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 99th percentile upper reference limit, usually no greater than 1.00 ng/mL)[1,2] 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.[3] 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.[4]

MPOG Concept IDs Required:

Troponin MPOG Concept ID	
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)

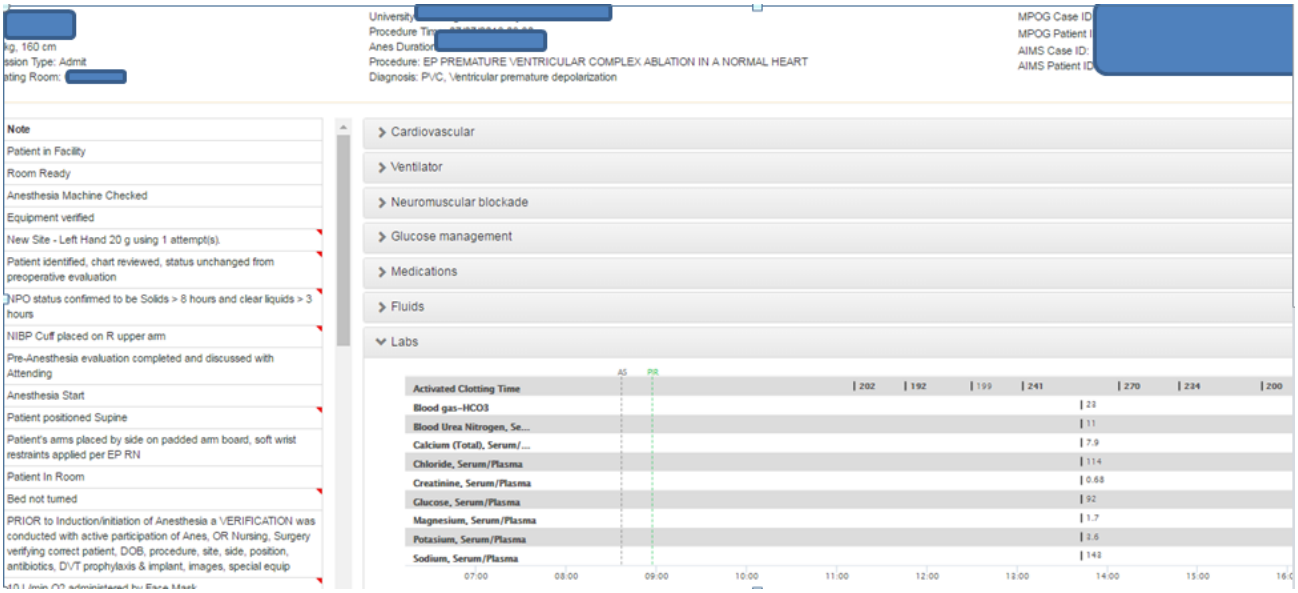
Collations Used:

- 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

Case Viewer Template:



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 ≤ 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.

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.
4. 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.