Cardiac Anesthesia Subcommittee Minutes

April 20, 2022

1:00pm – 2:00pm EST

Zoom

X	Asbahi, Moumen (Beaumont Royal Oak)	X	Kileny, Joel (Trinity- St. Joseph Ann Arbor)
X	Bailey, Meridith (MPOG)	X	Malenfant, Tiffany (MPOG)
X	Buehler, Kate (MPOG)	X	Mathis, Mike (MPOG)
X	Burrage, Peter (Dartmouth)	X	Muehlschlegel, Danny (Brigham and Women's)
X	Brown, Morgan (Boston Childrens)	X	Riggar, Ronnie (MPOG)
X	Coleman, Rob (MPOG)	X	Schonberger, Rob (Yale)
X	Dubovoy, Anna (Michigan Medicine)	X	Shah, Nirav (MPOG)
X	Fisher, Clark (Yale)	X	Wren, Jessica (Henry Ford Health System)
X	Guruswamy, Jayakar (Jay) (Henry Ford Health System)		
X	Griffin, Greg (UNC)		
X	Janda, Allison (MPOG)		
X	Johnson, Rebecca (Spectrum Health/UM-West)		

Meeting Summary

1. **Updates**
    a. **TEMP-06 (Post-bypass Hypothermia Avoidance) is live!** Percentage of adult patients who undergo open cardiac surgical procedures 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 ≥ 35.5 degrees Celsius (or 95.9 degrees Fahrenheit).
    b. Inclusion Thresholds for Reporting
        i. Coordinating Center proposes not reporting a score on the dashboard for measures with less than 75 cases included within the last 12 months
            1. 14/55 sites impacted (excluded) for TEMP 06 and TEMP 07
            2. Comments:
                a. *Nirav Shah (MPOG Quality Director)*: Would recommend allowing sites to review these cases and still give them access, even if low case volume, as there may be some learning from those few cases that are available. Could hide from the site comparison bar graph but include in the individual and departmental case lists for review.
                b. *Mike Mathis (MPOG Research Director)*: Is the low case volume actual open cardiac cases or are they just misclassified as cardiac cases? If the latter, would vote to exclude from the dashboard results.

c. *Danny Muehlschlegel (BWH) via chat*: I agree. Include for the individuals but exclude for analyses.
d. *Rob Schonberger (Yale) via chat*: I agree to leave them out of the bar graph but give them the data.

3. **Conclusion:** Will hide performance scores for departmental and cardiac dashboards (site comparison graphs)/bar graph displays of measure performance for performance reviews, but will attempt to allow those cases to be listed on the case lists if actual cardiac cases.

2. **TEMP-07 (Hyperthermia avoidance):**
   a. Definition: Percentage of adult patients who undergo open cardiac surgical procedures using cardiopulmonary bypass under general anesthesia of 120 minutes case duration or longer for whom the temperature was ≥ 37.5 degrees Celsius (99.5 degrees Fahrenheit) while on bypass for over 5 consecutive minutes.
   b. **Proposed that we report the performance score as an inverse measure (lower score is better)?**
      i. *Danny Muehlschlegel (BWH):* would like to see it as an inverse measure
      ii. **Conclusion:** We will make TEMP-07 an inverse measure
   c. Incorporated perfusionist input from the Perfusionist Workgroup meeting earlier this month (**thank you to those perfusionists!**): if you haven't nominated a perfusionist for the workgroup- please contact ajanda@med.umich.edu to do so.
      1. Feedback from perfusionist workgroup:
         a. Update artifact algorithm to look for any minute-to-minute jumps >1.0°C equivalent rather than >2.0°C
         b. Add Arterial Bypass Cannula Temperature to route hierarchy
         c. Shortened duration of hyperthermia definition to 5 minutes
         d. Recommended discussing with your institutional teams prior to presenting the measure data
   d. Timing: Cardiopulmonary Bypass Start until Cardiopulmonary Bypass End, for those cases with a cardiopulmonary start time documented, but no cardiopulmonary bypass end time, will use Anesthesia End
   e. Artifact Algorithm:
      i. Less than 32.0°C (89.6F)
      ii. Greater than 40.0°C (104.0F)
      iii. Any minute-to-minute jumps >1.0°C equivalent.
         1. Example: 0.25°C /15s, 0.5°C / 30s, 1°C / 1min
   f. Attribution: Any provider signed in for ≥40 minutes from bypass start until bypass end (or the provider signed in for the greatest number of minutes during this period, if this period is <40 minutes) per staff role
   g. Inclusions: All patients, 18 years of age or older, who undergo open cardiac surgical procedures using cardiopulmonary bypass (as determined by Procedure Type: Cardiac Open phenotype and Cardiopulmonary Bypass phenotype) under GA of ≥120 minutes
   h. Exclusions:
      i. ASA 6
      ii. Organ harvest (CPT: 01990)
      iii. Non-cardiac cases as defined as those cases not meeting criteria for the cardiac case type phenotype
      iv. Within the general cardiac case type phenotype, exclude: Transcatheter/Endovascular, EP/Cath groups and Other Cardiac
      v. Non-CPB cases

vi. Cases with age <18

vii. **Comments:**

1. *Anna Dubovoy (Michigan Medicine)*: Are we excluding patients who come off/on ECMO?

a. *Allison Janda (MPOG Cardiac Subcommittee Chair)*: Cannulation or decannulation only cases are excluded from this measure but if they were on ECMO as part of another procedure, would be included.

i. Other Measure Details:

i. If starting temp on initiation of bypass is >37.5, we will exclude the first 30 minutes of the bypass period

ii. If gaps exist for temperature documentation, a given temperature will count for 5 minutes following that documentation time or until the next temperature is documented, whichever is earlier

iii. Temperature priority:

1. Arterial Bypass Cannula Temperature
2. Nasopharyngeal
3. Esophageal
4. Blood or PA catheter
5. Bladder
6. Rectal
7. Zero flux thermometer
8. Other non-core routes (axillary, oral, skin, temporal, tympanic, unspecified)

j. Will formally approve details at this meeting and release the measure soon after (see slide 13 of the presentation for preliminary blinded performance scores)

k. Please discuss measure (current TEMP-07 measure specification found here) with your perfusionist teams to loop them in as soon as possible.

l. Comments/Questions:

i. *Danny Muehlschlegel (BWH) via chat*: Do we capture what temperature the heater/cooler is set at?

1. *Allison Janda (MPOG Cardiac Subcommittee Chair)*: No- we don't typically receive this data from sites into MPOG

3. Next Cardiac Measure: Glucose Management

a. Current GLU-01 Measure: Percentage of cases with perioperative glucose >200 mg/dL with administration of insulin or glucose recheck within 90 minutes of original glucose measurement

b. Considerations:

i. Lower glucose threshold?

ii. Set a shorter threshold for rechecks or are we just concerned with treatment?

iii. Initiation of an insulin infusion or treatment requirement?

iv. Exclusions for specific cardiac cases?

v. Attribution?

c. Glucose Measure Literature/Guidelines (full literature review document here):

i. 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% - (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)

ii. Glycemic variability, a standard deviation of all POC-BG readings, is associated with increased postoperative LOS-ICU, rise in creatinine, and AKI - (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)

iii. 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 - (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.)

iv. 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 - (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)

v. 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%) - (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)

vi. KDIGO - recommends maintaining blood glucose between 110 - 149 mg/dL in critically ill patients - (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.)

vii. Tight glucose control (<150mg/dl) is seen as controversial as risks of hypoglycemia are significant: NICE-SUGAR meta-analysis - (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)

viii. Society of Thoracic Surgeons (STS) Practice Guidelines recommend maintaining serum glucose levels ≤ 180 mg/dL for at least 24 hours after cardiac surgery - (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)

ix. 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 - (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)

d. Using existing GLU 01 definition of >200mg/dL but requiring recheck or insulin administration within 60 minutes for cardiac cases only (instead of 90 minutes):
    i. MPOG mean: 85% SD: 11% (see slide 17 of presentation for blinded performance scores)
e. Using GLU 01 modified definition of >180mg/dL and requiring recheck or insulin admin within 60 minutes for cardiac cases only:
    i. MPOG Mean: 79% SD:14% (see slide 18 of presentation for blinded performance scores)
f. Using GLU 01 modified definition of >150mg/dL and requiring recheck or insulin admin within 60 minutes for cardiac cases only:
    i. MPOG Mean: 64% SD: 18% (see slide 19 of presentation for blinded performance scores)
g. Discussion:
    i. *Anna Dubovoy (Michigan Medicine)*: Would suggest aligning with STS and adopt 180 mg/dL. Also are we going to look at preop. also?
        1. Allison Janda (MPOG Cardiac Subcommittee Chair): personal preference is maintaining a threshold of 180 mg/dL also. Do we want to treat at 180 or treat only if >180? Do we consider recheck sufficient for passing the measure or should we be recommending treatment for BG≥180?
    ii. *Danny Muehlschlegel (BWH)*: Would agree with 180 mg/dL
    iii. *Mike Mathis (MPOG Research Director)*: Same here -- easiest if surgeon goals are the same as anesthesia goals. I assume surgeons from most sites are following the STS guideline?
    iv. *Rob Schonberger (Yale)*: 90 minutes is too long- agree with 60 minute requirement
        1. *Anna Dubovoy (Michigan Medicine)*: would depend on changing perfusion protocols on checking ABGs
        2. *Mike Mathis (MPOG Research Director)*: Agree with both comments -- 90 is too long, but 60 minutes could lead to a need to discuss w/ perfusion and revise protocol... which in my opinion is a great discussion to have
    v. *Allison Janda (MPOG Cardiac Subcommittee Chair)*: **Conclusion:** To recap, group agrees on the following details for the cardiac hyperglycemia management measure:
        1. Threshold of 180 mg/dL
        2. Require treatment unless recheck within 60 minutes was <180mg/dL
        3. Time period for treatment: within 60 minutes
        4. Start with intraop period and eventually expand to periop time period
        5. Attribution: adopt GLU 01 criterion - The provider signed in at the first glucose recheck or first administration of insulin. If neither occurred, then the responsible provider is the one signed in 90 minutes after the high glucose measurement.
        6. Consider developing another measure later on that has the more strict criteria of flagging any case with a glucose >180 (the current STS guidelines), once this measure with the opportunity to treat is established.

4. Goals

a. Build 1 cardiac-specific measure in 2021 (complete!)
    i. Post-bypass hypothermia avoidance

b. Build 1 additional cardiac-specific measure in early 2022 (almost complete!)
    i. On-bypass hyperthermia avoidance
c. Plan next measure in mid-2022 (in progress)
    i. Glucose Management

5. Cardiac Anesthesia Subcommittee Membership

a. Open to all anesthesiologists or those interested in improving cardiothoracic measures
    i. Do not have to practice an active MPOG institution to participate
b. Proposed 2022 meeting schedule
    i. Summer 2022 Meeting: July/August 2022
    ii. Fall 2022 Meeting: November 2022
c. Thank you for continued use of the Basecamp forum for discussion between meetings!

Meeting adjourned at 1400