# Cardiac Anesthesia Subcommittee Minutes

**December 22, 2021**

**1:00pm – 2:00pm EST**

**Zoom**

| | | | |
|---|---|---|---|
| X | Bailey, Meridith (MPOG) | X | Malenfant, Tiffany |
| X | Buehler, Kate (MPOG) | X | Mathis, Mike (MPOG) |
| X | Coleman, Rob (MPOG) | X | Muehlschlegel, Danny (Brigham and Women's) |
| X | Dubovoy, Anna (Michigan Medicine) | X | Riggar, Ronnie (MPOG) |
| X | Guruswamy, Jayakar (Jay) (Henry Ford Health System) | X | Schonberger, Rob (Yale) |
| X | Janda, Allison (MPOG) | X | Shah, Nirav (MPOG) |
| X | Katta, Gaurav (Henry Ford Health System) | X | Saad, Manal (MPOG) |

**Meeting Summary**

1. **General Quality Committee Cardiac Considerations**
    a. **TRAN-01:** Percentage of cases with a blood transfusion that have a hemoglobin or hematocrit value documented prior to transfusion
        i. Exclude peds < 18y
        ii. Exclude cardiac cases
        iii. Exclude transfusion cases with profound/prolonged hypotension requiring vasopressor
        iv. Massive Transfusion Exclusion: Update default PRBC unit definition change from 350  300mL
    b. **TRAN-02:** Percentage of cases with a post transfusion hemoglobin or hematocrit value greater than or equal to 10 g/dL or 30%
        i. Exclude Patients < 18yo (per pediatric subcommittee)
        ii. Exclude cardiac cases
    c. Remove Cardiac Exclusion?
        i. **NMB-01**: Percentage of cases with a documented Train of Four (TOF) after last dose of non-depolarizing neuromuscular blocker
        ii. **NMB-02:** Administration of Neostigmine, Sugammadex, and/or Edrophonium before extubation for cases with non-depolarizing neuromuscular blockade

    **Discussion:** Subcommittee agrees to exclude cardiac cases from TRAN-01 and TRAN-02 measures. Include cardiac cases in NMB-01 and NMB-02 measures if they are extubated intraop.

2. **Cardiac Procedure Type Phenotype**
    a. Schema: Sequentially bins cases based on utilized fields if present
        i. Open Cardiac
        ii. Transcatheter/Endovascular
        iii. EP/Cardiac catheterization
        iv. Other cardiac

v. No/Non-cardiac
vi. Missing/unknown/unable to determine

b. Current Status: Public, continuing to test internally
c. Discussion

**3. Post-bypass Hypothermia Avoidance (TEMP-06)**

a. % of patients, ≥18 years age, who undergo open cardiac surgical procedures under GA of >120 minutes for whom last non-artifact body temperature prior to anesthesia end was ≥35.5℃
   i. Including open cardiac cases
   ii. Last non-artifact temperature documented, if more than one,
   iii. Preferentially use core temperature
      1. Use core temperature measure if present in the anesthesia record within 15 minutes of the last documented non-artifact body temperature
      2. If no temp. documented or temp below 35.5C pre-anesthesia end, will accept temps up to 30 mins post-anesthesia end to account for identification and correction of hypothermia by the anesthesia team
b. TEMP-06 Measure Temperature Flow Chart (see slide deck)
c. TEMP-06 Preliminary Performance (see slide deck)
   i. Next Steps:
      1. Currently in PROD (as of today)- thanks to everyone for their feedback to publish the first cardiac-specific measure as a subcommittee!
      2. Refining the measure will continue after we launch, please let us know if you see inappropriately flagged or passed cases on your dashboards
      3. Will list 'N/A' for sites with less than 100 cases included for the measure for the last 12 months as a buffer for inappropriate inclusion of sites who do not perform cardiac cases or very few cases annually

**4. Hyperthermia Avoidance - Literature Review**

a. Literature Review (see slides for full references)
   i. 2020 Updates from the Adult Cardiac Anesthesiology Section of STS (Del Rio et al., 2020)
      1. Avoidance of temp >37 while on bypass
   ii. Guidelines for perioperative care in cardiac surgery: enhanced recovery after surgery recommendations (Engelman et al., 2019)
      1. Avoid >37C for arterial outlet blood temperature while on bypass
   iii. STS Practice Guidelines for temperature management while on bypass (Engelman et al., 2015)
      1. Avoid >37C for arterial outlet blood temperature while on bypass
   iv. ERAS cardiac recommendations (Gregory et al., 2020)
      1. Avoid >37.9C while on bypass
   v. Current cardiac hyperthermia avoidance Anesthesia Quality Institute measure
      1. AQI65, for cerebral hyperthermia avoidance defines hyperthermia as ≥37C while on bypass
b. Preliminary MPOG data shared (see slide deck)

**5. Hyperthermia Avoidance (TEMP-07-CARD) Measure Details**

a. % of patients, ≥ 18 years of age, who undergo open cardiac surgical procedures using cardiopulmonary bypass under general anesthesia of >120 minutes for whom the temperature did not rise above 37.5 degrees Celsius while on bypass for over **10**

**consecutive minutes**

b. Timing: Cardiopulmonary bypass start until cardiopulmonary bypass end (phenotype exists but needs improvement)
c. Artifact algorithm:
    i. Less than 32℃ (89.6℉)
    ii. Greater than 40℃ (104.4℉)
    iii. Any minute-to-minute jumps >0.5℃ equivalent
    iv. Example: 0.125℃/15s/0.25℃/30s, 1℃/2mins)
d. 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
e. 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
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. Non-CPB cases
    vi. Cases with age <18

**6. TEMP 07 Perfusionist Input**

a. Hyperthermia threshold definition
    i. Temperature did not rise above 37.5 degrees Celsius while on bypass for over **5 consecutive minutes**
b. Exclusions/Limitations:
    i. If starting temp on initiation of bypass is >37.5, consider excluding that case, or excluding potentially the first 30 minutes of the bypass period
**c. Discussion:**
    i. *Anna Dubovoy* (University of Michigan): Proposal of a measure that looks at the rate of rewarming
        1. *Mike Mathis (MPOG)*: Agree. The Artifact algorithm was developed without considering cardiac cases where temperatures can jump quickly.
        2. *Allison Janda (MPOG)*: Minute-to-minute temp jumps > 0.5 degree Celsius is a tight threshold. Perfusionists also brought up concern of rewarming too quickly. I think a good first step would be to update the algorithm to minute-minute jump > 1.0 degree Celsius for cardiac cases to take into account the rewarming with bypass
        3. *Anna Dubovoy (University of Michigan)* via chat: from our perfusion rewarming protocol: the target temperature for rewarming is 37°C bladder.
            a. Rewarm maintaining an 8-12°C gradient between the venous blood and the water bath temperatures.
            b. Rewarm at a rate of ~1°C/3 mins over a minimal period of 60 minutes.
            c. Caveat: If the patient rewarms at a rate > ~1°C/min particularly early after rewarming initiation, inform the attending surgeon and anesthesiologist and reduce the rewarming rate.
        4. *Mike Mathis (MPOG)*: Two pieces to consider is 1) rate of rewarm and 2) delta temperature. I don't think we have the water bath temperature

from MPOG institutions which may be a limitation.

5. *Allison Janda (MPOG):* Will bring this back to the perfusionist workgroup to determine if we flag cases that were rewarmed too quickly or if we create a separate measure. Will depend on whether or not the necessary data to capture rewarming details is available across MPOG centers
6. *Anna Dubovoy (University of Michigan)*: Prioritizing nasal or core for this measure?
    a. *Allison Janda (MPOG)*: Prioritizing nasal over core for this measure which is different from the TEMP 06 measure.

d. Call for additional perfusionist input:
    i. Please email (ajanda@med.umich.edu) with the contact information of any potentially interested perfusionists
e. Next perfusionist workgroup meeting: End of January/early February
    i. Will be invited to our next subcommittee meeting

**7. Future Measure Planning - Data Variation (see slide deck)**

a. AKI Avoidance - Cardiac AKI-01
    i. Percentage of cases that did not have AKI (the baseline creatinine increased more than 1.5 times within 7 postoperative days or the baseline creatinine level increased by = 0.3 mg/dL within 48 hours postoperatively) for open cardiac cases
    **ii. Discussion:**
        1. *Anna Dubovoy (University of Michigan)*: I wonder if there is a difference in mini approach vs sternotomy because of differences in cannulation techniques
        2. *Allison Janda (MPOG):* Some surgical CPTs can help narrow it down but the CPTs aren't reliable enough to determine further granularity of procedure type.
        3. *Mike Mathis (MPOG):* Research idea would be surgical approach and its risk on postoperative AKI. First step would be to start with examining the CPT codes to see if we can tease out specific-case types and approach using phenotypes.
b. Postop pulmonary complications avoidance
    i. Extubation criteria - data is poor
c. Glucose management
    i. Cardiac GLU-01 (>200 mg/dL)
        1. % of cases with perioperative glucose > 200 mg/dL with administration of insulin or glucose recheck within 60 minutes of original glucose measurement
        2. Mean: 85%  SD: 11%
    ii. Cardiac GLU-01 (>180 mg/dL)
        1. % of cases with perioperative glucose > 180 mg/dL with administration of insulin or glucose recheck within 60 minutes of original glucose measurement
        2. Mean: 79%  SD: 14%
    iii. Cardiac GLU-01 (>150 mg/dL)
        1. % of cases with perioperative glucose > 150 mg/dL with administration of insulin or glucose recheck within 60 minutes of original glucose measurement
        2. Mean: 64%  SD: 18%

**d. Discussion:**
    i. *Anna Dubovoy (University of Michigan)*: We should align our measure with STS which flags cases where glucose >180 mg/dL

ii. *Allison Janda (MPOG):* This is an inconsistency with intraoperative glucose protocols across institutions. We can dig deeper into the data and apply STS guidelines
iii. *Gaurav Katta (Henry Ford Health System, Detroit)*: We have much more control over glucose management without input from the perfusionist. Therefore, we would have a stronger say in glucose parameters in comparison to AKI which is heterogenous.
iv. *Mike Mathis (MPOG)*: I would put this to a vote on basecamp. Agree with Gaurav that AKI is less attributable to the anesthesiologist. I think we should have a hypoglycemia counter measure similar to the hyper/hypothermia cardiac measures.
v. *Gaurav Katta (Henry Ford Health System, Detroit)*: My understanding is STS does not have a hypoglycemia measure. That's a good point. We should consider adding that measure and we can share that information with our surgeon colleagues.
vi. Summary: Will put glucose management vs. AKI-avoidance to a vote via Basecamp.

**8. Goals**

a. Build 1 cardiac-specific measure in 2021
    i. Post-bypass hypothermia avoidance
b. Build 1 additional cardiac-specific measures in early 2022
    i. On-bypass hyperthermia avoidance
c. Plan next measure in late 2021
    i. AKI Avoidance?
    ii. Glucose Management?
    iii. Other?

**9. 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. Winter 2022 Meeting: February/Early March 2022
    ii. Summer 2022 Meeting: June 2022
    iii. Fall 2022 Meeting: November 2022
c. Thank you for continued use of the Basecamp forum for discussion between meetings!

**Meeting adjourned at 1400**