Cardiac Anesthesia Subcommittee Minutes

December 9, 2025

2:00pm – 3:00pm EST

Zoom

Tammy Atwood, Henry Ford Health	*Mike Mathis, University of Michigan Health*
Karsten Bartels, University of Michigan Health	*Michael McCaughan, UMH - Sparrow*
Justyna Bartoszko, University Health Network	*Kam Mirizzi, MPOG*
Kate Buehler, MPOG	*Katie O'Conor, Johns Hopkins*
Mei Calabio, MPOG	*Rebecca Pantis, MPOG*
Ruth Cassidy, University of Michigan	*Bethany Pennington, WashU*
Jackie Goatley, University of Michigan	*Megan Rolfzen, University of Michigan*
Ashan Grewal, University of Maryland	*Rob Schonberger, Yale New Haven Health*
Jerri Heiter, Trinity Health	*Frances Guida Smiatacz, MPOG*
Allison Janda, University of Michigan	*Abdul Tabbara, Henry Ford Health*
Daniel Kinney, Yale New Haven Health	*Meridith Wade, MPOG*
Vikram Kumar, Mass General Brigham	*Andrew Zittleman, MPOG*
Tiffany Malenfant, MPOG	

Meeting Start: 1402

Announcements

- Vice Chair Recruitment
  - Cardiac Subcommittee Vice Chair / Co-Chair position open (minimum 2-year term;
  - Responsibilities: ~2–4 hrs/month
    - help set subcommittee direction, co-lead measure development and review.
  - Interested faculty should submit their interest to MPOG QI Director (Nirav Shah) at nirshah@med.umich.edu and MPOG Cardiac Subcommittee Chair (Allison Janda) at ajanda@med.umich.edu by January 5th, 2026
- Upcoming Cardiac Measure Reviews - 2026
  - GLU-06-C (Hyperglycemia Avoidance): Josh Billings (Vanderbilt).
  - GLU-07-C (Hypoglycemia Avoidance): Rob Schonberger (Yale New Haven Health).
  - GLU-08-C (Hyperglycemia Treatment): Josh Billings (Vanderbilt).
  - Reviewers will be credited in measure specs and on the MPOG website.

Measure Updates

- TRAN-05-C – Coagulation Monitoring, Open Cardiac

- **Definition:** Adult open cardiac cases receiving non-RBC blood products (FFP, platelets, cryo, factor or fibrinogen concentrates) with coagulation testing (TEG/ROTEM, platelet count, PT/INR, PTT, fibrinogen) performed between anesthesia start and end.
- Some sites' with 0% performance could reflect incomplete mapping (TEG/ROTEM, etc.) rather than true practice gaps.
- **Discussion:**
    - *Michael Mathis (University of Michigan):* Just one specific detail to keep in mind: the timing of the lab draws is between anesthesia start and anesthesia end, unless I'm understanding that incorrectly.
        - *Allison Janda (University of Michigan):* That is true, other than for TEG and ROTEM, because some institutions just timestamp them with the date of the case. We count those as a pass when all of the labs are dated at, for example, 12:01 on the date they were obtained. If they are obtained on the date of the case for TEGs, ROTEMs, or those parameters, then they are included as a pass. So that's a small caveat there, Mike, but yes—PT/INR, PTT, and similar labs are time-stamped and must fall between anesthesia start and end.

- GLU-06-C – Hyperglycemia Avoidance
    - Identified a provider attribution "Swiss cheese" loophole.
    - Attribution rules have been updated; corrected results will appear on dashboards January 2026.

New Measure Proposal – Cardiac Hyperglycemia Successful Treatment

Presenter: *Ashan Grewal (University of Maryland)*

- **Rationale:**
    - GLU-06-C (no BG >180 mg/dL) is heavily influenced by preop control.
    - GLU-08-C ensures that BG ≥180 mg/dL is treated or rechecked within 30 minutes, but does not guarantee control by end of case.
    - Performance on GLU-08-C is high (≈82–85% overall), suggesting teams are responding to high glucose, but there is no metric for final intraoperative glucose status.
- **Proposed Definition:** *Percentage of adult patients (≥18 years) undergoing open cardiac surgery under general anesthesia (duration ≥120 minutes) whose* ***last intraoperative blood glucose*** *before anesthesia end is* ***≤180 mg/dL****.*
- **Attribution:**
    - Providers attributed if signed into the case for the **last 90 minutes**, allowing at least two checks and opportunity to treat.
    - Mirrors TEMP measure logic; if multiple providers in the same role overlap, all receive attribution.
- **Inclusions/Exclusions:**
    - Same as GLU-08-C: adult open cardiac procedures; exclude ASA 6, organ harvest (01990), non-cardiac, transcatheter/endovascular, EP/cath, other cardiac groups, and age <18.

Discussion:

- *Allison Janda (University of Michigan):* Thank you so much, Ashan. I think this is a really great measure. There's a big gap in research and in the STS data that informs the 180 mg/dL cutoff with respect to the duration of time patients are exposed to glucose over 180 that is clinically relevant. It's easy to say, "If 180 is bad, more time over 180 is also bad." I think it is a good goal

to ask, “By the time you’re out of the OR, is the glucose less than 180?”—without a strict requirement like, “Did you have one glucose that was elevated and did it drop under 180 for the next check?” That’s not always the safest practice. For example, if your glucose is 300, the goal shouldn’t just be to drop it to 180. So, this really gets at considerations we had when developing GLU-08-C, and it also addresses a gap in some of the literature.

Michael Mathis (University of Michigan): I think it’s really good, and I like the provider attribution at the end of the case and the thoughtful approach with using 90 minutes. I think that’s a good threshold, and thanks for looking at the TEMP measure and how we counted the last temperature in the OR and attributed providers. If we make this consistent with that approach, I think that’s helpful too.

Allison Janda (University of Michigan): Great. Any objections to moving forward with this measure? I think we already have three positive votes—Ashan, Mike, and me. Are there any other positive votes that people want to mention, or anyone who thinks we shouldn’t proceed with developing this measure in the new year?

Karsten Bartels (University of Michigan): (Thumbs up reaction noted in Zoom.)

Decision:

- Group approved moving forward with ‘GLU-14-C’ development in 2026.

Unblinded Performance Review

Unblinded data are confidential, no screenshots or external sharing. Only sites with >75 open cardiac cases, and a subcommittee member are displayed.

GLU-06-C – Hyperglycemia Avoidance

- Definition: % of adult open cardiac cases with all intraoperative BG ≤180 mg/dL (anesthesia start to 30 minutes after anesthesia end; rare D50 artifact exception).
- MPOG-wide performance:
  - Many sites <80–90%
  - Hyperglycemia is difficult to avoid due to high diabetes prevalence and cardioplegia solutions containing glucose.
- **Discussion**
  - *Site A Provider*: At Site A, the GLU-06 quality measure is being sent out directly to providers, which means there is more attention to the measure, and that has contributed to the improvement we are seeing.
    - *Allison Janda (University of Michigan):* How does it go out to the providers?
      - *Site A Provider*: It goes out in two different ways. We also dropped our treatment threshold to 150 mg/dL, and that has helped contribute to the improvement as well.
  - *Site B Provider*: At Site B, GLU-06 performance improved significantly after we adopted a standardized glucose protocol. We began treating hyperglycemia much earlier—first at 120 mg/dL, then at 110 mg/dL—with insulin. The protocol increased provider awareness and ensured a consistent approach. The biggest factors were starting insulin sooner and strengthening coordination with perfusion. Anesthesiologists and perfusionists aligned their practices, understanding when cardioplegia or perfusion-guided insulin boluses would raise glucose. Our protocol now has anesthesiologists managing the infusion while perfusionists give small boluses at set thresholds. That teamwork and early treatment were the key drivers of improvement.

        - *Ashanpreet Grewal (University of Maryland):* Are you handling pre-operative hyperglycemia in a specific way, or is it individualized?
            - *Site B Provider*: In pre-op, if a patient is diabetic — regardless of whether the surgery is cardiac surgery — an insulin sliding scale is ordered if the patient is diabetic. This was implemented in mid-2024 or early 2025. Prior to this, the nurse would report the blood glucose and then insulin would be ordered. There is a low ceiling for GLU-06. It is hard to get to 100 percent. It was great to go from about 25 percent to 65 percent, but there will be a point where we max out.
    - *Allison Janda (University of Michigan):* That is where the importance of a countermeasure comes in. If you achieve 100 percent on GLU-06, we would not know what is happening with hypoglycemia unless we looked. GLU-07 is designed to flag cases with blood glucose less than 70 mg/dL.

GLU-07-C – Hypoglycemia Measure

- Definition: % of adult open cardiac cases with BG <70 mg/dL intraoperatively (start to 15 minutes after anesthesia end); success if lowest BG ≥70 or if low BG is corrected within 15 minutes.
- Lower GLU-07 values are better (fewer hypoglycemic events).
- **Combined GLU-06 vs GLU-07:**
    - High GLU-06 performance does not correlate with high GLU-07 hypoglycemia.
- **Discussion:**
    - *Michael Mathis (University of Michigan):* I will just say that it is interesting to see that some sites have pretty high rates. I was surprised to see that there is a good number of sites with over 10 percent of cases flagged. I would be interested to know how many of those are severe episodes — for example, a glucose of 68 mg/dL versus 45 mg/dL would be a big difference. I do not know if it is worth following up in more detail, but that is something I am curious about.
        - *Allison Janda (University of Michigan):* Yes, a value of 68 mg/dL versus 45 mg/dL would be a big difference. We have not delved into that specific breakdown yet, but it is a good point.

GLU-08-C – Hyperglycemia Treatment

- Definition: % of adult open cardiac cases in which any BG ≥180 mg/dL is treated with insulin or rechecked <180 mg/dL within 30 minutes.
- Performance: Generally excellent across MPOG; many institutions >80%.
- Discussion:
    - *Allison Janda (University of Michigan):* I want to highlight a few specific sites, starting with Site C.
    - Site C Provider: At our site, there has been an increased focus on glucose measures in general. Glucose measures are being reported, and that visibility has contributed to improvement. There was a gradual implementation where people became more aware of their performance and started adjusting practice.
        - Site C Provider #2: From our side, there has also been increased attention because this has become an internal metric that gets reported out and is used for incentive pay. Once that was announced, people started pre-emptively treating hyperglycemia more aggressively.

    - *Ashanpreet Grewal (University of Maryland):* For GLU-06, my question is about how we handle pre-operative hyperglycemia in the context of this measure and how we define a ceiling for performance.
        - *Allison Janda (University of Michigan):* GLU-06 is measured from anesthesia start to 30 minutes after anesthesia end. We do not take the patient's pre-operative glucose into account within the GLU-06 denominator or numerator. This is not a perfect measure, and that is why the goal is 90 percent and not 100 percent.
        - *Michael Mathis (University of Michigan):* One idea as we refine the measure is for QI champions to receive flags for cases with glucose between 70 and 180 mg/dL at the start of the case, for the purpose of recognizing the baseline glucose and then recognizing glucose values throughout the case — differentiating mid-case glucose from early-case glucose.
            - *Ashanpreet Grewal (University of Maryland):* That would help us better define a ceiling for GLU-06 performance and frame our QI interventions.
            - *Allison Janda (University of Michigan):* Yes, this would help people frame their QI intervention.
- **GLU-06 vs GLU-08 Comparison:**
    - Some sites show moderate GLU-06 but excellent GLU-08, indicating strong treatment behavior once hyperglycemia occurs, but persistent pre-op/within-case hyperglycemia.

Decision: GLU-06 will be enhanced to **flag the first intraoperative BG value** so sites can differentiate baseline vs intraoperative control.

TEMP-06-C – Hypothermia Avoidance

- **Definition:** % of adult open cardiac cases where **final core temp ≥35.5°C** (timing from CPB start → 30 min post-anesthesia, or phenotyped start/end for non-CPB cases).
- Performance is generally good; intentional hypothermia (e.g., DHCA, pulmonary thromboendarterectomy) is expected in some cases.
- Route breakdown shows many flagged cases linked to missing or unmapped temperature data, not necessarily true hypothermia.

Action Item:

- Sites should verify temperature probe mapping and documentation (e.g., core temp sources) with local MPOG teams.

TEMP-07-C – Hyperthermia Avoidance on CPB

- **Definition:** % of adult open cardiac cases on CPB with **core temp >37.5°C** for **>5 consecutive minutes** during bypass.
- **Discussion**
    - *Site B Provider:* We have seen meaningful improvement over the last two years. One of the main contributors to this improvement has been the perfusion team's attention to this measure. Perfusionists became much more engaged with rewarming practices, specifically avoiding rewarming at too rapid of a rate. Historically, peak temperature during rewarming was problematic, and this was directly targeted as part of the improvement process.
    - *Tammy Atwood (Henry Ford Health):* Can you go back to the temperature graph? The performance was not what I expected to see for our site.

- *Allison Janda (University of Michigan):* If you do not currently have access to your site dashboard, I would recommend reaching out to your local MPOG champion so that you can obtain access and look at your site-specific data in more detail.

BP-07-C – Low MAP Avoidance During Induction

- **Definition**: % of adult open cardiac procedures where MAP <55 mmHg for ≥5 minutes is avoided during induction (anesthesia start → surgery start).
- **Performance:** Very high overall; metric reflects combined influence of patient severity, induction technique, and institutional practice.
- **Flagged case breakdown:**
  - Most cases use arterial lines, sometimes with concurrent NIBP.
  - Sites with only NIBP in cardiac cases likely have mapping issues.

Action Item:

- Sites with unexpected BP-07 performance should review arterial vs NIBP mapping to ensure all invasive BPs are correctly captured.

Next Steps

- Next Cardiac Subcommittee meetings: February 2026, June 2026, and two additional dates later in 2026.
- Basecamp remains the primary forum for between-meeting discussion.

Meeting adjourned: 1459

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FULL TRANSCRIPT

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Allison Janda (University of Michigan): Great. Awesome. Well, let's get started in light of just keeping on schedule. Our agenda's pretty full today, as we're talking about some of the quality measures that we've created and the unblinded review for those—hence the registration for this meeting. So we'll get going to make sure we have time for discussion for all of these.

Agenda Overview and Introductions

Allison Janda (University of Michigan): As far as the agenda today, we're going to go through some announcements and then a measure proposal from Dr. Grewal for GLU-14-C. Our cardiac glucose measures are currently GLU-06-C, GLU-07-C, and GLU-08-C, and then there was a batch of new general glucose measures, so that's why we skipped ahead to GLU-14 in the cardiac cadence. Then we're going to go through the unblinded performance review for the three glucose measures we have:

- GLU-06-C, which is hyperglycemia avoidance;
- GLU-07-C, hypoglycemia avoidance; and
- GLU-08-C, intraoperative hyperglycemia treatment.
- TEMP-06-C is hypothermia avoidance,
- TEMP-07-C is hyperthermia avoidance, and then
- BP-07-C is hypotension avoidance in the peri-induction period.

For those who haven't already been to a quality committee meeting, my name is Allison. I'm an anesthesiologist at the University of Michigan, and I'm heading up the MPOG Cardiac Anesthesia Subcommittee as Chair. Mike Mathis helps with that as well on the faculty side.

Meridith and Mei really make everything happen, and I really, really appreciate them for helping with all the graphs and the slides and for putting together the slide deck for today, as well as preparing all the materials that we'll go through for the unblinded reviews today.

Thank you to everybody who's joining us from across MPOG institutions, which really extend beyond the U.S. I need to edit that introductory slide to make it not so U.S.-centric, because we have representatives from the University Health Network in Toronto and from Beirut participating on the Cardiac Subcommittee, so thank you for participating.

Call for Cardiac Subcommittee Vice-Chair

Allison Janda (University of Michigan): We are still seeking a Cardiac Subcommittee co-chair or vice chair. That would be somebody who would serve a minimum two-year term and help shape the direction of the Cardiac Subcommittee, and help with the work that I am doing with Meridith and Mei.

It would be about two to four hours per month of time commitment. There is a more formal job description in the slides, but if you're interested, please submit your name to Dr. Nirav Shah, our MPOG QI Director, and to me by January 5th so that we can collate all the potential folks who are interested.

Measure Review Process and Upcoming Reviews

Allison Janda (University of Michigan): The measure reviews that were mentioned on the previous slide are really meant to foster a continuing reassessment of all the measures that we are creating based on current evidence. Every three years, all our measures go up for review. So, when a measure is published, three years later we review it. We have asked folks to participate in these reviews previously and to present a review of the literature and recommendations at Cardiac Subcommittee meetings. Your name gets added to the measure specifications as well as to the measure reviewer website, so you do get public credit for doing this work.

For the upcoming cardiac-focused measure reviews, we've asked:

- GLU-06-C (Hyperglycemia Management) – June 2026 – to be reviewed by Josh Billings (Vanderbilt).
- GLU-07-C (Hypoglycemia Management) – June 2026 – to be reviewed by Rob Schonberger (Yale New Haven Health).
- GLU-08-C (Hyperglycemia Treatment) – June 2026 – to be reviewed by Josh Billings (Vanderbilt).

The Cardiac Subcommittee is the newest of the subspecialty subcommittees, but we already have measures that have been in place for three years. We completed our first reviews earlier in 2025, which is a real milestone from my perspective. If you have any questions about serving as a reviewer, feel free to contact me.

Measure Update: TRAN-05-C – Coagulation Monitoring, Open Cardiac

Allison Janda (University of Michigan): We're going to launch into some measure updates. First off, one of the measures that we talked a lot about at the last meeting is TRAN-05-C, or coagulation monitoring for open cardiac cases. We refined the definition a little bit during that meeting to be: The percentage of adult patients undergoing open cardiac surgery who received a transfusion and had coagulation testing performed (a TEG, ROTEM, platelet count, PT/INR, PTT, or fibrinogen) with administration of fresh frozen plasma, platelets, cryoprecipitate, factor concentrates, or fibrinogen concentrates.

The timing is from anesthesia start to anesthesia end. If anything non-red blood cell is given—essentially platelets, plasma, cryoprecipitate, factor or fibrinogen concentrate—we're checking whether this was guided by laboratory testing. Some of this is a little bit hard to see on the slide depending on how big your screen is, but all of these flow charts are generated for each quality measure and are available with the measure specifications on the MPOG quality website. These are all accessible for you to visualize.

The result reasons are:

- Pass if coagulation testing (e.g., ROTEM, TEG, platelet count, PT/INR, PTT, or fibrinogen) is checked in the context of any factor, cryoprecipitate, or platelet administration.
- Flagged if you did not check coagulation testing under those circumstances.

We exclude:

- Non-open cardiac procedures,
- Patients less than 18 years of age,
- Cases where blood products are not given,
- Cases where only autologous blood, cell saver, or red blood cells were used, and
- Certain cases based on ASA class and procedure type.

This is the MPOG-wide performance of TRAN-05-C. A percent pass of zero does not necessarily mean that people are not ever doing this. Many institutions do not fully map their coagulation testing (ROTEMs, TEGs, etc.), and that can be a huge barrier to this measure. I really want to mention this as a kind of public service announcement: if you are looking at your dashboards and you see performance on this measure that you don't expect, it could be because you're not completely mapping some of these variables.

These are considered "niche" items to map when sites are undergoing the behemoth workload of onboarding. If someone who is onboarding doesn't necessarily have the same lens as a cardiac anesthesiologist—who would want these mapped—or isn't routinely checking them themselves, they might not think to make sure that these are mapped. So if you see yourself as a low-performing site and you're thinking, "Hey, that's not true," it's probably just because we're not seeing your data.

We then show performance across MPOG cardiac sites for the past 12 months. Because this is an unblinded review, we put everyone's name on the slide for those sites that have members on the Cardiac Subcommittee. These slides with site names will not be published on the website. However, you can always look at your dashboards to see which bar is yours and your overall percentage performance for TRAN-05-C. The blue bar is percent performance, and the orange hash represents case volume at your institution.

Discussion:

Allison Janda (University of Michigan): Any questions about the TRAN-05-C measure or anything people want to call out just looking at the unblinded performance?

> *Michael Mathis (University of Michigan Health):* Just one specific detail to keep in mind: the timing of the lab draws is between anesthesia start and anesthesia end, unless I'm understanding that incorrectly.
> *Allison Janda (University of Michigan):* That is true, other than for TEG and ROTEM, because some institutions just timestamp them with the date of the case. We count those as a pass when all of the labs are dated at, for example, 12:01 on the date they were obtained. If they are obtained on the date of the case for TEGs, ROTEMs, or those parameters, then they are included as a pass. So that's a small caveat there, Mike, but yes—PT/INR, PTT, and similar labs are time-stamped and must fall between anesthesia start and end.

Measure Update: GLU-06-C – Hyperglycemia Avoidance

Allison Janda (University of Michigan): One other update is GLU-06-C, which is the hyperglycemia avoidance measure. There was a provider attribution "Swiss cheese" loophole that someone identified. We responded to that by updating the provider attribution rules. Corrected results will be available on your dashboards in January 2026.

New Measure Proposal: GLU-14-C – Cardiac Hyperglycemia Successful Treatment

Ashan Grewal (University of Maryland): Hi everybody. I'm one of the cardiac anesthesiologists at the University of Maryland. I'll be presenting a proposed new measure for hyperglycemia treatment in

cardiac surgery patients. Currently, we have two hyperglycemia-related measures that we're familiar with:

GLU-06-C, as Allison mentioned, is hyperglycemia avoidance. Success on that measure means that there were no blood glucose values above 180 mg/dL for an adult cardiac surgery patient undergoing an open cardiac procedure.

It's a good point to have, but it really reflects whether the patients we're bringing into the operating room have good glucose control, since that is not fully under the intraoperative anesthesiology team's control.

GLU-08-C is treatment of any glucose that's above 180 mg/dL within 30 minutes, or a recheck that is found to be below 180 mg/dL within 30 minutes. To me, that measure really just brings this to the team's notice and prompts folks to treat anything above 180 mg/dL to keep with the STS guidelines.

This slide shows performance over the last 12 months. Even if you went back further, performance has been about 40–45% for all the institutions. You can imagine that this is a much bigger task to improve, because it requires better pre-operative planning to make sure all patients not only are undergoing appropriate diabetes treatment, but also know and follow the directions they receive regarding taking their medications.

If patients skip medications and present with a higher glucose the morning of surgery, and it's not corrected to below 180 mg/dL, they go to the OR, it gets checked, and the case fails GLU-06-C. So it's not surprising that improvement on that measure has been tough to come by.

Over the past two years, since GLU-08-C was introduced in September of 2023, performance has gradually improved. The average is somewhere between 82% and 85%, and more than two-thirds of the institutions score 80% or above. I think the message has been received, and most teams are following up and treating glucose values that are above 180 mg/dL. But that is, to me, really the first step toward getting blood glucose under control. Next slide, please.

One of the reasons to propose this new measure is so that it's not just that we "do something" about a glucose that's above 180 mg/dL, but that we either follow the glucose-management or hyperglycemia protocol we have, or we're able to see whether that protocol is successfully bringing blood glucose below 180 mg/dL by the end of the case.

A description of the proposed measure would be: Percentage of adult patients undergoing open cardiac surgical procedures under general anesthesia of 120 minutes' case duration or longer for whom the last blood glucose measure did not exceed 180 mg/dL by anesthesia end.

In a way, this measures continuous treatment in a thoughtful way to control blood glucose so that at least by the end of the case it is better controlled, and then glucose can continue to be controlled once the patient gets to the post-op setting. Next slide, please.

Attribution is a little challenging, because if I sign into the case toward the end, it's going to be tough for me to control that. But I looked at the TEMP measure, and in that one, attribution is given if you've been signed in for the last 40 minutes of the case, so you have some control over it.

At my institution, about 80% of the cases are started and finished by the same faculty member. There is a large proportion of cases that would be completely under my control and thus attributed to me. I picked 90 minutes at the end of the case because it's enough time to check a glucose at least twice and then be able to treat it in an effort to bring it down.

I agree that it's not perfect, but I think it's still important to have provider attribution so that people can see their own performance and see whether they need to change their practice. In the event that two or more providers in the same role are signed in at the same time, then both should receive that feedback. Next slide.

The inclusions and exclusions are essentially the same as for GLU-08-C: All patients ≥18 years of age, both with and without diabetes, who undergo open cardiac surgical procedures (as determined by the cardiac procedure phenotype) under general anesthesia of 120 minutes' duration or longer. We exclude ASA 6, organ harvest cases (CPT 01990), non-cardiac cases, and within the general cardiac case type phenotype we exclude transcatheter/endovascular, EP/cath, and other cardiac groups, as well as cases with age <18.

I'm going to open it up to any questions, comments, or concerns.

Discussion:

Allison Janda (University of Michigan): Thank you so much, Ashan. I think this is a really great measure. There's a big gap in research and in the STS data that informs the 180 mg/dL cutoff with respect to the duration of time patients are exposed to glucose over 180 that is clinically relevant.

It's easy to say, "If 180 is bad, more time over 180 is also bad." I think it is a good goal to ask, "By the time you're out of the OR, is the glucose less than 180?"—without a strict requirement like, "Did you have one glucose that was elevated and did it drop under 180 for the next check?" That's not always the safest practice. For example, if your glucose is 300, the goal shouldn't just be to drop it to 180.

So this really gets at considerations we had when developing GLU-08-C, and it also addresses a gap in some of the literature. Does anybody else have any comments, questions, feedback, or thoughts on the measure?

> *Michael Mathis (University of Michigan):* No, I think it's really good, and I like the provider attribution at the end of the case and the thoughtful approach with using 90 minutes. I think that's a good threshold, and thanks for looking at the TEMP measure and how we counted the last temperature in the OR and attributed providers. If we make this consistent with that approach, I think that's helpful too.
>
> *Allison Janda (University of Michigan):* Great. Any objections to moving forward with this measure? I think we already have three positive votes—Ashan, Mike, and me. Are there any other positive votes that people want to mention, or anyone who thinks we shouldn't proceed with developing this measure in the new year?
>
> Karsten Bartels (University of Michigan): (Thumbs up reaction noted in Zoom.)

Allison Janda (University of Michigan): Great, we'll move on with the unblinded review. Thank you so much, Ashan, for that wonderful presentation and for directing us to a new measure that's very feasible. This is a great example of a feasible measure to develop.

It builds on the existing validation work we've already done for the Cardiac Subcommittee through GLU-06-C, GLU-07-C, and GLU-08-C, and it takes advantage of data where MPOG has high granularity. Those are the kinds of things that make a robust, accurate measure when paired with the clinical relevance you discussed.

Ashan Grewal (University of Maryland): Thank you.

Unblinded Data Review

Allison Janda (University of Michigan): As we move into the unblinded data review, I want to remind everyone of the expectations for confidentiality. Per the terms and conditions outlined during the registration process, a culture of openness and trust is critical to the development of this collaborative effort to improve quality, and a commitment to confidentiality is required to further the goals of ASPIRE. The information we are about to review is privileged and confidential and should only be discussed within the confines of the Cardiac Subcommittee meeting.

This includes any and all patient information; any and all patient identifiers or information that are considered privileged and protected health information under HIPAA; any specific MPOG QI registry case information; and any information discussed regarding a specific site outcome or specific MPOG site result or analysis. All anesthesiology data presented, including but not limited to outcome reports, are also considered confidential. Taking screenshots, pictures, or videos of any of the data slides is prohibited.

Only sites that perform more than 75 open cardiac procedures annually are presented on the slides that follow. This is a closed meeting; registration is required to receive the Zoom link. Only those sites that have a participant on the Cardiac Subcommittee are unblinded. Cardiac anesthesia champions were notified that unblinded data would be shared and were given the opportunity to opt out, and no sites contacted us to be excluded.

We're going to start with GLU-06, which is the hyperglycemia avoidance measure. As we have talked about a lot today, glucose is an important thing to be managing for a cardiac anesthesia case. This measure is the percentage of adult patients undergoing open cardiac procedures in whom any intraoperative blood glucose value did not exceed 180 mg/dL, and that threshold is consistent with the STS established threshold. We include glucose values from anesthesia start until 30 minutes after anesthesia end.

We do have a caveat: if you gave some D50, for instance, and then drew off that line and found that your glucose was 700 — which is very unlikely — and then you rechecked it and it was found to be less than 180, we report that as less than 180, due to a likely error. We have already covered some of the inclusions and exclusions earlier, so I will not dwell on those, so that we can get to the performance. Over the last 12 months, GLU-06 performance looks like this: just to orient the group, higher is better for performance. The sites over on the left side of the slide are performing at a higher level, and the sites on the right side are performing at a lower level. I would like to call attention to us at the University of Michigan — we are in the middle now. In previous reviews, we were way over on the right side, and we

will go through some of the high performers and high improvers over the course of this review period for the last 12 months.

Please take a look at the slide and see where your institution falls. Does anyone have any questions? In the context of cardiac surgery, hyperglycemia is really challenging to avoid, as we are seeing here with a lot of performances less than 80 or 90 percent. That is due both to the population — there is a high proportion of patients with diabetes — and also to the fact that we are giving cardioplegia that contains high amounts of glucose every so often on bypass, which really can work against us. I am going to move on to the next slide.

Discussion:

Allison Janda (University of Michigan): This next series of slides looks at GLU-06 performance at individual sites, starting with Site A and Site B.

> *Site A Provider*: At Site A, the GLU-06 quality measure is being sent out directly to providers, which means there is more attention to the measure, and that has contributed to the improvement we are seeing.
> *Allison Janda (University of Michigan):* How does it go out to the providers?
> *Site A Provider*: It goes out in two different ways. We also dropped our treatment threshold to 150 mg/dL, and that has helped contribute to the improvement as well.
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> *Site B Provider*: At Site B, we had an impressive change in performance on GLU-06. We treat earlier now, and I was surprised by how early we can treat. When we rolled out our protocol, we initially treated at a blood glucose level of 120 mg/dL, and then we lowered that threshold and treated at 110 mg/dL. Treating means giving insulin. The measure and the protocol draw providers' attention to hyperglycemia.
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> It is something that can be protocolized. Deploying a protocol at your institution can have an impact when it is coordinated with perfusion, pharmacy, and endocrinology — at Site B, all of those stakeholders were involved and helped to improve performance. The big takeaways, anecdotally, were that we started insulin sooner and at a lower glucose level, and that was important. Equally important was coordinating with perfusion: anesthesiologists talked to the perfusionists and understood what the perfusionists were doing, including giving insulin boluses for specific glucose values.
> And that protocol is not rocket science. The big, high-altitude takeaway that I got from switching from not having a protocol to having one is that we start insulin much sooner than you might expect otherwise, and at a much lower glucose level than you might otherwise, knowing that in these cases we are going to be giving cardioplegia, going on bypass, and that the glucose is going to go up at some point.
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> Almost equally important is coordinating with perfusion — getting anesthesiologists to talk to the perfusionists about when they are giving cardioplegia and understanding what the perfusionists are doing. The protocol considers perfusionist-guided actions and anesthesiologist-guided actions. Ultimately, our protocol has an anesthesiologist titrating the insulin infusion, and the perfusionist giving small boluses at specific glucose values or in recognition that the cardioplegia might be contributing to the glucose rise. Those were my high-altitude takeaways at Site B, and I think they led to the change in performance we observed.

Allison Janda (University of Michigan): Yes, Thanks for sharing that.

Ashanpreet Grewal (University of Maryland): Are you handling pre-operative hyperglycemia in a specific way, or is it individualized?

Site B Provider: In pre-op, if a patient is diabetic — regardless of whether the surgery is cardiac surgery — an insulin sliding scale is ordered if the patient is diabetic. This was implemented in mid-2024 or early 2025. Prior to this, the nurse would report the blood glucose and then insulin would be ordered. There is a low ceiling for GLU-06. It is hard to get to 100 percent. It was great to go from about 25 percent to 65 percent, but there will be a point where we max out.

Allison Janda (University of Michigan): That is where the importance of a countermeasure comes in. If you achieve 100 percent on GLU-06, we would not know what is happening with hypoglycemia unless we looked. GLU-07 is designed to flag cases with blood glucose less than 70 mg/dL.

GLU-07 Hypoglycemia Measure and GLU-06 vs GLU-07

Allison Janda (University of Michigan): Next, we will look at GLU-07, which is our hypoglycemia management measure for open cardiac surgery. GLU-07-C is defined as the percentage of adult patients undergoing open cardiac surgery who have any intraoperative blood glucose value less than 70 mg/dL. The timing is from anesthesia start to 15 minutes after anesthesia end.

Success for this measure means either that the lowest blood glucose was maintained at greater than or equal to 70 mg/dL, or that any glucose less than 70 mg/dL was rechecked within 15 minutes and found to be greater than or equal to 70 mg/dL. Inclusions are adult patients undergoing open cardiac surgical procedures, as determined by the cardiac procedure phenotype. Exclusions are patients younger than 18, ASA 6 organ procurement cases, and non-cardiac, transcatheter/endovascular, EP/Cath, and other cardiac procedures. Lower rates on this measure are better, because they represent less hypoglycemia.

Looking at GLU-07 performance across MPOG over the past 12 months, lower values indicate fewer hypoglycemic episodes.

Allison Janda (University of Michigan): On the next slide, we are comparing GLU-06 and GLU-07 performance side-by-side. The orange bars represent GLU-07, and the blue bars represent GLU-06. Even though the intention of GLU-07 was to be a countermeasure — to make sure that striving for excellent hyperglycemia avoidance on GLU-06 did not lead to excessive hypoglycemia — it is not the case that the highest-performing sites on GLU-06 have the highest amount of hypoglycemia. We wanted to make sure that this relationship, or lack of it, was shared with sites as well, because we are all working toward the same overall goal. Any comments on this slide before I move on?

Michael Mathis (University of Michigan): I will just say that it is interesting to see that some sites have pretty high rates. I was surprised to see that there is a good number of sites with over 10 percent of cases flagged. I would be interested to know how many of those are severe episodes — for example, a glucose of 68 mg/dL versus 45 mg/dL would be a big difference. I do not know if it is worth following up in more detail, but that is something I am curious about.
Allison Janda (University of Michigan): Yes, a value of 68 mg/dL versus 45 mg/dL would be a big difference. We have not delved into that specific breakdown yet, but it is a good point.

GLU-08 Hyperglycemia Treatment

Allison Janda (University of Michigan): Alright, we are going to move on to GLU-08, which is the hyperglycemia treatment measure for open cardiac surgery. GLU-08-C is the percentage of adult patients undergoing open cardiac procedures for whom any blood glucose value greater than or equal to 180 mg/dL was either treated with insulin or rechecked and found to be less than 180 mg/dL within 30 minutes.

So, if you have a blood glucose greater than or equal to 180, you have a 30-minute window either to recheck and confirm whether it is truly over 180 — if you think it is spurious — or to treat it. Treatment can be an insulin infusion, an insulin bolus, or subcutaneous insulin. The inclusions and exclusions mirror those of the other cardiac glucose measures: adult open cardiac procedures, excluding patients younger than 18, ASA 6 organ procurement cases, and non-cardiac, transcatheter/endovascular, EP/Cath, and other cardiac procedures.

Looking at GLU-08 performance across MPOG over the past 12 months, performance on GLU-08 is really excellent. There is a lot of very high performance, so even though we are seeing hyperglycemia, it is very frequently either rechecked and found not to be greater than 180, or — more commonly — treated with insulin. Any comments on this performance before I move to the next slide to dissect some of this further?

The next slide shows GLU-06 versus GLU-08 performance. GLU-06 is represented by the dark blue bars, and GLU-08 by the light blue bars. There is an interesting trend as we move down the sites, but GLU-06 and GLU-08 are not necessarily consistent with one another. Some sites may have relatively modest GLU-06 performance but excellent GLU-08 performance, indicating good treatment once hyperglycemia occurs.

Allison Janda (University of Michigan): I want to highlight a few specific sites, starting with Site C.
Site C Provider: At our site, there has been an increased focus on glucose measures in general. Glucose measures are being reported, and that visibility has contributed to improvement. There was a gradual implementation where people became more aware of their performance and started adjusting practice.
Site C Provider #2: From our side, there has also been increased attention because this has become an internal metric that gets reported out and is used for incentive pay. Once that was announced, people started pre-emptively treating hyperglycemia more aggressively.

Ashanpreet Grewal (University of Maryland): For GLU-06, my question is about how we handle pre-operative hyperglycemia in the context of this measure and how we define a ceiling for performance.

> *Allison Janda (University of Michigan):* GLU-06 is measured from anesthesia start to 30 minutes after anesthesia end. We do not take the patient's pre-operative glucose into account within the GLU-06 denominator or numerator. This is not a perfect measure, and that is why the goal is 90 percent and not 100 percent.
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> *Michael Mathis (University of Michigan):* One idea as we refine the measure is for QI champions to receive flags for cases with glucose between 70 and 180 mg/dL at the start of the case, for the purpose of recognizing the baseline glucose and then recognizing glucose values throughout the case — differentiating mid-case glucose from early-case glucose.

Ashanpreet Grewal (University of Maryland): That would help us better define a ceiling for GLU-06 performance and frame our QI interventions.

Allison Janda (University of Michigan): Yes, this would help people frame their QI intervention. We will work on adding the first intraoperative glucose value as a separate flag within GLU-06, to better contextualize performance and help sites understand their starting point.

TEMP-06-C – Hypothermia Avoidance

Allison Janda (University of Michigan): Next, we are going to move on to TEMP-06-C, which is the hypothermia avoidance measure for adult open cardiac procedures. This measure captures the percentage of adult patients undergoing an open cardiac procedure for whom any core temperature at the end of the case is less than 35.5 degrees Celsius, or 95.9 degrees Fahrenheit.

The timing for this measure starts at cardiopulmonary bypass initiation. If a bypass start concept is not present, the phenotype determines the start. The measure end is 30 minutes after anesthesia end. For cases without bypass, the timing is anesthesia end through 30 minutes after anesthesia end.

Success for this measure is defined as the last non-artifact core body temperature being greater than or equal to 35.5 degrees Celsius at anesthesia end. Core temperatures are prioritized. Inclusions include adult open cardiac procedures. Exclusions include patients younger than 18, ASA 6 cases including organ procurement, and non-cardiac, transcatheter/endovascular, EP/Cath, and other cardiac procedures. Looking at TEMP-06-C performance across MPOG over the past 12 months, lower is better, meaning less hypothermia. The goal is not zero percent, because there are clinical scenarios in which patients are intentionally hypothermic, including patients with pulmonary thromboendarterectomy and deep hypothermic circulatory arrest.

The majority of sites perform well on this measure, but we do see variability across institutions.

Allison Janda (University of Michigan): The next slide breaks down flagged hypothermia cases by temperature route. What we see quite clearly is that a substantial proportion of flagged cases are associated with undocumented or poorly mapped temperatures.

This is another situation where it can be very helpful to talk to your local MPOG mapping champion to ensure that your temperature probes and documentation pathways are fully mapped into MPOG. If a temperature is not mapped, it is effectively interpreted by the measure as missing or abnormal.
The breakdown by route also helps us distinguish between true clinical hypothermia versus documentation artifacts.

TEMP-07-C – Hyperthermia Avoidance

Allison Janda (University of Michigan): We will now move on to TEMP-07-C, which is the hyperthermia avoidance measure for open cardiac procedures. This measure evaluates the percentage of adult patients undergoing an open cardiac procedure for whom core temperature was greater than 37.5 degrees Celsius, or 99.5 degrees Fahrenheit, for more than five consecutive minutes while on cardiopulmonary bypass.

The timing for this measure begins at cardiopulmonary bypass initiation and ends at cardiopulmonary bypass termination. If bypass start or end is not present, the phenotype is used. If neither is available, anesthesia end is used as the endpoint.

Success is defined as having less than five consecutive minutes of non-artifact core temperature above 37.5 degrees Celsius between bypass start and bypass end. Core temperature measurements are prioritized.

Inclusions include adult open cardiac surgical procedures requiring cardiopulmonary bypass. Exclusions include patients younger than 18, ASA 6 organ procurement cases, non-cardiac, transcatheter/endovascular, EP/Cath, and other cardiac procedures, and open cardiac cases performed without bypass.

Looking at TEMP-07-C performance across MPOG over the past 12 months, again, lower is better, meaning less hyperthermia. Overall performance has improved.

Allison Janda (University of Michigan): This next slide shows the TEMP-07-C breakdown by flagged reason.

Site B Provider: We have seen meaningful improvement over the last two years. One of the main contributors to this improvement has been the perfusion team's attention to this measure. Perfusionists became much more engaged with rewarming practices, specifically avoiding rewarming at too rapid of a rate. Historically, peak temperature during rewarming was problematic, and this was directly targeted as part of the improvement process.

Tammy Atwood (Henry Ford Health): Can you go back to the temperature graph? The performance was not what I expected to see for our site.

> *Allison Janda (University of Michigan):* If you do not currently have access to your site dashboard, I would recommend reaching out to your local MPOG champion so that you can obtain access and look at your site-specific data in more detail.

BP-07-C – Low MAP Avoidance During Induction

Allison Janda (University of Michigan): We are now going to review BP-07-C, which is the low mean arterial pressure avoidance measure during induction for open cardiac procedures.

BP-07-C is defined as the percentage of adult patients undergoing open cardiac procedures where hypotension for greater than five minutes—defined as a mean arterial pressure less than 55 mmHg—was avoided during the induction period until surgery start.

The timing for this measure is anesthesia start through surgery start.

Success criteria are defined as either:

- Mean arterial pressure remaining at or above 55 mmHg throughout the induction period, or
- Mean arterial pressure falling below 55 mmHg for a cumulative total of less than five minutes during induction.

Inclusions are adult patients undergoing open cardiac surgical procedures as determined by the cardiac procedure phenotype. Exclusions include patients younger than 18, ASA 6 including organ procurement (CPT 01990), and non-cardiac, transcatheter/endovascular, EP/Cath, and other cardiac procedural groups.

Allison Janda (University of Michigan): This is one of the more challenging measures to interpret because it reflects not only anesthetic management but also patient comorbidities, severity of illness, induction technique, and institutional practice patterns. As with other measures, this is not meant to be punitive but to identify opportunities for improvement and consistency in care.

Allison Janda (University of Michigan): Very high performance overall, which is great. Let's stay on this slide for just a minute. I pulled up the definition and the target. Any questions or thoughts here?

And this is the breakdown of flagged cases. This shows arterial line blood pressures versus non-invasive blood pressures. As is most common, these cases have arterial lines. However, they often also have concomitant non-invasive blood pressures running, so a few of these flags could be triggered for that reason.

For those institutions all the way over on the right, there may be something related to the mapping that is coming through as a little odd, where all of the blood pressures are non-invasive at institutions that do quite a bit of cardiac. That is something worth looking into for the mappings at those institutions.

Next Steps

Allison Janda (University of Michigan): As far as next steps, the subcommittee is open to all anesthesiologists and others who are interested in improving cardiothoracic measures. Tammy, thank you so much for being on the call. She is one of the excellent perfusionists at Henry Ford Jackson and was part of our perfusionist working group for development of TEMP-07. We truly want to maintain an inclusive culture here.

Many people are very important in how we are achieving—or not achieving—these measures, and they would have key roles in any quality performance initiatives to improve them.
You do not have to practice at an active MPOG institution to participate. If you leave an institution, you can always continue to come to these meetings. That is perfectly fine.

Our next meetings will be in February 2026, June 2026, and then again in February and November 2026. We use Basecamp as our forum for discussions between meetings, and we will post the redacted slides on the MPOG Archived Events page in the next few days. I will also put a Basecamp post up to announce that the video and slides have been published.

As for other next steps, we will proceed with developing the GLU-14 measure that Ashan presented today. If we do not hear any further objections, it seems that people were very enthusiastic about that earlier in the discussion.

Great. Alright, thank you all so much for your attention and for the engaged discussion throughout the unblinded review today. I hope everybody has a wonderful holiday season.