Cardiac Anesthesia Subcommittee Minutes

August 22, 2022

1:00pm – 2:00pm EST

Zoom

	Asbahi, Moumen (Beaumont Royal Oak)		Kileny, Joel (Trinity- St. Joseph Ann Arbor)
x	Billings, Josh	x	Varelmann, Dirk (Brigham & Women's)
x	Bailey, Meridith (MPOG)	x	Malenfant, Tiffany (MPOG)
x	Buehler, Kate (MPOG)	x	Mathis, Mike (MPOG)
	Burrage, Peter (Dartmouth)		Muehlschlegel, Danny (Brigham and Women's)
	Brown, Morgan (Boston Childrens)		Riggar, Ronnie (MPOG)
x	Coleman, Rob (MPOG)		Schonberger, Rob (Yale)
x	Dubovoy, Anna (Michigan Medicine)		Shah, Nirav (MPOG)
	Fisher, Clark (Yale)	x	Wren, Jessica (Henry Ford Health System)
	Guruswamy, Jayakar (Jay) (Henry Ford Health System)	x	Korenke, Mark (Michigan Medicine)
	Griffin, Greg (UNC)	x	Theurer, Patty (MSTCVS)
x	Janda, Allison (MPOG)	x	Jelacic, Srdjan (UWashington)
	Johnson, Rebecca (Spectrum Health/UM-West)	x	Bottiger, Brandi (Duke)
x	Atwood, Tammy (Henry Ford Allegiance)	x	Kumar, Vikram (Massachusettes General Hospital)

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. Research/Collaboration Opportunity #2

a. Dr. Drake a cardiac surgeon at the Michigan Society of Thoracic and Cardiovascular Surgeons (MSTCVS) is developing a peri-interventional cardiac imaging quality program
b. Asking our subcommittee for any interested individuals to have a seat at the table as this program is being developed (inside and outside the state of Michigan)
c. If you or a colleague is willing to participate, please email me (ajanda@med.umich.edu) and I will connect you with Dr. Drake with MSTCVS

3. Sustainability - Cardiac Considerations

a. **Current Measures:**
i. **SUS-01:** Percentage of cases with mean fresh gas flow (FGF) equal to, or less than 3L/min, during administration of halogenated hydrocarbons and/or nitrous oxide.
ii. **SUS-02:** Percentage of cases where carbon dioxide equivalents normalized by hour for cases receiving halogenated agents and/or nitrous oxide is less than carbon dioxide equivalents of 2% sevoflurane at 2L FGF = 2.58 kg CO2/hr during the maintenance period of anesthesia
iii. **SUS-04:** Percentage of cases with mean fresh gas flow (FGF) equal to, or less than 2L/min, during administration of halogenated hydrocarbons and/or nitrous oxide.

b. Considerations
i. Currently includes cardiac cases and only captures the anesthesia ventilator fresh gas flow concepts (not from bypass)
ii. Should we exclude cases with inhaled nitric oxide due to mandatory high flows for all SUS measures (currently only excluded for SUS-01)?
iii. Does not include any of the pump fresh gas flow or sweep concepts on bypass
iv. While on bypass, we tend to put our FGFs down to 0.2L/min so that is what would be captured by MPOG and the SUS measures
v. What are your practice patterns for FGF on bypass?
vi. Since we as anesthesiologists do not contribute to the decision as to what FGF or sweep the perfusionists are running on bypass, limiting those FGFs is very challenging, and sweep isn't captured by all institutions in MPOG, we did not include those sweep concepts if they are contributed

c. Discussion
i. *Josh Billings, MD* - should still document/include nitric oxide.
ii. *Allison Janda, MD* - if Nitric oxide was administered it wouldn't treat the case any differently regarding changing our FGFs since the higher FGF are required for

nitric oxide. Feedback for these cases may be less helpful for providers since that high FGF is non-modifiable.

iii. *Kate Buehler* - Nitric oxide is picked up through variables mapped to the associated nitric oxide MPOG concept.

iv. *Allison Janda, MD* - We are excluding cases with Nitric oxide for SUS-01. Should we exclude the entire case? or should we exclude that time period alone?

v. *Mike Mathis, MD* - Excluding the time period of nitric oxide only will be difficult unless it is a minute-by-minute capture.

vi. *Allison Janda, MD* - We should consistently either include or exclude Nitric oxide for both SUS-01, SUS-02 and SUS-04. You can't change or really avoid the high FGF with Nitric Oxide.

vii. *Kate Buehler* - Including Nitric Oxide impacts a very small number of non-cardiac cases which is why we excluded them originally and the change in performance scores is very small.

viii. *Vikram Kumar, MD* - I would advocate for excluding cases with Nitric oxide from SUS-01/02/04. It might be better to focus on flagging cases without Nitric oxide to improve performance.

ix. **Consensus**: Exclude Nitric Oxide cases from all Sustainability measures.

4. **TEMP-07 (Hyperthermia avoidance):**
   a. Definition Update: % of patients, ≥ 18 years age, who undergo open cardiac surgical procedures using cardiopulmonary bypass under general anesthesia of >120 minutes for whom the temperature did rise above 37.5 degrees Celsius while on bypass for over 5 consecutive minutes (inverse measure)
   b. The Perfusionist Work Group met earlier this year and made some suggestions that have been incorporated, thank you!
   c. We are working with the Michigan Society of Thoracic and Cardiac Surgeons (MSTCVS) and their network of perfusionists to publicize and gain their input prior to releasing the measure
   d. Recommended discussing with your institutional teams prior to presenting the measure data
   e. Quick poll: What have you done to reach out to your institution's perfusionist teams and what has their feedback been?
   f. Discussion
      i. *Josh Billings, MD (via chat)* - our usual care is to limit nasal temp to 37 when rewarming, so this measure is consistent with our institutional protocols..

2. Glucose Management - Cardiac Literature Review
   a. 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 glucose recheck or first administration of insulin. If neither occurred, then the responsible provider is the one signed in 60 minutes after the high glucose measurement
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. *Anna Dubovoy, MD* - TAVRs are much shorter and might be difficult to have meaningful impact.
2. *Mike Mathis, MD* - I agree with Anna. Glucose management matters for all cases however if part of our goal is to understand how our glycemic

management changes over time, its a much fairer comparison across institutions to include all. It might be worth looking at performance breakdown and counts for these different case cohorts.

3. *Josh Billings, MD* - Through assessment of the literature we have determined this is important to measure, but currently we don't have plans to look at whether or not implementing these measures/flags impact patient outcomes. To start we may want to include all to collect more data and then do a further sub group analysis.
4. *Allison Janda, MD* - Our current infrastructure doesn't currently support 'sub' quality measures, although that is something we're working towards. If we wanted to analyze two separate cohorts we would need to create two separate measures. By flagging cases within one measure, they can look more into which cases are flagged and complete the analysis that way. If all case types are included in a single measure, can filter by case type to see the change in performance for each cohort.

ii. Any considerations for escalations of insulin treatment?
   1. *Anna Dubovoy* - Hyperglycemia is a focus of ours
   2. *Allison Janda* - This may be a great feature to include in a future glucose measure.

iii. Any considerations for frequency of checks?
   1. *Allison Janda* - This may be a great feature to include in a future glucose measure.

iv. Also develop a measure directly mirroring the STS threshold of any glucose <180 resulting in a flag?
   1. *Vikram Kumar, MD* - I worry that we may confuse providers if we set a threshold of 180 for treatment if the actual STS guideline is that there shouldn't be any glucose measurements >180.
   2. Allison Janda, MD - Previously we had discussed a lower threshold but there was concern among the subcommittee of hypoglycemia. We had been leaning towards the threshold of 180 during previous subcommittee discussions.
   3. *Josh, Billings, MD* - I agree with the STS definition. Unless we feel strongly that STS has erred in their own guidelines, we should try to align with them.
   4. *Allison Janda, MD* - Our policy at Michigan is to treat > 150 and since the glucose tends to increase when we go on bypass, we escalate treatment quickly but are frequently getting above 180. We are currently working on this with our endocrinologists.
   5. Mike Mathis, MD - When we introduce a measure, there is a certain amount of QI that happens and as we improve and involve, we dial up the pressure and build a tighter measure. You want to calibrate the measure so it is achievable. Another approach then is to build these measures in stages starting with an 'easier' threshold as we learn about these cases.
   6. *Kate Buehler* - This is an extremely low denominator on a monthly or quarterly basis so will be able to quickly assess the 5-10 cases that were flagged. We could start by aligning with STS and assess the same measure and revisit after it has been implemented.
   7. *Allison Janda, MD* - I agree with simplicity of being as consistent as possible with the STS guidelines and that we should simplify our measure to flag any case with glucose >180.

i. **Consensus**:
   i. Restrict GLU-06 to open cardiac cases only and simplify the measure to be

consistent with STS guidelines and flag any case with glucose >180, and develop a second process measure at our next meeting. Table the escalating glucose measure for consideration.

4. **Next Meeting: November 2022**
    a. Provide preliminary data for GLU-06 with a flag for ANY intraoperative glucose > 180: likely an informational measure at this point
    b. Provide preliminary data for GLU-07 with threshold of glucose > 180: treated Y/N
    c. Provide preliminary data for GLU-07 with threshold of glucose >150: treated Y/N
    d. Unblinded Review
        i. TEMP-06 and TEMP-07 measure performance data for your hospital will be included as your hospital is represented on the Cardiac Subcommittee
        ii. The unblinded data will consist of site comparison graphs of scores for the two measures with the institution names visible (examples to follow)
        iii. Members will be asked to register for this meeting and attest to a confidentiality statement beforehand
        iv. If the Cardiac Subcommittee member from your hospital will not be attending the meeting and you would like your hospital's data to not be shown, please let us know so that your data can be removed from the graphs
        v. We will also email the quality champions at your institution who may not be members of the Cardiac Subcommittee

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. Thank you for continued use of the Basecamp forum for discussion between meetings!

Meeting adjourned at 1404

References

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