Cardiac Anesthesia Subcommittee Minutes

September 30, 2024

11:00am – 12:00pm EST

Zoom

Abernathy, Jake (Johns Hopkins)	Lou, Sunny (WUSTL)
Addo, Henrietta (MPOG)	Lopacki, Kayla (Trinity Health)
Barrios, Nicole (MPOG)	Malenfent, Tiffany (MPOG)
Bartoszko, Justyna (Toronto)	Mathis, Mike (MPOG)
Brown, Morgan (Boston Children's)	Meuhlshlegel, J. Danny (Johns Hopkins)
Buehler, Kate (MPOG)	Notorianni, Andrew (Yale)
Clark, Melissa (Michigan)	O'Conor, Katie (Johns Hopkins)
Coleman, Robert (MPOG)	Pantis, Rebecca (MPOG)
Dubovoy, Anna (Michigan)	Pennington, Bethany (WUSTL)
Edelman, Tony (MPOG)	Schonberger, Rob (Yale)
Fisher, Clark (Yale)	Shaygan, Linda (UT Southwestern)
Ghaly, Tammer (Yale)	Shah, Nirav (MPOG)
Goatley, Jackie (Michigan)	Smeltz, Alan (North Carolina)
Govindaswamy, Radhika (Yale)	Smiatacz, Frances Guida (MPOG)
Grewal, Ashanpreet (Maryland)	Stumpf, Rachel (MPOG)
Guruswamy, Jayakar (Jay) (Henry Ford)	Sturmer, David (Michigan)
Heiter, Jerri (Trinity)	Vaughn, Shelley (MPOG)
Janda, Allison (MPOG)	Velten, Markus (UT Southwestern)
Jewell, Elizabeth (MPOG)	Wade, Meridith (MPOG)
Johnson, Rebecca (Corewell)	Wilkens, Eric (Temple)
Kertai, Miklos (Vanderbilt)	Yuan, Yuan (MPOG)
Korenke, Mark (Michigan)	Zhao, Sarah (MPOG)
Lacca, Tory (MPOG)	Zittleman, Andrew (MPOG)

1. **Agenda**
    a. Introduction & announcements

b. Transfusion measures cardiac inclusion updates (TRAN-01/TRAN-02)
c. ABX-03-C Update
d. New Measures: AKI-02-C, ABX-04-C, ABX-05-C
e. Contraction-CS Study: Inotrope barriers/facilitators to use in cardiac surgery
f. New Measure Brainstorming
g. Summary and Next Steps

2. Introductions

a. ASPIRE Quality Team
    i. Allison Janda, MD – MPOG Cardiac Anesthesia Subcommittee Lead
    ii. Michael Mathis, MD – MPOG Director of Research
    iii. Kate Buehler, MS, RN – Clinical Program Manager
b. Cardiac Anesthesiology Representatives joining us from around the US!

3. Measure Review Process

a. Review literature for given measure topic and provide review using MPOG Measure Review Template
b. Present review of literature and recommendations at Cardiac Subcommittee meetings
c. Reviewers' names will be added to measure specifications as well as MPOG Measure Reviewer website

4. Upcoming Cardiac-Focused Measure Reviews

Measure	Review Date	Reviewers
TEMP-06-C: Hypothermia Avoidance	February 2025	Mariya Geube, Cleveland Clinic
TEMP-07-C: Hyperthermia Avoidance	February 2025	Ashan Grewal, UMaryland
GLU-06-C: Hyperglycemia Management	June 2026	Josh Billings, Vanderbilt
GLU-07-C: Hypoglycemia Management	June 2026	Rob Schonberger, Yale
GLU-08-C: Hyperglycemia Treatment	June 2026	Josh Billings, Vanderbilt

a. Thank you in advance for ensuring MPOG Cardiac-specific measures remain relevant & consistent with published recommendations
b. Contact Allison with any questions: ajanda@med.umich.edu

5**. Dissemination of Anonymized Performance Data**

a. Background
    a. At the 9/23 meeting, Quality Committee voted to approve sharing anonymized data with AQI
    b. Anesthesiology Quality Institute (AQI) had requested approval to receive screenshots from MPOG to show variation in care for antibiotic redosing in cardiac surgery (ABX-03-C)

c. AQI may submit the following screenshot (view slides) to CMS as part of their QCDR measure submission (without threshold line included)
d. Demonstrating variation in care would help the AQI measures obtain approval as QCDR measures

6. **Transfusion Measure Discussion**
   a. Background
   b. Transfusion measures were due for review in May 2024
   c. Measure reviews performed by assigned Quality Champions & Coordinating Center and presented to Quality Committee
      i. Jacek Cywinski, MD (Cleveland Clinic) Transfusion Management Vigilance measure review: TRAN-01
      ii. Linda Liu, MD (UCSF) Overtransfusion measure review: TRAN-02

   d. Quality Committee requested Cardiac Subcommittee review transfusion measure exclusion of cardiac cases and determine if:

      i. Only open cardiac cases should be excluded rather than all cardiac cases or,
      ii. Would separate measure(s) for patient blood management in the cardiac population be appropriate?

   e. TRAN-01: Transfusion Management Vigilance

      i. Description: Percentage of adult patients receiving blood transfusion with documented hemoglobin or hematocrit value prior to administration.
      ii. Exclusions:
         1. Age < 18 years
         2. ASA 5 & 6
         3. Postpartum hemorrhage cases
         4. Massive blood loss with EBL ≥ 200 mL and/or 4 or more units of blood transfused
         5. Labor epidurals
         6. Burn cases
         7. Cardiac cases
      iii. Success: Documentation of hemoglobin or hematocrit within 90 minutes prior to transfusion

   f. TRAN-02: Overtransfusion

      i. Description: Percentage of adult patients with a post transfusion hemoglobin or hematocrit value greater than or equal to 10 g/dL or 30%.
      iv. Exclusions:
         1. Age < 18 years
         2. ASA 5 & 6

3. Postpartum hemorrhage cases
4. Massive blood loss with EBL ≥ 200 mL and/or 4 or more units of blood transfused
5. Labor epidurals
6. Burn cases
7. Cardiac cases

v. Success: Hematocrit value documented as ≤ 30% and/or hemoglobin as ≤ 10 g/dL or, No hematocrit or hemoglobin checked within 18 hours of Anesthesia End

g. Update

vi. Cardiac cases are now included in TRAN-01 and TRAN-02

vii. "Ignore" autologous blood transfusion for cardiac cases – cases with only autologous units administered are excluded

viii. Scores for most sites increased modestly. A few sites had a decrease in performance scores for both measures, based on site cardiac transfusion practices

7. **ABX-03-C Update**

a. ABX-03-C: Antibiotic Redosing, Open Cardiac Procedures

I. Description: Percentage of adult patients undergoing open cardiac surgery with an appropriate antibiotic re-dosed for surgical site infection prophylaxis

II. Timing: 120 minutes prior to Anesthesia Start through Anesthesia End

III. Attribution: All anesthesia providers signed in at the time of Anesthesia Start Time

IV. Change: The following antibiotics are now excluded from the measure due to varying half-lives:

1. Ceftriaxone
2. Cefotetan
3. Cefoxitin

V. Score changes were minimal as majority of sites do not routinely use these medications for cardiac surgery.

8. **Acute Kidney Injury – Open Cardiac Surgery Measure Proposal**

a. AKI-02-C: Acute Kidney Injury in patients undergoing Open Cardiac Surgery

i. Description: Percentage of patients undergoing an open cardiac procedure with a baseline creatinine increase of more than 1.5 times within 7 postoperative days or baseline creatinine level increases by ≥ 0.3 mg/dL within 48 hours postoperatively

ii. Inclusion: Adult patients undergoing open cardiac surgical procedures (determined by Procedure Type: Cardiac value code:1)

iii. Success:

1. The creatinine level does not go above 1.5x the baseline level within 7 days post-op
2. The creatinine level does not increase $\geq$ 0.3 mg/dL obtained within 48 hours after Anesthesia End

iv. Exclusions:

1. ASA 6 (including CPT:01990)
2. Cases where a baseline creatinine is not available within 60 days preoperatively
3. Cases where a creatinine lab is not available within 7 postoperative days.
4. Patients with more than one case in a 7-day period. The first case will be excluded if a postop creatinine is not documented for that first case. For example, a patient that has surgery twice in a 7-day period, the first surgery is excluded if a creatinine is not drawn in between cases
5. Patients with pre-existing renal (stage 4 or 5) failure based upon BSA-Indexed EGFR < 30 mL/min/1.73m^2 determined by Preop EGFR (most recent) or MPOG Complication - Acute Kidney Injury value code -2.
6. Open cardiac procedures performed in conjunction with procedures affecting the kidney, bladder, or ureter (specific anesthesia and surgical CPT codes).

ii. Discussion:

1. *Anna Vladimirovna Dubovoy (University of Michigan) via chat:* are mediastinal explorations/chest exposures excluded?
    a. *Allison Janda (MPOG Cardiac Subcommittee Chair):* They should be considered 'cardiac: other' cases and should be excluded from this measure. However, this is dependent on the quality of documentation so if there are cases unintentionally included, it could be related to how the case was scheduled or the CPT code assigned.
    b. *Kate Buehler (MPOG Coordinating Center) via chat:* Cardiac phenotype specifications – only open cardiac cases (value =1) should be included for AKI-02-C.

9. **Antibiotic Selection Measure**

1. ABX-04-C: Antibiotic Selection for Open Cardiac Procedures
    i. **Description**: Percentage of adult patients undergoing open cardiac surgery with the recommended antibiotic agents administered for surgical site infection prophylaxis

ii. **Timing**: 120 minutes prior to Anesthesia Start through Anesthesia End
iii. **Attribution**: All anesthesia providers signed in at the time of Anesthesia Start Time
iv. **Inclusions**: Adult patients undergoing open cardiac surgical procedures
v. **Exclusions**:
    1. Age < 18 years
    2. ASA 6 including Organ Procurement
    3. Patients already on scheduled antibiotics or had a documented infection prior to surgery, as determined by "Patient on Scheduled Antibiotics/Documented Infection" (value: 2) of the ABX Notes phenotype
    4. Non-cardiac, Transcatheter/Endovascular, EP/Cath groups and Other Cardiac cases as determined by the Procedure Type: Cardiac phenotype
    5. Lung Transplant cases as determined by the Procedure Type: Lung Transplant phenotype
vi. Acceptable antibiotic combinations for Open Cardiac Procedures:
    1. Vancomycin + Cephalosporin
    2. Vancomycin + Aminoglycoside
    3. Vancomycin Only
    4. Cephalosporin Only
vii. Cases will be assigned one of the following result reasons:
    1. Passed – Vancomycin + Cephalosporin
    2. Passed – Vancomycin + Aminoglycoside
    3. Passed – Vancomycin Only
    4. Passed – Cephalosporin Only
    5. Flagged – Non-standard antibiotic selection
    6. Flagged – Prophylactic antibiotic not administered (Not documented in MAR)
    7. Flagged – Antibiotic not ordered/indicated per surgeon
    8. Flagged – Not administered for medical reasons
    9. Excluded – Scheduled antibiotics/documented infection
viii. Discussion:
i. *Danny Muehlschlegel (Johns Hopkins):* Allison, what about antibiotic infusions?
    1. *Allison Janda (MPOG Cardiac Subcommittee Chair):* Infusions and bolus doses are included for this measure with the start time considered for the timing of the initial dose and continuation of the infusion should count for subsequent redosing if currently running at the time the redose is due.
ii. *Rob Schonberger (Yale) via chat:* STS: The Society of Thoracic Surgeons (STS) does not recommend vancomycin alone as the primary prophylactic for

cardiac surgery procedures. This is because of the known risk of gram-negative risk to cause mediastinitis.

1. *Kate Buehler (MPOG Coordinating Center):* The STS provides a caveat statement that specifically mentions that there is not enough literature to suggest that an additional antibiotic is required with the initial dose of vancomycin though is strongly recommended for gram negative coverage. At this point, we've opted for the measure to be more lenient and account for all circumstances. Over time, as more literature is published, we hope to make the measure more stringent as advised by this subcommittee.
2. *Kate Buehler (MPOG Coordinating Center) via chat:* The STS Guidelines also recommend gentamicin or other aminoglycoside be administered with vancomycin for gram negative coverage, however, the efficacy of adding an aminoglycoside is not well established in the literature. ABX-04-C draft specification
3. Note: After the meeting, additional literature was provided to Dr. Janda from Bethany Pennington (Washington University) to suggest that Vancomycin alone is not recommended. The measure has since been updated to flag cases in which Vancomycin alone was administered. Measure specification has been updated with this literature as well as the rationale for this decision. Please contact ajanda@med.umich.edu with any questions.
4. *Jake Abernathy (Johns Hopkins):* This may be specific to Johns Hopkins but how would continuous antibiotic infusions be handled?
5. *Allison Janda (MPOG Cardiac Subcommittee Chair):* Those should be passed as long as they are running for the duration or majority of the case. Re-dose should also pass if running at the time a re-dose would be due (4 hours after the start of the bolus or infusion).
6. *Kate Buehler (MPOG Coordinating Center):* We may need to look into some cases for Johns Hopkins. Thought we had accounted for that but perhaps we need to adjust the measure code. Also, worth mentioning for all sites, we are only looking at the IV route. Recommend sites verify mapping is correct for routes as this will result in a flagged
7. *Michael Mathis (MPOG Research Director):* Is there a reason or specific rationale for why Johns Hopkins administers continuous antibiotic infusions for cardiac cases?
8. *Jake Abernathy (Johns Hopkins):* Ancef infusion pre-dated me. From what it sounds like, an increase in sternal wound infections drove this change although I'm not sure we have any data to support that infections have decreased since starting infusions.

iii. Next Steps:

1. Modify measure to flag cases with Vancomycin only administered.
2. Validate and publish ABX-04-C – will post to forum once available on dashboards.
3. Investigate ABX-03 re-dosing antibiotic infusion cases for Johns Hopkins since they should not be flagged.

2. ABX-05-C: Composite Antibiotic Compliance for Open Cardiac
   i. **Description**: Percentage of adult patients undergoing open cardiac surgery with appropriate antibiotic selection, timing, and re-dosing administered for surgical site infection prophylaxis
   ii. **Timing**: 120 minutes prior to Anesthesia Start Time through Anesthesia End Time
   iii. **Attribution**: Departmental Only
      1. Case level attribution, viewable on the dashboard at the case level, not provided to individual clinicians
   iv. **Success**: Case must pass **all 3** antibiotic prophylaxis for open cardiac procedure measures
      1. ABX-02-C / ABX-03-C / ABX-04-C
   v. Inclusions: Adult patients undergoing open cardiac surgical procedures
   vi. Exclusions:
      1. Age < 18 years
      2. ASA 6 including Organ Procurement
      3. Patients already on scheduled antibiotic or had a documented infection prior to surgery, as determined by "Patient on Scheduled Antibiotics/Documented Infection" (value: 2) of the ABX Notes phenotype
      4. Non-cardiac, Transcatheter/Endovascular, EP/Cath groups and Other Cardiac cases as determined by the Procedure Type: Cardiac phenotype
      5. Lung Transplant cases as determined by the Procedure Type: Lung Transplant phenotype
   vii. Cases will be assigned one of the following result reasons:
      1. Passed – Antibiotic Prophylaxis Standards Met
      2. Flagged – Timing, Re-dosing, & Selection Not Met (ABX-02-C, ABX-03-C, & ABX-04-C flagged)
      3. Flagged – Timing & Selection Not Met (ABX-02-C & ABX-04-C flagged)
      4. Flagged – Re-dosing & Selection Not Met (ABX-03-C & ABX-04-C flagged)
      5. Flagged – Timing & Re-dosing Not Met (ABX-02-C & ABX-03-C flagged)
      6. Flagged – Antibiotic not administered on time (ABX-02-C flagged)
      7. Flagged – Antibiotic not appropriately re-dosed (ABX-03-C flagged)
      8. Flagged – Non-standard antibiotics selection (ABX-04-C flagged)
      9. Excluded – Scheduled antibiotics/documented infection
   viii. Discussion:

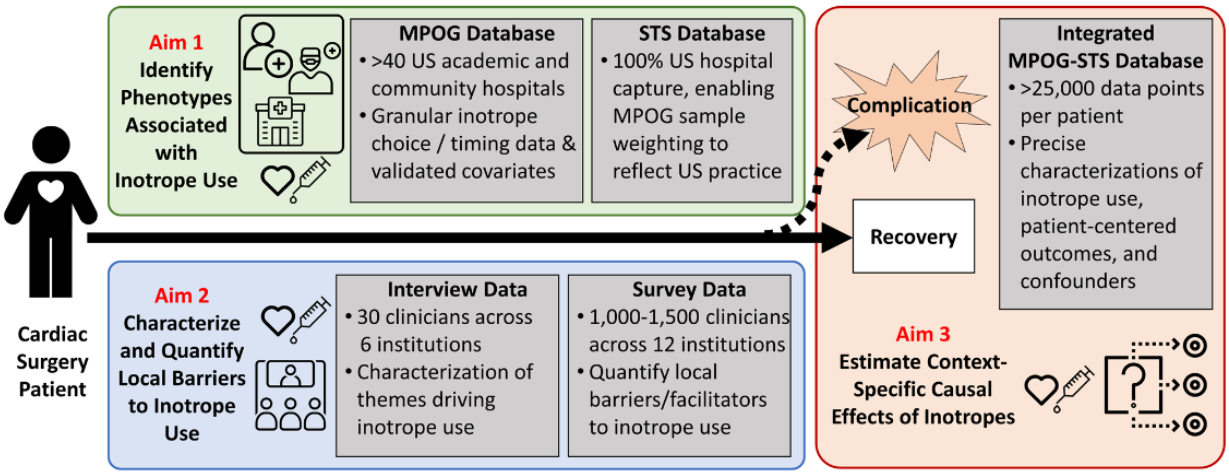
i. *Nirav Shah (MPOG Quality Director):* This the first example of a measure that has pass/flag from other measures. There are some areas like temperature or sustainability that could benefit from a composite measure if sites find this helpful. Will be interested to know how the composite measure for antibiotics is used across sites to improve quality and guide antibiotic administration for cardiac surgery.

10. COmparing iNoTRope prACtice variaTION in Cardiac Surgery (CONTRACTION-CS)

ix. The Problem:
1. Cardiac inotropes have tradeoffs impacting complications after cardiac surgery, yet current evidence fails to capture the nuanced clinical contexts in which they are harmful versus helpful

ii. The Big Questions:
1. What factors currently drive inotrope decision-making?
2. What barriers and facilitators to inotrope practice change?
3. Can we use integrated health data to better estimate context-specific casual effects of inotropes on outcomes?

iii. Specific Aims



iv. Discussion:
1. *Mike Mathis (MPOG Research Director):* Would like to solicit some initial feedback on what are some of the factors that drive site inotrope decision making?
2. *Danny Muehlschlegel (Johns Hopkins):* I adapt to what the Hopkins practice is - it is very much institutional. Unless there is evidence in a certain direction, seems best to go with the common practice at the institution to make sure everyone is comfortable.

3. *Jake Abernathy (Johns Hopkins):* I love this! I've long thought that inotrope decision is cultural, not clinical. If there is no data to drive decisions, how do decisions get made?
    a. Mike Mathis (MPOG Research Director): Everyone goes into this wanting to ensure good care for patients and…variation does exist across hospitals. Will be a fun study to explain why that might be.
4. *Ashanpreet Grewal (University of Maryland) via chat:* @UMaryland Epi is the primary inotrope used post CPB. Its use depends on the patients preCPB Cardiac function
5. *Morgan Brown (Boston Children's Hospital) via chat:* I think institutional preference and surgeon preferences matter. But I think myocardial protection is a big confounder that is difficult to adjust for and is definitely an art. Our surgeons' practices vary a lot.
    a. *Mike Mathis (MPOG Research Director):* Can only go so far with an observational study but we do have STS data that might assist with this analysis. May need to be pragmatic trial in the future.
6. *Tammer Ghaly (Yale) via chat:* I have definitely started things per surgeon preference. A transplant surgeon in fellowship liked low dose dopamine and dobutamine for everybody, but we ran epi as our primary inotrope.
7. *Radhika Govindaswamy (Yale) via chat:* It should largely be based on post op Echo

v. Next Steps:

1. Mike Mathis to continue with this study and provide updates to Cardiac Subcommittee as needed.

11. Next Measure Discussion:

i. Previous suggested topics include:
    2. Antibiotic selection and timing Complete! (ABX-04-C and ABX-02-C)
    3. Neuromuscular blockade reversal
    4. Pulmonary complication avoidance
    5. Hypotension avoidance
    6. Acute kidney injury avoidance Complete! (AKI-02-C)
    7. Handoffs
    8. Transfusion Update – added cardiac cases to TRAN-01/TRAN-02
    9. Other ideas?

ii. Discussion:

1. *Radhika Govindaswamy (Yale) via chat:* Antifibrinolytics in OPCABG – lots of institutional variation
2. *Rob Schonberger (Yale):* With patients that receive large volumes of PRBCs but no plasma, wondering what the group thinks about a new transfusion measure to assess the ratio of PRBCs transfused to units of FFP?
    a. *Anna Dubovoy (University of Michigan):* What are you thinking for this? 1:1:1 for massive transfusion?
    b. *Rob Schonberger (Yale):* I think evidence would support at least 1:1:1. There are examples of an extreme number of PRBC transfusions without any FFP given.
    c. *Anna Dubovoy (University of Michigan):* Should it instead be POC viscoelastic testing measure to guide transfusion?
    d. *Andrew Notarianni (Yale):* Interesting area to explore – especially if we transition to fibrinolytic products over transfusions
    e. *Mike Mathis (MPOG Research Director):* Would recommend an informational measure as the first version of this measure. Viscoelastic data in MPOG would need to be improved before we could develop a true pass/flag measure in this area.
    f. *Alan Smeltz (UNC):* We refer to this as a 'yellow MTP' where several units of cryo or FFP are administered without any PRBCs – would recommend capturing cases where only FFP and cryo are given without any PRBCs.
    g. *Nirav Shah (MPOG Quality Director):* Currently MTP is a blind spot for us in MPOG as we exclude these cases from our transfusion measures and focus only on cases with 1-3 PRBC units transfused.
    h. *Ashanpreet Grewal (UMaryland) via chat:* If POC testing is used then it will be tough to also assess if a pre-determined formula was followed such as 1:1:1
    i. *Tammer Ghaly (Yale) via chat:* 4 or more units without something like viscoelastic testing or another product might be reasonable. How would we factor cell saver transfusion into that?
    j. *Mike Mathis (MPOG Research Director) via chat:* FYI - the OB subcommittee has a research project on transfusion ratio (PCRC 250 on "current projects tab of MPOG website). Cardiac subcommittee might do a similar project.
    k. *Tammer Ghaly (Yale) via chat:* Also, should the metric consider units given in ICU after leaving the OR? For example, if we

decide after closing, we want to give FFP or platelets, but didn't have them in the room before leaving. Should those units be factored into the metric if given within 30 or 60 minutes of ICU arrival?

l. *Clark Fisher (Yale):* Could also consider hypotension between anesthesia start and when the case starts (when lines are placed) as a measure

m. *Allison Janda (MPOG Cardiac Subcommittee Chair):* Could consider a transfusion measure based on this discussion or perhaps another hypotension measure specific to cardiac cases. Does that seem like the best places to start for 2025 measures?

vi. Next Steps:

1. Plan to build either a transfusion-related measure or a hypotension measure for cardiac surgery in 2025. We plan to present some preliminary data for these topics during our February 2025 meeting.

12. Cardiac Anesthesia Subcommittee Membership

i. Open to all anesthesiologists or those interested in improving cardiothoracic measures

ii. Do not have to practice at an active MPOG institution

iii. Upcoming meetings:

   a. December 2024 (unblinded data review *pre-registration will be required*)
   b. February 2025
   c. June 2025
   d. November 2025

iv. Thank you for using the forum for discussion between meetings

v. Summary/Next Steps

Meeting adjourned: 1202