Evidence: B), (ACCF/AHA, 2011, p.e152)
- 2) “Beta-blockers can be effective in reducing the incidence of perioperative myocardial ischemia.” (Level of Evidence: B), (ACCF/AHA, 2011, p.e152)

Class IIb

- 1) “The effectiveness of preoperative beta-blockers in reducing in-hospital mortality rate in patients with LVEF less than 30% is uncertain.” (Level of Evidence: B), (ACCF/AHA, 2011, p.e152)

Treatment of arrhythmias after revascularization (ESC/EACTS, 2014)

Class I

- 1) “Beta-blockers are recommended to decrease the incidence of atrial fibrillation after CABG in the absence of contraindications.” (Level of Evidence: A), (ESC/EACTS, 2014, p.146)

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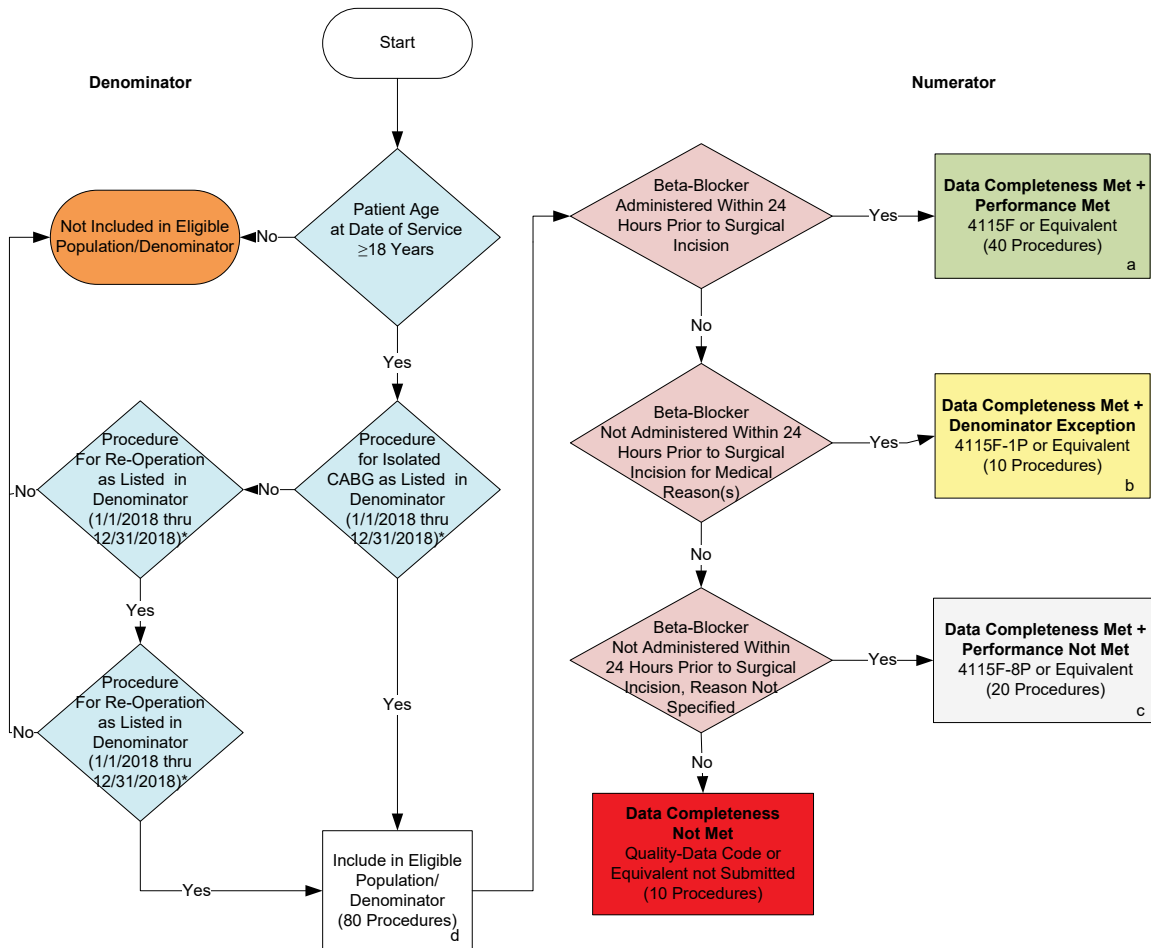
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**2018 Registry Flow for Quality ID #44 NQF #0236:  
Coronary Artery Bypass Graft (CABG): Preoperative Beta-Blocker in Patients with Isolated CABG Surgery**



**SAMPLE CALCULATIONS:**

**Data Completeness=**  

$$\frac{\text{Performance Met (a=40 procedures)} + \text{Denominator Exception (b=10 procedures)} + \text{Performance Not Met (c=20 procedures)}}{\text{Eligible Population / Denominator (d=80 procedures)}} = \frac{70 \text{ procedures}}{80 \text{ procedures}} = 87.50\%$$

**Performance Rate=**  

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (70 procedures) – Denominator Exception (b=10 procedure)}} = \frac{40 \text{ procedures}}{60 \text{ procedures}} = 66.67\%$$

\*See the posted Measure Specification for specific coding and instructions to submit this measure.  
 NOTE: Submission Frequency - Procedure

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 The measure diagrams were developed by CMS as a supplemental resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.

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## 2018 Registry Flow for Quality ID

### #44 NQF #0236: Coronary Artery Bypass Graft (CABG): Preoperative Beta-Blocker in Patients with Isolated CABG Surgery

Please refer to the specific section of the Specification to identify the denominator and numerator information for use in submitting this Individual Specification. This flow is for registry data submission.

1. Start with Denominator
2. Check Patient Age:
  - a. If Age greater than or equal to 18 years of age on Date of Service equals No during the Performance Period, do not include in Eligible Patient Population. Stop Processing.
  - b. If Age greater than or equal to 18 years of age on Date of Service equals Yes during the Performance Period, proceed to check Encounter for New CABG as Listed in the Denominator.
3. Check Encounter for Isolated CABG as Listed in the Denominator:
  - a. If Encounter for Isolated CABG as Listed in the Denominator equals No, proceed to check Encounter for Re-Operation as Listed in the Denominator.
  - b. If Encounter for Isolated CABG as Listed in the Denominator CABG equals Yes, proceed to include in Eligible Population.
4. Check Encounter for Re-Operation as Listed in the Denominator:
  - a. If Encounter for Re-Operation as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
  - b. If Encounter for Re-Operation as Listed in the Denominator equals Yes, proceed to check Encounter Code as Listed in the Denominator.
5. Check Encounter Code as Listed in the Denominator:
  - a. If Encounter Code as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
  - b. If Encounter Code as Listed in the Denominator equals Yes, proceed to include in Eligible Population.
6. Denominator Population:
  - a. Denominator population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 procedures in the Sample Calculation.
7. Start Numerator
8. Check Beta-Blocker Administered Within 24 Hours Prior to Surgical Incision:
  - a. If Beta-Blocker Administered Within 24 Hours Prior to Surgical Incision equals Yes, include in Data Completeness Met and Performance Met.
  - b. Data Completeness Met and Performance Met letter is represented as Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 40 procedures in the Sample Calculation.

- c. If Beta-Blocker Administered Within 24 Hours Prior to Surgical Incision equals No, proceed to check Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision for Medical Reasons.
9. Check Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision for Medical Reasons:
- a. If Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision for Medical Reasons equals Yes, include in Data Completeness Met and Denominator Exception.
  - b. Data Completeness Met and Denominator Exception is represented as Data Completeness in the Sample Calculation listed at the end of this document. Letter b equals 10 procedure in the Sample Calculation.
  - c. If Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision for Medical Reasons equals No, proceed to check Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision, Reason Not Specified.
10. Check Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision, Reason Not Specified:
- a. If Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision, Reason Not Specified equals Yes, include in the Data Completeness Met and Performance Not Met.
  - b. Data Completeness Met and Performance Not Met letter is represented as Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 20 procedures in the Sample Calculation.
  - c. If Beta-Blocker Not Administered Within 24 Hours Prior to Surgical Incision, Reason Not Specified equals No, proceed to Data Completeness Not Met.
11. Check Data Completeness Not Met:
- a. If Data Completeness Not Met equals No, Quality Data Code or equivalent not submitted. 10 procedures have been subtracted from the Data Completeness Numerator in the Sample Calculation.

**SAMPLE CALCULATIONS:**

**Data Completeness=**  

$$\frac{\text{Performance Met (a=40 procedures)} + \text{Denominator Exception (b=10 procedures)} + \text{Performance Not Met (c=20 procedures)}}{\text{Eligible Population / Denominator (d=80 procedures)}} = \frac{70 \text{ procedures}}{80 \text{ procedures}} = 87.50\%$$

**Performance Rate=**  

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (70 procedures) – Denominator Exception (b=10 procedure)}} = \frac{40 \text{ procedures}}{60 \text{ procedures}} = 66.67\%$$