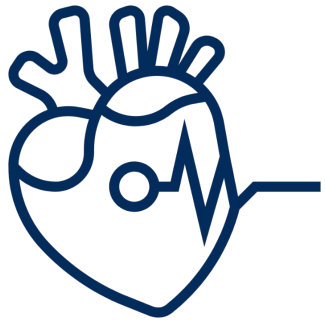
MPOG Cardiac Anesthesia Subcommittee Meeting
April 5, 2023

Agenda

- Welcome & announcements
- Discussion of upcoming cardiac-focused measure reviews
- Glucose management measure (GLU-06)
  - Preliminary data
  - “Finalization” of the specification
  - Discuss need for additional hyperglycemia avoidance measures
- Discussion of hypoglycemia avoidance counter measure options
- Summary and next steps



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Introductions

- **ASPIRE Quality Team**
  - **Allison Janda, MD** – MPOG Cardiac Anesthesia Subcommittee Lead
  - **Michael Mathis, MD** – MPOG Director of Research
  - **Kate Buehler, MS, RN** – Clinical Program Manager

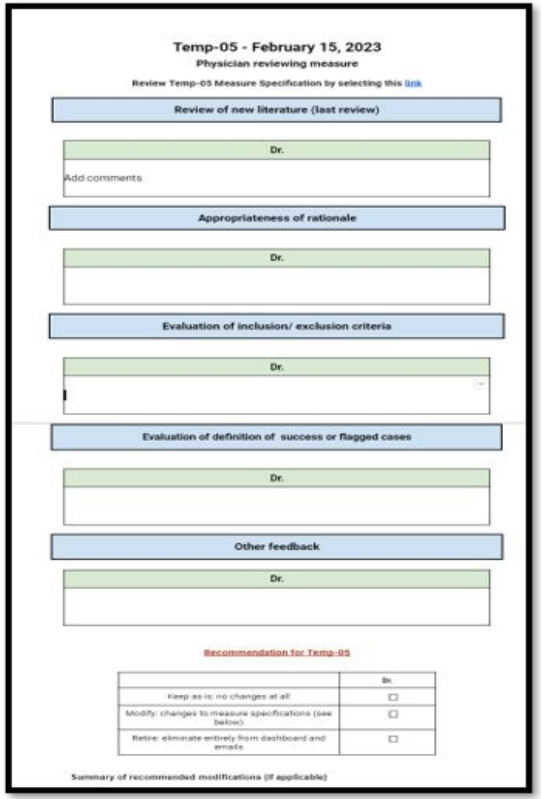
- Cardiac Anesthesiology Representatives joining us from around the US!

Upcoming Cardiac-Focused Measure Reviews

Upcoming Cardiac-Focused Measure Reviews

- FLUID-01-C review in July 2023
  - We are seeking one or two volunteers from different institutions, to review this measure and associated colloid use literature
    - Commitment:
      - Present literature and suggestions at the July Quality Committee meeting
      - Reviewers name will be listed on the Measure Spec
      - Template form

- TEMP-06-C & TEMP-07-C reviews in January 2025



Temp-05 - February 15, 2023

Physician reviewing measure

Review Temp-05 Measure Specification by selecting this link

Review of new literature (last review)

Dr.

Add comments

Appropriateness of rationale

Dr.

Evaluation of inclusion/ exclusion criteria

Dr.

Evaluation of definition of success or flagged cases

Dr.

Other feedback

Dr.

Recommendation for Temp-05

	Dr.
Keep as is: no changes at all	☐
Modify: changes to measure specifications (see below)	☐
Retire: eliminate entirely from dashboard and emails	☐

Summary of recommended modifications (if applicable)

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Upcoming Cardiac-Focused Measure Reviews

- FLUID-01-C: Minimizing Colloid Use (Cardiac)
  - Definition: Percentage of cardiac cases in which colloids were not administered intraoperatively
  - Rationale: Lack of consistent evidence to suggest improved survival with the use of colloids as compared to crystalloids in the surgical population. Because colloids are more expensive than crystalloids, it is recommended that anesthesia providers avoid the use of colloids in most instances.

GLU-06 Discussion and Preliminary Data

Cardiac Hyperglycemia Avoidance Measure

- **GLU-06:**
  - Percentage of patients, ≥18 years age, who undergo open cardiac surgical procedures under general anesthesia of 120 minutes case duration or longer for whom any blood glucose measure did not exceed 180 mg/dL (and not rechecked within 30-minutes and found to be </=180 mg/dL) was documented.
    - Note: open cardiac cases without ANY glucose values documented are flagged
- **Timing:**
  - Start: Anesthesia Start
  - End: Anesthesia End

Cardiac Hyperglycemia Avoidance Measure

- **Concepts Queried:**

Glucose MPOG Concept IDs	
3361	POC- Glucose (Fingerstick)
3362	POC- Glucose (Unspecified Source)
3405	POC- Blood Gas - Glucose
5003	Formal Lab-Glucose, Serum/Plasma
5036	Formal Lab-Blood Gas, Glucose

- **Attribution:**
  - The provider signed in at the first blood glucose of >180mg/dL.
  - In the event that two or more providers in the same role are signed in, both will receive the feedback.

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Cardiac Hyperglycemia Avoidance Measure

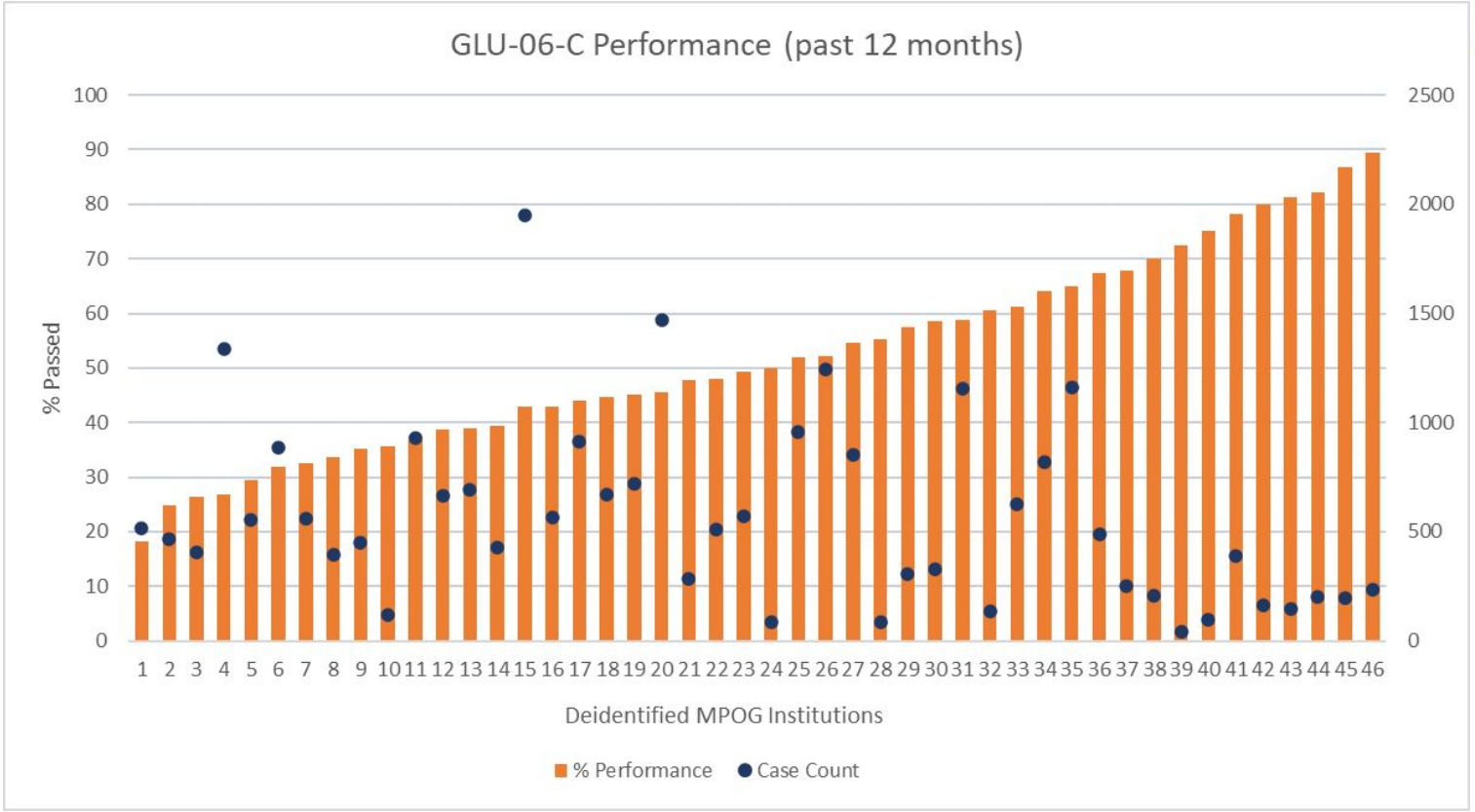
- **Inclusions:**
  - All patients, 18 years of age or older, both with and without diabetes, who undergo open cardiac surgical procedures (as determined by Procedure Type: Cardiac phenotype) under general anesthesia of 120 minutes duration or longer.
- **Exclusions:**
  - ASA 6
  - Organ harvest (CPT: 01990)
  - Non-cardiac cases as defined as those cases not meeting criteria for the cardiac case type phenotype
  - Within the general cardiac case type phenotype, exclude: Transcatheter/Endovascular, EP/Cath groups and Other Cardiac
  - Cases with age <18

Considerations

- Evaluate each high glucose between anesthesia start and end:
  - Blood glucose >180mg/dL is rechecked within 30 minutes and found to be >180mg/dL = flagged.
  - Blood glucose >180 mg/dL is not rechecked within 30 minutes = flagged.
  - Any case with a glucose >180mg/dL that was rechecked within 30 minutes and found to be </=180mg/dL = pass.
  - If no high glucose values > 180 mg/dL are documented between anesthesia start and end = passed.
  - If no blood glucose values are documented for a case = flagged.

- If two blood glucose levels are documented in the same minute, the lower blood glucose will be considered for this measure

Cardiac Hyperglycemia Avoidance Measure



Cardiac Hyperglycemia Avoidance Measure

- **Limitations:**
  - Any glucose checks not entered into the EHR will not be captured

- **Remaining Questions:**
  - Follow-up measure with a caveat for insulin treatment within a specific time window?

Hypoglycemia Avoidance Counter Measure

- **Purpose:**
  - To ensure this measure is not inducing an increase in **hypo**glycemia
- Options:
  - Also present GLU-02 on the cardiac dashboard
    - GLU-02: % of cases with intraoperative glucose < 60 with administration of dextrose containing solution or glucose recheck within 90 minutes of original glucose measurement
  - Develop a new measure to remove the treatment component and just flag cases with hypoglycemia

Progress and Next Steps

- Build 1 cardiac-specific measure in 2021 (completed, published 12/2021)
  - Post-bypass **hypo**thermia avoidance
- Build 1 cardiac-specific measure in early 2022 (completed, published 11/2022)
  - On-bypass **hyper**thermia avoidance
- Plan and build next measure in mid-2022 and publish in early 2023 (nearly done!)
  - Glucose management
- Next measure?

Next Measure Discussion:

- Previous suggested topics include:
  - Antibiotic selection and timing
  - Neuromuscular blockade reversal
  - Pulmonary complication avoidance
  - Hypotension avoidance
  - Acute kidney injury avoidance
  - Handoffs
  - Transfusion
  - Other ideas?

Cardiac Anesthesia Subcommittee Membership

- Open to all anesthesiologists or those interested in improving cardiothoracic measures
  - Do not have to practice at an active MPOG institution

- Proposed 2023 Meeting Schedule
  - April 2023
  - August 2023
  - November or December 2023

- Thank you for using the forum for discussion between meetings

Thank you!

Allison Janda, MD
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Subcommittee Chair
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Glucose Measure Literature/Guidelines:

- In a study of 510 patients undergoing cardiovascular surgery and found the incidence of AKI to be higher in patients with high HbA1c levels **preoperatively**; Every 1% increase over 6% in HgA1c levels increased the risk of renal complications by 24% [1]
- Glycemic variability, a standard deviation of all POC-BG readings, is associated with increased postoperative LOS-ICU, rise in creatinine, and AKI [2]
- A study including 761 cardiac surgery patients and found that diabetics were at increased risk of infection and glucose control (120-160 mg/dL) reduced the risk of wound infection in diabetics [3]
- In a randomized controlled trial, moderate glucose control defined as 127-179 mg/dl was found to be preferable to tight control ≤ 126 in patients undergoing CABG [4]

Glucose Measure Literature/Guidelines Continued:

- Incidence of AKI was higher in patients with time-weighted average intraop glucose of >150mg/dl (8%) as compared to patients with blood glucose 110-150 mg/dl (3%) [5]
- KDIGO - recommends maintaining blood glucose between 110 - 149 mg/dL in critically ill patients [6]
- Tight glucose control (<150mg/dl) is seen as controversial as risks of hypoglycemia are significant: NICE-SUGAR meta-analysis [7]
- Society of Thoracic Surgeons (STS) Practice Guidelines recommend **maintaining serum glucose levels ≤ 180 mg/dL for at least 24 hours after cardiac surgery** [8]
- Guidelines for Perioperative Care in Cardiac Surgery from the Enhanced Recovery After Surgery Society **recommends treatment of blood glucose >160-180mg/dL with an insulin infusion** [9]

References

1. Gumus F, Polat A, Sinikoglu SN, Yektas A, Erkalp K, Alagol A: Use of a lower cut-off value for HbA1c to predict postoperative renal complication risk in patients undergoing coronary artery bypass grafting. J Cardiothorac Vasc Anesth 2013; 27:1167–73

2. Bansal B, Carvalho P, Mehta Y, Yadav J, Sharma P, Mithal A, Trehan N: Prognostic significance of glycemic variability after cardiac surgery. J Diabetes Complications 2016; 30:613–7

3. Hruska LA, Smith JM, Hendy MP, Fritz VL, McAdams S. Continuous insulin infusion reduces infectious complications in diabetics following coronary surgery. Journal of cardiac surgery. 2005;20(5):403-407.

4. Bhamidipati CM, LaPar DJ, Stukenborg GJ, Morrison CC, Kern JA, Kron IL, Ailawadi G: Superiority of moderate control of hyperglycemia to tight control in patients undergoing coronary artery bypass grafting. J Thorac Cardiovasc Surg 2011; 141:543–51

5. Song JW, Shim JK, Yoo KJ, Oh SY, Kwak YL: Impact of intraoperative hyperglycaemia on renal dysfunction after off-pump coronary artery bypass. Interact Cardiovasc Thorac Surg 2013; 17:473–8

References

6. KDIGO. 2012. “KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease.” https://kdigo.org/wp-content/uploads/2017/02/KDIGO_2012_CKD_GL.pdf.

7. NICE-SUGAR Study Investigators, Finfer S, Chittock DR, Su SY-S, Blair D, Foster D, Dhingra V, Bellomo R, Cook D, Dodek P, Henderson WR, Hébert PC, Heritier S, Heyland DK, McArthur C, McDonald E, Mitchell I, Myburgh JA, Norton R, Potter J, Robinson BG, Ronco JJ: Intensive versus conventional glucose control in critically ill patients. N Engl J Med 2009; 360:1283–97

8. Lazar HL, McDonnell M, Chipkin SR, Furnary AP, Engelman RM, Sadhu AR, Bridges CR, Haan CK, Svedjeholm R, Taegtmeyer H, Shemin RJ, Society of Thoracic Surgeons Blood Glucose Guideline Task Force: The Society of Thoracic Surgeons practice guideline series: Blood glucose management during adult cardiac surgery. Ann Thorac Surg 2009; 87:663–9

9. Engelman DT, Ben Ali W, Williams JB, Perrault LP, Reddy VS, Arora RC, Roselli EE, Khoynezhad A, Gerdisch M, Levy JH, Lobdell K, Fletcher N, Kirsch M, Nelson G, Engelman RM, Gregory AJ, Boyle EM: Guidelines for Perioperative Care in Cardiac Surgery: Enhanced Recovery After Surgery Society Recommendations. JAMA Surg 2019 doi:10.1001/jamasurg.2019.1153

TEMP-06

Success:

Percentage of patients, ≥18 years age, who undergo an open cardiac surgical procedure under general anesthesia of 120 minutes duration or longer for whom the last non-artifact body temperature measure at the end of the case was greater than or equal to 35.5 degrees Celsius (or 95.9 degrees Fahrenheit).

Reported as an inverse measure (lower = better)

TEMP-07

Success:

Percentage of patients, ≥ 18 years age, who undergo an open cardiac surgical procedures using cardiopulmonary bypass under general anesthesia of >120 minutes for whom the temperature was > 37.5 degrees Celsius while on bypass for over 5 consecutive minutes

Reported as an inverse measure (lower = better)