Cardiac Anesthesia Subcommittee Minutes

December 13, 2022

1:00pm – 2:00pm EST

Zoom

x	Atwood, Tammy (Henry Ford Allegiance)	X	Kertai, Miklos (Vanderbilt)
x	Bailey, Meridith (MPOG)	x	Kumar, Vikram (Massachusetts General Hospital)
x	Barrios, Nicole (MPOG)	X	Low, Ying (Dartmouth)
x	Bottiger, Brandi (Duke)	x	Malenfant, Tiffany (MPOG)
x	Brown, Morgan (Boston Childrens)	x	Mathis, Mike (MPOG)
x	Buehler, Kate (MPOG)	x	Riggar, Ronnie (MPOG)
x	Clark, Melissa (MSTCVS)	x	Schwerin, Denise (Bronson)
x	Fisher, Clark (Yale)	X	Shook, Doug (Brigham & Women's)
x	Heiter, Jerri (Trinity - St. Joseph Ann Arbor)	x	Theurer, Patty (MSTCVS)
x	Janda, Allison (MPOG)	x	Venkataramani, Ranjani (UCSF)
x	Katta, Guarav (Henry Ford Health System)	x	Welle, Erin (University of Michigan)

Meeting Summary

1. **Research Opportunity**
    a. The VARSITY Surgery group is conducting a study as a part of our NHLBI-funded R01 titled "Reuse of Operating Room Team View Digital Recordings of Cardiac Surgery for Evaluating Non-Technical Practices" that seeks to:
        i. learn more about the relationship between peer based assessments of intraoperative non-technical practices and risk-adjusted complication rates after cardiac surgery
        ii. evaluate the feasibility of automating computer-based analyses of digital recordings to assess intraoperative non-technical practices
    b. They plan to recruit cardiothoracic surgeon peer assessors, cardiac anesthesiology peer assessors, and perfusion peer assessors
    c. **The group is inviting attending cardiac anesthesiologists to participate as peer reviewers.** Reviewers will receive a $45 Amazon gift card after completing each peer assessment assignment
    d. Time commitment:
        i. Fill out the Peer Reviewer Informed Consent form (5 mins)
        ii. Complete a demographic survey (5 minutes)
        iii. Complete a ~45-50 minute training on a validated anesthesia non-technical skills assessment tool (ANTS)
        iv. Sign an attestation form prior to viewing any recordings and attest to adhering to data privacy

v. Review and assess video segments representing cardiac surgery operations (~10 minutes each)
vi. There is no pre-specified number of recorded segments you may analyze

e. If you or a colleague is willing to participate, please fill out the Peer Reviewer Informed Consent and email me (ajanda@med.umich.edu) or Korana Stakich-Alpirez (kstakich@med.umich.edu) and we will request your contact information to set up a UMich account to view the trainings and video assessments

2. Glucose Management - Cardiac Literature Review

a. MSTCVS (Michigan Cardiac Surgery CQI) has chosen glycemic management as a focus area for 2023. MPOG is aligning with these efforts with the new glycemic management measure: GLU-06-CARD

b. 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% [1]

ii. Glycemic variability, a standard deviation of all POC-BG readings, is associated with increased postoperative LOS-ICU, rise in creatinine, and AKI [2]

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 3

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 [4]

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%) [5]

vi. KDIGO - recommends maintaining blood glucose between 110 - 149 mg/dL in critically ill patients [6]

vii. Tight glucose control (<150mg/dl) is seen as **controversial** as risks of hypoglycemia are significant: NICE-SUGAR meta-analysis [7]

viii. Society of Thoracic Surgeons (STS) Practice Guidelines recommend **maintaining serum glucose levels ≤ 180 mg/dL for at least 24 hours after cardiac surgery** [8]

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** [9]

3. Next Cardiac Measure: GLU-06

a. Current form from the discussions the last meeting: 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 >/=180mg/dL was either treated with insulin or rechecked and found to be below 180mg/dL within 60 minutes.

b. **Measure Period:** Anesthesia Start ⟶ Anesthesia End

c. **MPOG Concepts Considered**

Insulin MPOG Concept IDs		Glucose MPOG Concept IDs	
10229	Insulin Aspart	**3361**	POC- Glucose (Fingerstick)
10230	Insulin Glargine	**3362**	POC- Glucose (Unspecified Source)
10231	Insulin Novolin	**3405**	POC- Blood Gas - Glucose
10232	Insulin NPH	**5003**	Formal Lab-Glucose, Serum/Plasma
10233	Insulin Regular	**5036**	Formal Lab-Blood Gas, Glucose
10659	Insulin- Unspecified		

d. **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.
e. **Inclusions:** All patients, 18 years of age or older, who undergo open cardiac surgical procedures (as determined by Procedure Type: Cardiac phenotype) under general anesthesia of 120 minutes duration or longer.
f. **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. Cases with age <18
g. **Limitations:** Any glucose checks not entered into the EHR will not be captured
h. Remaining Questions:
    i. Restrict to “open cardiac” only? Or also “transcatheter/endovascular”?
        1. After discussion, keep to “open cardiac” for now.
    ii. Ok to continue validating and proceed with publishing in early 2023?
        1. After discussion, ok to proceed with validating, will bring any additional questions or changes to the group via Basecamp and aim to publish before our next meeting.
i. Discussion:
    i. Mike Mathis (MPOG Research Director): Should we include other cardiac-like cases, like transcatheter/endovascular? At face value, seems like we should include all cardiac case types but the primary measure should focus on open cardiac so you can compare teh same kind of case across sites and then a secondary group of cases to track glucose measurement for the other case types
        1. Douglas Shook (Brigham and Women’s): I agree. I consider transcatheter cases as cardiac procedures and the more we include them in our discussion it sets a standard that we consider those patients to be included in our domain.
        2. Allison Janda (MPOG Cardiac Sub. Chair): I agree. Ideally we would be able to toggle to open cardiac vs. transcatheter cases only. However, some of these cases may not be very long whereas we may want to only focus more granularly at open cardiac as a first step and have the discussion later on if we want to add them in.
            a. Douglas Shook (BWH): Sounds reasonable.
    ii. Morgan Brown (Boston Children’s) via chat: Do you think this amount of variation means that people don’t follow/believe in this metric? We don’t stick

to this at Boston Children's, but we are a children's hospital with a young adult population.

1. Allison Janda (MPOG Cardiac Sub. Chair): This is a very interesting point. We are on the low end of performance for this measure at U of M and it isn't because we don't believe in it or try to follow it but more so that the first glucose we take are within normal ranges and then need to improve on anticipating when the glucose will rise. We definitely believe glucose management is important in cardiac cases..
2. Mike Mathis (MPOG Research Director): I don't think any institution would say they don't care about taking care of their patients but more so, we're busy and have lots going on during these cases. During the Michigan MSTCVS meeting, the discussion led to more of a cross-collaboration issue between perfusionists and anesthesiologists in communicating the results and following up with insulin treatment. Excited to see what happens when we start working on this measure and discussing it during this subcommittee.
    a. Erin Welle (University of Michigan) via chat - To add on to Mike, I think it's also a function of how much plegia the surgeon wants and variation in perfusionist practice during plegia administration. there's a wide variation at U of M how much plegia is being given
3. Guarav Katta (Henry Ford Health System): Is this useful information for me to have as a cardiac anesthesiologist? Yes- it is useful for me to look at these cases and determine if there was anything different I could have done differently when reviewing these cases. If we restrict ourselves to only open cardiac, I think we'll have more cases excluded over time as we move away from open cardiac as an approach procedurally. Can address that longer term.
4. Vikram Kumar (MGH): Considering the utility of this measure - should we add a limit for time frame to assess how long it was >180mg/dL before requiring treatment? Also, in support of looking at open cardiac only at this point.
    a. Allison Janda (Cardiac Sub. Chair): Resounding feedback from the last meeting was we don't know how long is too long for exposure to a high glucose to result in a poor outcome. Great research project but we don't know what the time duration would be at this point.
    b. Mike Mathis (MPOG Research Director): Agree this is a great research project and we will do this.

iii. Clark Fisher (Yale) via chat: I apologize, since I wasn't able to make the last meeting - do we have a sense of how many of the flagged cases had an out of range glucose the first time during the case that an anesthesiologist encountered them?

1. Allison Janda (Cardiac Sub. Chair): This is an interesting point. Should these patients be included or excluded? Currently we are including these cases and are looking Anesthesia start to Anesthesia End. The overall approach I use is to treat the elevated glucose in the holding room prior to the case starting so that it should be lower (ideally <180)

when we recheck it on our first ABG. Even for patients with an elevated glucose at baseline, there is utility in flagging the case for review to reflect on whether we should improve our management just prior to the OR as well even though this measure captures anesthesia start until anesthesia end.

2. Clark Fisher (Yale): I would prefer to exclude them but not to the extent of holding up this measure - especially patients coming from inpatient who have not been managed well prior and there is limited time to treat glucose at the beginning of the case with all other anesthesia tasks
    a. Allison Janda (MPOG Cardiac Sub. Chair): We still want to know if we're managing these patients well or not, so I'm not sure if we want to exclude them. Definitely a gray zone- we do need a way to at least flag these patients differently.

iv. Brandi Bottiger (Duke) via chat - Allison, thinking of your idea of a staged approach. Ultimately, will there be a way to view "all cardiac cases" with metric performance, and be able to filter to bypass cases or DHCA?

1. Allison Janda (MPOG Cardiac Sub. Chair) - We currently don't have these filters. Determining which cases had bypass or not is difficult based on documentation since it is so variable at different institutions. Even if we did have the ability to toggle/filter, It would not be 100% accurate - more like 90% accurate for bypass cases for example.
2. Brandi Bottiger (Duke) - That's understandable and can understand it must be a mapping nightmare
3. Allison Janda (MPOG Cardiac Sub. Chair) - We are getting a little better at catching some of these mismappings during the onboarding process for new sites. I think that this is a potential filter for the future.
4. Kate Buehler (MPOG Clinical Program Manager)- Hopefully in 2023 those filters for some case types that Dr. Bottinger mentioned will be available!

v. Tammy Atwood (Henry Ford Allegiance) via chat - Completely agree with Michael's comments. We used to use a dextrose base cardioplegia and it required a lot of communication and timing on insulin dosing, cardioplegia dosing and drawing of blood glucoses to measure.

1. Allison Janda (MPOG Cardiac Sub. Chair) - It would be hard to have cardioplegia type as a covariate because this is not routinely documented in MPOG, however we are doing adjusted AKI and mortality measures which are on the horizon.

vi. Guarav Katta (Henry Ford Health System): Would it be possible to find out at the granular level what type of cardioplegia was used with the cases that are hypoglycemic.

1. Mike Mathis (MPOG Research Director) - Yes, however only with STS integrated data with MPOG. With MPOG alone its challenging to do but we are continuing to develop phenotypes in this area.
2. Allison Janda (MPOG Cardiac Sub. Chair) - STS data only applies to 8 to 9 institutions that are currently merging their STS data with MPOG.
3. Tammy Atwood (Henry Ford Allegiance) via chat - I wonder if this has been reviewed with PERForm data specifically (cardioplegia and glucose levels) or is this part of the STS data you review. I realize that doesn't

include all of MPOG participants.

vii. Consensus: Restrict to open cardiac only. Continue validating and proceed with publishing this measure next year.

4. **Unblinded Data Review (all site-specific comments redacted and all institution names, if mentioned redacted)**
    a. All sites that perform >75 open cardiac procedures annually are presented on the slides to follow
    b. This is a closed meeting: registration required to receive the Zoom link.
    c. Only those sites who have a participant on the cardiac subcommittee are unblinded
    d. Cardiac Anesthesia Champions were notified that unblinded data would be shared and were given the opportunity to opt out
    e. No sites emailed us to express a desire to be excluded from this review
    f. TEMP 06 and TEMP 07 unblinded data presented & discussed during the meeting: unblinded data removed from slide deck before posting to the website. Please contact the Coordinating Center if interested in unblinded data review at a future meeting!
5. Discussion (TEMP-06):
    a. Douglas Shook (BWH) - We will definitely have patients who will fail this. We go upstairs at 34.5 for specific cases intentionally. My only concern about the 120 minute definition is that it is possible that some of our take-backs/bleeds that have open cardiac are in this measure? Those can be more difficult than the ones that are planned scheduled procedures. good information to know to address those issues.
        i. Allison Janda (Cardiac Sub. Chair) - This includes both bypass and non-bypass cases, but yes, this would include any bring-back that is at least 120 minutes.
    b. Erin Welle (University of Michigan) via chat- Is this only looking at the last temperature before leaving the room? Or are able to look at the temp coming off bypass vs leaving the room?
        i. Allison Janda (MPOG Cardiac Sub. Chair)-This is only looking at the last non-artifact temperature (and if not available, looks at the first recorded temperature in the ICU)
    c. Guarav Katta (Henry Ford Health System) - If there is no temp within 30 mins of anesthesia end (pre or post anesthesia end), the flowchart says flag as no available temperature. Does that count as failure for the unblinded bar graph you posted just now Allison? Or is that just simply excluded outright?
        i. Allison Janda (MPOG Cardiac Sub. Chair) - Yes we still include that case but we decided to flag cases that didn't have a temperature within 30 minutes before or after anesthesia end since there should be continual monitoring and a temperature taken upon arrival to the ICU.
    d. Mike Mathis (MPOG Research Director)- I think the next step is to breakdown the reasons as to why cases are flagging for this measure and if it's a data issue or a practice issue.
        i. Allison Janda (MPOG Cardiac Sub. Chair)- If you are reviewing cases and notice a trend please reach out to the coordinating center. We appreciate any feedback or mapping improvement suggestions you may have for your institution.
    e. Discussion (TEMP-07):
        i. Clark Fisher (Yale): Would be valuable to break out the hypothermic arrest patients- sometimes the speed at which we come off bypass and exit the room may be a factor. Looks like we may need to convince providers to slow down and take time to warm the patient before leaving the room
            1. Allison Janda (MPOG Cardiac Sub. Chair)- We can't break out the HCA patients at this point, but we tend to have a longer post-bypass time at our institution and continue to warm the patient so I think that could be

contributing to the ability to warm patients post bypass.

ii. Brandi Bottiger (Duke): I could think of 10 questions I could ask just looking at this graph- thanks for doing this to start the conversation around practice.
iii. Douglas Shook (BWH): This data really makes me think- would be nice to see the sites
iv. Erin Welle (U.Michigan) - I'd be curious to see what other institutions' protocols are for warming, because that definitely is driving our numbers here
v. Ying Low (Dartmouth) - This has been an ongoing discussion with our surgeons. We do mostly CABG/Valve procedures who could be warmer after surgery. Would be interested in looking at transfusion data compared to hypothermia rates to foster communication with the surgeons.
    1. Allison Janda (MPOG Cardiac Sub. Chair) - agree there are variation in concerns across institutions as well as case type.
    2. Brandi Bottiger (Duke) - Would be interesting to overlap bleeding metrics with hypothermia. Jinx
vi. Clark Fisher (Yale) via chat - Speaking to the cultural basis of practices, fascinating to see how much colder the Northeast is
vii. Mike Mathis (MPOG Research Director) - If others have stories like Ying, in which MPOG could help provide data to make compelling case to change practice patterns, let us know.
viii. Guarav Katta (Henry Ford): Of the top 5 institutions that are doing well on both measures AND have a lot of cases, looks like [redacted] is the only one. I'd be interested if they at some point could share their thoughts. They appear to be the institution with large numbers of cases and doing well on both

6. **Cardiac Anesthesia Subcommittee Membership**
    a. Next meetings:
        i. April 2023
        ii. August 2023
        iii. Nov/Dec 2023
    b. Open to all anesthesiologists or those interested in improving cardiothoracic measures
        i. Do not have to practice at an active MPOG institution to participate
    c. Thank you for continued use of the Basecamp forum for discussion between meetings!

Meeting adjourned at 1407

References

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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.
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