

Measure Abbreviation: CARD 01

**Description:** Percentage of cases without elevated Troponin I levels (>1.00) postoperatively.

NQS Domain: Effective Clinical Care

Measure Type: Outcome

**Scope:** Calculated on a per case basis.

**Measure Summary:** CARD 01 is an outcome measure that identifies patients that had elevated troponin levels (Troponin I > 1.00) within 72 hours postoperatively. Troponin I levels are accurate markers of myocardial infarction.

**Rationale:** Postoperative myocardial infarction within 72 hours (as defined by a Troponin I level >3.6 times the 99<sup>th</sup> percentile upper reference limit, usually no greater than 1.00 ng/mL)<sup>1,2</sup> is associated with a significantly increased risk of 30-day mortality. Furthermore, any amount of postoperative myocardial injury (as defined by a Troponin I level > 0.03 ng/mL) is an independent predictor of 30-day mortality.<sup>3</sup> Preventing myocardial infarction is an important anesthetic goal.

Inclusions: All anesthetic cases.

### **Exclusions:**

- ASA 5 and 6 cases.
- Outpatient cases.
- Troponin I > 0.01 within 42 days prior to anesthesia start.\*
- Pacemaker insertions (CPT: 00530)
- Cardiac Ablation (CPT: 00537)
- Cardiac surgery without pump (CPT: 00560)
- Cardiac surgery with pump and <1 year old (CPT: 00561)
- Cardiac surgery with pump and > 1 year old (CPT: 00562)
- Cardiac surgery with hypothermic arrest (CPT: 00563)
- CABG without pump (CPT: 00566)
- CABG with pump (CPT: 00567)
- Heart Transplant (CPT: 00580)
- Testing of cardioversion or defibrillator functions (CPT: 00534)

Additional exclusion for Qualified Clinical Data Registry (QCDR) participants: Cases without a measured troponin will be excluded.

\*Rationale for excluding patient with troponin elevation within 42 days prior to date of surgery is based upon ACC/AHA guidelines recommending a delay in elective surgery for 6 weeks following myocardial infarction.<sup>4</sup>

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## **MPOG Concept IDs Required:**

| 5011 Formal lab- Troponin |
|---------------------------|
|---------------------------|

### Data Diagnostics Affected:

- Percentage of Cases with Postoperative Troponin (Postoperative Troponin)
- Percentage of Cases with Professional Fee Procedure Codes (Pro Fee Procedures)
- Percentage of CPT Codes from Anesthesia Professional Fee Billing that are actually Anesthesia Codes (Anesthesia Codes)
- Percentage of Cases with a Meaningful Admission Type Mapping (Admission Type Mapping)
- Percentage of Cases with ASA Status (Cases with ASA Status)

### **Collations Used:**

- AnesthesiaStart
- AnesthesiaEnd
- ASA5or6
- BP01

### Failed Case Review Grid:

- Link to Case
- Date of Service
- Procedure
- Surgical Service
- Operating Room
- Troponin Max Value
- Troponin Lab Time
- Case Duration (min)
- Has Anesthesia CPT
- Responsible Provider
- MPOG Case ID

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### **Case Viewer Template:**

| g, 160 cm<br>slon Type: Admit<br>ting Room:   | University<br>Procedure Transform<br>Anes Duration<br>Procedure: EP PREMATURE VENTR<br>Diagnosis: PVC, Ventricular prematur |       |        | LI<br>I A NORMAL HEAR | т     |       |     | MPOG Ca<br>MPOG Pa<br>AIMS Cas<br>AIMS Pati | tient I<br>e ID: |       |  |
|---|---|-------|--------|-----------------------|-------|-------|-----|---|------------------|-------|--|
| Note  | Cardiovascular  |       |        |                       |       |       |     |   |                  |       |  |
| atient in Facility  |   |       |        |                       |       |       |     |   |                  |       |  |
| Room Ready  | > Ventilator  |       |        |                       |       |       |     |   |                  |       |  |
| Anesthesia Machine Checked  | > Neuromuscular blockade  |       |        |                       |       |       |     |   |                  |       |  |
| Equipment verified  | Filedromuscular blockade  |       |        |                       |       |       |     |   |                  |       |  |
| New Site - Left Hand 20 g using 1 attempt(s).   | > Glucose management  |       |        |                       |       |       |     |   |                  |       |  |
| Patient identified, chart reviewed, status unchanged from<br>reoperative evaluation   | > Medications   |       |        |                       |       |       |     |   |                  |       |  |
| IPO status confirmed to be Solids > 8 hours and clear liquids > 3<br>ours   | > Fluids  |       |        |                       |       |       |     |   |                  |       |  |
| IIBP Cuff placed on R upper arm   | ✓ Labs  |       |        |                       |       |       |     |   |                  |       |  |
| Pre-Anesthesia evaluation completed and discussed with<br>Attending   |   |       | ĄS P.R |                       |       |       |     |   |                  |       |  |
| nesthesia Start   | Activated Clotting Time   |       |        |                       | 202   | 192   | 199 | 241   | 270              | 234   |  |
| atient positioned Supine  | Blood gas-HCO3  |       |        |                       |       |       |     |   | 11               |       |  |
| atient's arms placed by side on padded arm board, soft wrist  | Blood Urea Nitrogen, Se<br>Calcium (Total), Serum/  |       |        |                       |       |       |     |   | 7.9              |       |  |
| estraints applied per EP RN   | Chloride, Serum/Plasma  |       |        |                       |       |       |     |   | 1114             |       |  |
| atient In Room  | Creatinine, Serum/Plasma  |       |        |                       |       |       |     |   | 0.68             |       |  |
| ed not turned   | Glucose, Serum/Plasma   |       |        |                       |       |       |     |   | 92               |       |  |
| PRIOR to Induction/initiation of Anesthesia a VERIFICATION was<br>conducted with active participation of Anes, OR Nursing, Surgery<br>verifying correct patient, DOB, procedure, site, side, position,<br>antibiotics, DVT prophylaxis & implant, images, special equip | Magnesium, Serum/Plasma   |       |        |                       |       |       |     |   | 1.7              |       |  |
|   | Potasium, Serum/Plasma  |       |        |                       |       |       |     |   | 3.6              |       |  |
|   | Sodium, Serum/Plasma  |       | 1 L    |                       |       |       |     |   | 148              |       |  |
| IO Limin O2 administered by Ease Mark   | 07:00   | 08:00 | 09:00  | 10:00                 | 11:00 | 12:00 |     | 13:00                                       | 14:00            | 15:00 |  |

### **Other Measure Build Details:**

If another case starts within 72 hours, then the time window ends at anesthesia start of the subsequent case.

#### Success:

- Troponin I  $\leq$  1.00 within 72 hours of anesthesia end.
  - OR
- No troponin is measured.\*

\*Not success criteria for QCDR participants- see additional exclusion criteria.

### Threshold: 95%.

**Responsible Provider:** Providers assigned to patient longest duration of case unless there are providers who failed BP 01 during case. In that case, BP 01 failure takes precedence over longest duration.

### Method for determining Responsible Provider:

- 1) Provider(s) who failed BP 01. If not applicable,
- 2) Provider(s) signed into the case for the longest duration.

### Risk Adjustment (for outcome measures):

To evaluate provider-level risk adjustment we will calculate the observed to expected outcomes ratio (O/E). The O/E is calculated using a logistic regression model and predicts (given a set list of dependent patient and hospital level variables) the expected probability of having an elevated Troponin I level. We adjust for surgery risk score, emergent procedures, ASA, gender, age, body mass index, laboratory values, and teaching versus private hospital. Patient specific comorbidities are evaluated as well.

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# **References:**

- 1. Thygesen K, Alpert JS, Jaffe AS, Simoons ML, Chaitman BR, White HD. Third universal definition of myocardial infarction. *Global Heart*. 2012;7(4):275-295.
- 2. Devereaux PJ, Xavier D, Pogue J, et al. Characteristics and short-term prognosis of perioperative myocardial infarction in patients undergoing noncardiac surgery: a cohort study. Annals of internal medicine. 2011;154(8):523-528.
- 3. Botto F, Alonso-Coello P, Chan MT, et al. Myocardial injury after noncardiac surgery: a large, international, prospective cohort study establishing diagnostic criteria, characteristics, predictors, and 30-day outcomes. *Anesthesiology.* 2014;120(3):564-578.
- Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery. *Journal of nuclear cardiology: official publication of the American Society of Nuclear Cardiology.* 2015;22(1):162-215.