Anesthesiology Performance Improvement and Reporting Exchange (ASPIRE)

Pediatric Subcommittee Meeting Minutes – March 2, 2026

Attendance:

Peter Bow, MPOG	*Cathie Jones, Boston Children's*
Morgan Brown, Boston Children's	*Rahul Koka, Johns Hopkins*
Robert Brustowicz, Boston Children's	*Eva Lu-Boettcher, UW Health - Wisconsin*
Kate Buehler, MPOG	*Frederick Mansfield, U.S. Anesthesia Partners**
Mei Calabio, MPOG	*Kam Mirizzi, MPOG*
Megan Charette, MPOG	*Viviane Nasr, Boston Children's*
Joseph Cravero, Boston Children's	*Allison Nye, OHSU*
Jurgen de Graaff, Weill Cornell	*Katie O'Conor, Johns Hopkins*
Lucy Everett, Mass General Brigham	*Diana O'Dell, MPOG*
Marla Ferschl, UCSF	*RJ Ramamurthi, Lucile Packard Children's**
Jackie Goatley, University of Michigan	*Nirav Shah, MPOG*
Kirsten Groody, University of Michigan	*Ruchika Sharma, University of Virginia*
Ruchika Gupta, University of Michigan	*Brady Still, UChicago Medicine*
Melanie Herren, MPOG	*Meridith Wade, MPOG*
John Huntington, Helen Devos Children's	*Theodora Wingert, UCLA*

**Denotes participant from non-active MPOG Institution*

Start: 1601

Announcements & General Updates

Minutes from December 1, 2025 meeting approved - minutes and recording posted on the MPOG website for review

---

Leadership update

- Dr. Eva Lu-Boettcher (UW Health - Wisconsin) was introduced as the new Pediatric Subcommittee Vice Chair. Morgan Brown noted Eva's prior involvement in MPOG measure reviews and thanked her for stepping into the role.

Pediatric participation in MPOG

- Two additional pediatric hospitals have joined MPOG: Riley Children's in Indianapolis and UCSF Benioff Children's, Oakland.
- The committee noted that MPOG now includes 32 pediatric hospitals, reflecting continued growth in pediatric participation and broader national representation across both academic and community pediatric practices.

2026 MPOG Pediatric meeting schedule

- The Pediatric Subcommittee plans to meet three times by Zoom in 2026: March, June, and December.
- The committee also expects to hold an in-person pediatric gathering during the MPOG Retreat at ASA, with a virtual option again available, consistent with the meeting format used in late 2025.

2026 Measures Requiring Formal Review

- Four pediatric measures are scheduled for literature review and update:
  1. June Meeting
     - TEMP-04 – Intraoperative Normothermia
     - PAIN-01– Multimodal Analgesia
  2. December Meeting
     - SUS-06 – Low Fresh Gas Flow, Induction
     - FLUID-02 – Minimizing Colloid Use
- Main reviewers must practice at an active MPOG site and will use an MPOG review template.
- Contributions will be recognized on the MPOG website and at the annual meeting.
- Volunteers are encouraged, especially where there is strong clinical interest.

AKI-03 Pediatric Cardiac Measure Update

- AKI-03-Peds has been released on the MPOG QI Dashboard as the first pediatric cardiac-specific MPOG measure.
- The measure applies existing acute kidney injury logic to a cohort of pediatric patients undergoing cardiopulmonary bypass. Key exclusions include:
  - Patients not on bypass
  - Patients with preexisting renal failure
  - Patients without a baseline creatinine
  - Patients without a postoperative creatinine

Discussion

- Morgan Brown reviewed site-level variation in AKI rates and noted that the data demonstrate meaningful variation across pediatric cardiac centers of different sizes. The committee discussed this as an important early step in pediatric cardiac quality measurement, especially given that adult centers have more established AKI prevention efforts and bundles than pediatric centers.
- AKI-03 is expected to be a future discussion topic for the pediatric cardiac subgroup.

Measure Development – Patient Blood Management (PBM)

Background

PBM and postoperative pain management were previously identified by the committee as the two highest-priority topics for new pediatric measure development. The committee has not yet started the postoperative pain build and devoted this meeting primarily to PBM.

Rationale

Morgan summarized the three major domains commonly described in patient blood management literature:

1. Screening for, diagnosing, and treating anemia

2. Minimizing surgical, procedural, and iatrogenic blood loss
3. Managing coagulopathic bleeding

The subcommittee chose to begin with the **anemia domain**, since preoperative anemia identification and treatment are considered foundational elements of blood management programs.

Current PBM concept under development

- The group is exploring a measure focused on identifying pediatric patients undergoing elective major non-cardiac surgery who are at meaningful risk of transfusion and therefore may benefit from earlier identification and treatment of preoperative anemia.
- The intended use case is a departmental or institutional quality metric that helps sites identify potentially modifiable anemia in advance of elective surgery.

Preliminary Cohort Development

MPOG reviewed approximately one year of pediatric data to identify patients at high risk of transfusion during elective non-cardiac surgery.

Initial exclusions included:

- Cardiac patients
- MRI-only or minimal procedural cases
- Endoscopy, bronchoscopy, and cystoscopy
- Lung transplant
- Short-duration cases less likely to reflect clinically meaningful intraoperative blood loss

The pediatric build used aspects of the adult major non-cardiac surgery phenotype, but the minimum case duration threshold was increased from 30 minutes to 60 minutes.

The preliminary cohort included approximately 77,000 cases across 71 institutions, with more than 3,000 pediatric red blood cell transfusions, corresponding to an approximate transfusion rate of 4.6%.

Discussion

Clarifying the purpose of the metric

- Ruchika Gupta (University of Michigan) asked how the measure would function if the intended intervention is something that must occur 4 to 6 weeks before surgery, such as iron optimization.
- Morgan Brown (Boston Children') emphasized that the metric is not intended simply to measure anemia prevalence, but rather to identify a subgroup of patients at high enough transfusion risk that preoperative anemia screening and treatment may be clinically meaningful.
    - **Decision:** The committee agreed that the metric is best understood as a process-oriented or informational quality measure rather than a direct measure of "preventable transfusion."

Neonates and young infants

The committee discussed whether neonates should be excluded because they may not fit the intended PBM model. Concerns included physiologic anemia in infancy, limited opportunity for preoperative iron-based optimization, and the fact that neonatal transfusions are often driven by hemodynamic instability or NICU/surgical decision-making rather than standard anemia thresholds.

- Joseph Cravero (Boston Children's) noted that neonates may be transfused preoperatively based on multidisciplinary decisions in ways that differ substantially from older pediatric patients.
- Cathie Jones (Boston Children's) suggested reviewing the procedures represented in the youngest age groups to help determine whether those cases are appropriate for inclusion.
- Ruchika Sharma (University of Virginia) commented via chat that most surgical neonates may be transfused more for hemodynamic instability than pure hemoglobin targets.
    - **Decision:** Emerging consensus favored excluding or at least separately considering patients under 30 days of age.

Emergency cases and highest-acuity patients

The committee discussed whether emergency cases and ASA 5/6 patients should be removed from the cohort to improve actionability.

- Morgan Brown noted that many ASA 5/6 cases may already overlap with emergency cases and may not be realistic candidates for the type of preoperative optimization this measure is intended to support.
- Ruchika Gupta suggested via chat that the team specifically evaluate what the cohort looks like after excluding emergency cases.
- Ruchika Sharma also asked via chat whether any of the ASA 5 cases were on ECMO, reinforcing concern that the sickest patients may not be appropriate targets for this metric.

Which populations are modifiable?

The committee discussed whether transplant, trauma, burn, oncology, hematologic, and chronic disease populations are too clinically complex or insufficiently modifiable for this measure.

- Morgan Brown noted that transplant cases represented one of the largest transfused groups in the preliminary cohort and questioned whether transplant patients are realistic candidates for anemia optimization pathways.
- Eva Lu-Boettcher raised concern that oncology and hematologic populations may skew the data because their anemia is often driven by chronic inflammation, marrow pathology, or protocolized inpatient care rather than a short-term modifiable deficiency.
- Eva later added via chat that less modifiable populations, including active malignancy, hematologic disorders, oncology, and chronic disease, may need to be excluded because their anemia is less responsive to short-term interventions such as IV iron therapy.
    - Cathie Jones agreed via chat with that concern.
    - **Decision:** The committee generally agreed that the measure should prioritize populations in which preoperative intervention is realistic and useful.

Naming and framing the metric

- Theodora Wingert (UCLA) commented via chat that the goal seems to be "preventable, unnecessary" RBC transfusion and suggested the measure may need to be named in a way that

makes that concept clearer. She also noted that neonates may not be good candidates for iron infusions but may still be candidates for other PBM interventions such as PCC or coagulation optimization.
    - Morgan Brown agreed with the conceptual concern but clarified that this specific measure is focused on anemia optimization, not the broader coagulation-management arm of PBM.

Intraoperative vs perioperative transfusion

- Robert Brustowicz (Boston Children's) asked whether the metric is trying to reduce only intraoperative transfusions and whether it might simply shift transfusions to the preoperative setting without a true net benefit.
- Morgan Brown noted that MPOG currently has its strongest data for intraoperative transfusions, which is why the build has centered there.
- Meridith Wade added that MPOG can also capture some transfusion data in the four hours before anesthesia start, which may help inform future refinement of the metric.

Hematocrit availability and timing

The team found that approximately 94% of patients in the preliminary cohort had a preoperative hematocrit. The committee discussed how recent that hematocrit must be to be meaningful.

- Cathie Jones (Boston Children's) stated that values older than one month are difficult to interpret and likely should not be relied upon.
  o The group generally supported using a recent hematocrit, likely within the prior month, as part of the measure logic.
  o Ruchika Gupta (University of Michigan) asked whether same-day labs are captured as preoperative values; Morgan Brown confirmed that values drawn before anesthesia start would qualify.

Procedure-based definition of high-risk surgery

- Cathie Jones (Boston Children's) asked how the measure will determine which surgeries are considered high-risk for transfusion and whether sites will be able to understand what procedures are included.
    - Morgan Brown explained that the current approach uses age, ASA class, anesthesia CPT-based logic, and case duration to define a high-risk cohort.
    - She also noted that once the cohort is refined, the team can review the most common CPT codes represented in the measure to confirm that the included cases align with clinical expectations for major pediatric surgery.

Additional potential data elements

- Theodora Wingert (UCLA) asked via chat whether MPOG has access to first postoperative hemoglobin values.
    - Meridith Wade (MPOG) responded via chat that this was not pulled for the current analysis but is available in MPOG data.
    - This may be useful for future PBM-related exploratory work, though no decision was made to incorporate postoperative hemoglobin into the current build.

Narrow vs broad cohort strategy

- Nirav Shah (MPOG QI Director) suggested that if the group continues to struggle with defining a broad “major pediatric surgery” cohort, it may be easier to start with one or two narrow service lines or procedure groups, similar to approaches previously used in other MPOG subcommittees. Example service lines mentioned included spine surgery and major bowel surgery.
    - Morgan Brown (Boston Children’s) agreed this may be the best fallback strategy if the current broader approach proves too heterogeneous, though she noted pediatric sample sizes remain a challenge.

Decision

- Continue development of the PBM/anemia measure concept.
- The measure should prioritize actionability and modifiability rather than simply capturing the highest-risk or most transfused patients.
- Patients under 30 days of age will likely need to be excluded or analyzed separately.
- A recent preoperative hematocrit should likely be required, with approximately one month discussed as a reasonable starting threshold.
- The committee favors first using this metric as an informational or departmental dashboard measure rather than immediately deploying it in feedback emails.
- Additional cohort refinement is needed before formal implementation.

Next Steps

Morgan Brown and the coordinating team will refine the preliminary PBM cohort using feedback from this discussion.

The team will specifically explore the impact of excluding:

- Neonates / patients under 30 days
- Emergency cases
- ASA 5/6 patients
- Less modifiable populations where feasible

The team will further review:

- Common CPT codes represented in the cohort
- Whether case duration thresholds should be adjusted further
- Whether diagnosis- or phenotype-based exclusions are feasible
- Whether transfusions in the four hours before anesthesia start should be incorporated into future iterations
- If the broad cohort remains difficult to define, the group may pivot to a narrower, service-line-based pilot measure.

PBM measure refinement will return for continued discussion at a future pediatric meeting.

Adjourned: 1653

Full Transcript

--

00:03:49 – Morgan Brown (Boston Children's):
All right, maybe a few more people will keep trickling in, but we might as well get started. Thanks, everybody, for joining today's spring MPOG Quality and Pediatrics meeting. We'll begin with a few announcements and updates, review AKI-03, and then spend most of our time discussing the new measure work based on our last group discussion on pediatric anemia. I'd especially like your input on what we've developed so far and how we should refine it to make the measure as useful as possible.

00:04:37 – Morgan Brown (Boston Children's):
First, if you do not already know her, this is Dr. Eva Lu-Boettcher, a pediatric anesthesiologist in Wisconsin, who has graciously agreed to serve as the new vice chair for the committee. She has already been very involved with MPOG, including participating in multiple measure reviews. Thank you again, Eva.

00:05:08 – Eva Lu-Boettcher (UW Health - Wisconsin):
Thanks a lot.

00:05:11 – Morgan Brown (Boston Children's):
We're also very excited that pediatric participation in MPOG continues to grow. Two more pediatric hospitals—Riley Children's in Indianapolis and UCSF Benioff Children's—are now on board, which is great. We're looking forward to having new members on this committee from both institutions.
There are now 32 pediatric hospitals in MPOG, and I think we're starting to get a very nice representative sample across the country. We now have participation from both smaller community practices and many larger academic institutions as well.

00:06:04 – Morgan Brown (Boston Children's):
We also wanted to let everyone know, so you can plan ahead a bit, that we are going to have three Pediatric Subcommittee meetings this year, all by Zoom. This is the March meeting, then we'll have one in June and another in December.
As you all know, in March we also have SPA, CCAS, and the pain group meetings, so we're not planning anything specifically in person there. But I know I'll be there, and Eva probably will be as well, so if you have questions or want to talk about MPOG or pediatric quality work, please come find us.
Last year, we also had a really nice in-person gathering at the MPOG retreat during ASA. It overlapped with the SPA meeting, but it was valuable to be able to meet in person and interact with people we usually only see on Zoom. We'll be doing that again this year. There was also a Zoom option last year, and people joined that way as well, so if you can't attend in person, you should still be able to participate remotely.

00:07:33 – Morgan Brown (Boston Children's):
As part of our regular MPOG work, we also need to make sure we stay current with measure reviews. This year, we would like to complete four measure reviews, and we are looking for volunteers. If no one volunteers, you'll have to listen to a cardiac anesthesiologist like me review pain measures, which might be a little painful.

If there's a topic you're especially interested in, this is a great chance to stay current with the literature. If it's something you haven't worked on before, it's also a good opportunity to learn something new. We're hoping to review at least one measure at the June meeting, and hopefully two.

00:08:22 – Morgan Brown (Boston Children's):

I also wanted to mention that AKI-03 has now been released. It came out on Basecamp, and this is the first measure we've developed specifically for pediatric cardiac patients.

We started by building a cohort of children undergoing cardiopulmonary bypass and then applied the existing acute kidney injury logic to that group. There are many exclusions, most notably patients who are not on bypass, patients who came in with renal failure, and patients who did not have either a baseline creatinine or a postoperative creatinine. Unless there is a site-level data issue, most pediatric cardiac patients would be expected to have those data elements.

Meridith pulled data to show site variation, and I think this is a good example of a metric with substantial variation. The orange-yellow dots indicate center volume, and there is a wide range of pediatric cardiac volume represented in MPOG. The most common range in this dataset seems to be around 100 to 300 cases, which probably reflects many institutions. There are also some very high-volume centers represented.

You can see there is considerable variation in AKI rates, and that makes this a very interesting measure. We now have a pediatric cardiac subgroup, and although we have not yet announced dates for those meetings, I expect this will be an important discussion topic. Adult centers have focused on AKI prevention for a long time and often use AKI bundles, but I don't think that has fully worked its way into pediatric practice yet.

If anyone has questions, please feel free to put them in the chat, interrupt me, or raise your hand.

00:11:00 – Morgan Brown (Boston Children's):

What we really wanted to spend most of our time on today is the development of new pediatric QI measures. After a lot of discussion over the last year, we identified two topics that seemed to be of greatest interest to the group: patient blood management and postoperative pain management.

We have not yet started the postoperative pain build, so we will likely discuss that either at the next meeting or at the MPOG retreat in October. Today, we want to walk through what we've done so far on patient blood management and get your input.

Blood management is obviously a large topic. Susan Goobie previously joined us and talked about the principles of patient blood management and what she thought would be useful to institutions working on this topic. When you look across the literature, there are three recurring themes: screening for, diagnosing, and appropriately treating anemia; minimizing surgical, procedural, and iatrogenic blood loss; and managing coagulopathic bleeding to improve outcomes.

Different authors phrase those ideas differently, but conceptually I think of patient blood management as something like ERAS for transfusion. It's a more holistic way of organizing principles we already know are important. Each component matters, and focusing on just one may not be enough. But institutions still need a practical way to act on those ideas, so we decided to focus first on the anemia component, since screening for and diagnosing anemia is really one of the cornerstones.

00:13:17 – Morgan Brown (Boston Children's):

When you look more closely at the guidelines, they recommend diagnosing and treating anemia at

least three to six weeks before elective surgery so there is time to intervene meaningfully. They also discuss postponing elective major surgery in high-risk patients in order to optimize them first.
The problem is that there is not much clarity on exactly what “high risk” means in pediatrics. Some authors just say elective surgery, while others say elective major surgery. So before developing a metric, we felt we first had to define which pediatric patients are actually high risk enough that preoperative anemia optimization would make sense.

00:14:01 – Morgan Brown (Boston Children’s):
What we did was try to identify patients at high risk of blood transfusion during elective non-cardiac surgery. The idea was that if we can identify which children actually receive transfusions during surgery, we can define a cohort of patients at meaningful transfusion risk and therefore potentially amenable to intervention.

00:14:42 – Morgan Brown (Boston Children’s):
At the start of this work, there were 33 million cases across 78 institutions, so we added several inclusion and exclusion criteria to make the analysis more manageable. We limited the review to about one year of data. We excluded cardiac patients because that population gets complicated quickly, particularly with cyanosis and different transfusion thresholds.
We also excluded patients whose transfusions were unlikely to relate to what happened during the procedure itself—for example, MRI-only cases, tonsillectomy patients who only got intubated, block-only cases, endoscopy, bronchoscopy, cystoscopy, and lung transplant. We based some of that on the adult major non-cardiac surgery phenotype, which we were trying to emulate.

00:24:26 – Ruchik Sharma (University of Virginia) (via chat):
Did this include transplant anesthesia, neuroanesthesia?

00:25:00 – Meridith Wade (MPOG) (via chat):
Yes, it included both.

00:14:42 – Morgan Brown (Boston Children’s):
The adult phenotype requires a case duration of at least 30 minutes, but we changed that to 60 minutes because if the case is shorter than an hour, it seems less likely that a transfusion would be due to something happening during the case and more likely due to some unusual circumstance.
That left us with about 77,000 cases across 71 institutions. Within that cohort, there were over 3,000 pediatric cases with red cell transfusion, which is a rate of about 4.6%. In other words, about 1 in 20 patients in this group were transfused, which is actually fairly high given how infrequently pediatric patients are generally transfused.

00:16:41 – Morgan Brown (Boston Children’s):
We then tried to refine the cohort further so that it would better represent a truly high-risk population. One question is what to do with babies younger than 30 days. Do people think we can realistically intervene on anemia in that group, or would including them just dilute the metric? Ideally, in a preoperative anemia clinic, treatment would involve oral or IV iron. We are not talking about transfusing children before they come to the OR.
Does anyone have thoughts on that?

00:18:06 – Ruchika Gupta (University of Michigan):
What about the physiologic anemia we also see in infants? That drop is expected and happens around the first few months of life.

00:18:16 – Morgan Brown (Boston Children's):
Yes, that's a good point. Are you suggesting excluding babies younger than around 3 months because there may not be much we can do? Or do you think some would still be candidates for treatment with iron?
00:19:03 – Joseph Cravero (Boston Children's):
I think the neonatal group is different. A lot of those children may be transfused to a certain hemoglobin or hematocrit before surgery based on decisions made by the NICU team and the surgeons. That is a very different situation from older children.
So I still think the question is interesting, but I wonder whether neonates should be considered separately because the mechanism is so different. We are usually not transfusing a 2-year-old before surgery based on anemia alone, but a former 28-week infant may very well receive a transfusion before surgery based on the judgment of the care team and surgeon.
00:20:44 – Morgan Brown (Boston Children's):
Yes, exactly. That is why we wanted to talk this through as a group. We are trying to develop a metric that helps prevent transfusion through earlier identification and treatment of anemia. If a population is already likely to be transfused preoperatively, that does not really fit the concept we are trying to measure.
What we are imagining is a patient blood management approach where a child is seen in clinic, gets a CBC, is found to be anemic, and then the team decides to delay an elective surgery in order to treat that anemia. I'm not sure there are many 2-week-olds in that category. Most surgeries at that age probably need to happen.
00:21:43 – Cathie Jones (Boston Children's):
My thought is that excluding children under one month seems reasonable. But I also wonder whether it would help to look at what surgeries are actually being done in that one-month-to-one-year age range. Seeing those procedures might help answer whether physiologic anemia really matters for this metric.
00:22:11 – Morgan Brown (Boston Children's):
We could definitely try to look at that. The challenge is that when you have this much data, looking at procedures becomes difficult because there are so many CPT code combinations. It makes it hard to develop isolated exclusions. But yes, we could look at the cases under one month to better understand them. Even so, our initial thought was to exclude those patients.
00:22:51 – Ruchika Gupta (University of Michigan):
I think I'm also trying to get clearer on exactly what this metric is trying to achieve. It sounds like we are looking for patients who should have had some intervention before the day of surgery—iron or some other treatment—based on information available weeks earlier.
00:24:26 – Ruchik Sharma (University of Virginia) (via chat):
Did this include transplant anesthesia, neuroanesthesia?
00:25:00 – Meridith Wade (MPOG) (via chat):
Yes, it included both.
00:22:51 – Ruchika Gupta (University of Michigan):
So would the metric ultimately be showing that we knew six weeks ago that a child had a low hemoglobin and then still ended up transfusing them during surgery? Is the goal to identify missed

opportunities for preoperative optimization and push pre-op clinics or surgical teams to change practice?

00:23:51 – Morgan Brown (Boston Children's):

Yes, that's essentially the idea. Simply measuring how much anemia exists in the population does not mean much on its own. We are trying to identify a patient population at meaningful risk of transfusion, with the idea that if you corrected anemia in that group beforehand, you might avoid some transfusions.

That is how I interpret what the patient blood management literature is getting at. In adults, this has existed for a long time. Patients coming for something like a hysterectomy may be found to be significantly anemic in pre-op clinic, receive IV iron, and then avoid transfusion. We are trying to identify which pediatric population might fit that same model.

Looking at anemia in children coming for ear tubes would not be useful, because transfusion would almost never be relevant in that setting. We need a population where transfusion is a plausible perioperative risk.

00:25:27 – Morgan Brown (Boston Children's):

Another question is what to do with the highest-acuity patients. When we look at ASA class, the patients being transfused often fall into ASA 5 or 6. Do people think those are realistic candidates for intervention? My hope is that many of those patients would already drop out if we exclude emergencies, but I'm still wondering whether it makes sense just to remove ASA 5 and 6 altogether. Any thoughts?

00:32:22 – Ruchik Sharma (University of Virginia) (via chat):

I feel most surgical neonates get transfused more for hemodynamic instability than pure Hb targets… putting myself out there!

00:26:25 – Morgan Brown (Boston Children's):

We also started looking at surgical specialties. The largest group receiving transfusion in this non-cardiac cohort was transplant—not cardiac or lung transplant, but kidney, small bowel, and liver.

That raises another question: do people think anemia optimization is relevant for transplant patients? Would those patients realistically be brought in and treated in advance for anemia? Or is that too complex a population for this type of metric?

Similarly, the second major group that stands out is trauma and burn patients. Do people think those are populations where meaningful intervention is possible, or are they also poor candidates for this kind of measure?

00:34:08 – Ruchik Sharma (University of Virginia) (via chat):

Were any of the ASA 5s on ECMO?

00:28:09 – Morgan Brown (Boston Children's):

I see that Theodora put in the chat, "I understand the goal—preventable unnecessary RBC transfusion. It may be helpful to name it in a way that gets the idea across. Neonates may not be candidates for iron infusions, but they may be candidates for PCC and other agents to optimize coagulation."

I completely agree with that point. The only challenge is that coagulation optimization really belongs to the third pillar of patient blood management, whereas this particular metric is focused on the anemia component. So yes, neonates may be candidates for other types of blood management interventions, but that would be a different metric concept.

What we are really trying to do here is define a population that institutions can identify and potentially optimize, not necessarily prove that every transfusion was preventable.

00:35:12 – Theodora Wingert (UCLA) (via chat):

I understand the goal to be "preventable, unnecessary" RBC transfusion. Maybe it would be helpful, semantically, to name it in a way that gets this idea across. Neonates may not be candidates for iron infusions, but would be or are candidates for PCC and other agents to optimize coagulation.

00:29:22 – Theodora Wingert (UCLA):

Yes, that makes sense. I just think that many people looking at the data may not interpret it that way. It is hard to classify transfusions as preventable.

00:29:58 – Morgan Brown (Boston Children's):

I agree. It is very hard to know which transfusions are truly preventable. If a surgeon causes enough bleeding, transfusion may be unavoidable. But the idea is that if the patient begins in a better place, then maybe a smaller amount of blood loss would not push them to transfusion.

So yes, this measure depends on accepting the basic patient blood management premise that treating anemia is probably good for the patient and may also decrease transfusions. In cardiac surgery, for example, there has been debate because bypass itself causes so much hemodilution that some argue preoperative anemia matters less. I'm not sure I completely believe that, but those arguments do exist.

00:31:13 – Morgan Brown (Boston Children's):

As we continued looking at the data, a few other patterns emerged that seemed sensible. Patients who were transfused tended to have longer surgeries. They also tended to be smaller children. And, not surprisingly, they had lower hemoglobin and hematocrit levels than children who were not transfused.

00:32:01 – Robert Brustowicz (Boston Children's):

Are we trying to eliminate only intraoperative transfusions? Could this just shift transfusions to the preoperative setting without producing any real net gain?

00:32:19 – Morgan Brown (Boston Children's):

That's a very good question. Unfortunately, because of how MPOG is currently built, we have detailed data about intraoperative transfusion, but not the same level of detail about preoperative or postoperative transfusions. So from a measurement standpoint, we are mainly limited to intraoperative transfusions.

That said, the rates we are seeing are very similar to what has been reported in the literature, which suggests the data are representative. Conceptually, patient blood management is about avoiding transfusion overall, but the measurable endpoint here would be intraoperative transfusion.

00:33:14 – Meridith Wade (MPOG):

We do have some transfusion data in the four hours before anesthesia starts, so for some cases we can capture transfusions that overlap into the OR period. If the group wants to limit the metric strictly to intraoperative transfusions, we can do that, or we could consider including that perioperative window as well.

00:33:38 – Robert Brustowicz (Boston Children's):

That would matter, because some ASA 5 patients may be transfused in anticipation of the OR.

00:33:45 – Morgan Brown (Boston Children's):

Yes, exactly. That is one reason I was considering excluding ASA 5 patients altogether.

00:34:07 – Morgan Brown (Boston Children's):
We also looked at how many patients in this preliminary cohort had a preoperative hematocrit, because that was an important question for the feasibility of the measure. About 94% actually did have a preoperative hematocrit, which was encouraging.
That led to another question: how recent does that hematocrit need to be in order for us to believe it reflects the patient's preoperative status? If it was drawn more than a month ago—or certainly six months ago—I'm not sure how useful it is. But if it was within the last month and showed anemia, I think that is probably meaningful.
Does anyone have thoughts on that?
00:36:08 – Cathie Jones (Boston Children's):
I think if it was not within the past month, it would be hard to judge. I would not put much trust in an older value.
00:36:23 – Ruchika Gupta (University of Michigan):
I had a question about the same-day hematocrit values. At our institution, little kids often come in, get an IV, and then we send a hematocrit before surgery. Are those definitely being counted as preoperative values?
00:36:41 – Ruchika Gupta (University of Michigan) (via chat):
Can we eliminate emergency cases to see what the numbers look like? That might help with decision making.
00:36:46 – Morgan Brown (Boston Children's):
Yes, those should all be values obtained before anesthesia starts.
00:36:52 – Ruchika Gupta (University of Michigan):
Okay.
00:36:58 – Morgan Brown (Boston Children's):
So there must be many institutions where that is standard workflow. We do not do it that often here, but clearly a lot of patients in the dataset do have those labs.
00:37:10 – Morgan Brown (Boston Children's):
So after looking through all of this, the basic idea would be to create a metric that measures the rate of anemia in patients older than 30 days who are undergoing elective major non-cardiac surgery, who have a transfusion risk of at least 5%, and who also have a recent hematocrit available.
The concept is that these should be patients identified through preoperative screening, with the opportunity to intervene before they come for their elective surgery.
After all the earlier meetings and discussion that led us here, how do people feel about that? Do you think that would be useful?
00:38:13 – Cathie Jones (Boston Children's):
Would sites be the ones choosing that 5% transfusion-risk threshold, or would that be built into the measure?
00:38:21 – Morgan Brown (Boston Children's):
That threshold would be built into the measure. We were trying to think practically about what it means to ask surgeons or institutions to delay or cancel surgery in order to optimize anemia. We wanted a transfusion risk high enough that doing so would feel justified. A 5% risk, which is about 1 in 20 patients, seemed like a meaningful threshold.

We could lower it, but if we do that, we will include many more anemic patients for whom delaying surgery may feel much less appropriate.

00:39:00 – Cathie Jones (Boston Children's):

That makes sense. I think my question is more how the metric would determine which procedures have a transfusion risk greater than 5%. Is that based on institutional history, MPOG-wide data, CPT codes, or something else?

00:39:24 – Morgan Brown (Boston Children's):

It would be based on the criteria we discussed: age, ASA class, specific anesthesia CPT codes, and case duration. Those factors together would define a high-risk cohort based on existing MPOG data.

It is also broadly consistent with the recent paper from Susan Goobie and David Faraoni in BJA, published in January, where they looked at NSQIP data and found similar transfusion risk factors.

00:40:14 – Cathie Jones (Boston Children's):

Do we actually have a list of those CPT codes, though? Because people may want to know what procedures are being included.

00:40:20 – Morgan Brown (Boston Children's):

That is where things get tricky. Procedure coding gets complicated very quickly. For example, you can have multiple different CPT variations for what feels like the same general surgery, and then the question becomes how to group them in a meaningful way.

We do have reasonably good data on surgical CPT codes, though not every institution submits them equally rigorously. Once we get closer to a final cohort, we can definitely identify the most common surgical CPT codes represented so that people have a clearer sense of what procedures are driving the metric.

But in general, MPOG usually builds metrics by starting with a broad cohort and removing patients through exclusions rather than by starting from a short list of approved procedure codes.

00:41:03 – Theodora Wingert (UCLA) (via chat):

Do we have first postoperative hemoglobin?

00:41:34 – Cathie Jones (Boston Children's):

Yes, I understand that. I'm just thinking about how people may react if they feel they are being judged on cases where they would not have expected a transfusion and therefore would not reasonably have delayed surgery.

00:41:46 – Meridith Wade (MPOG) (via chat):

I didn't pull that data for this, but we definitely have it.

00:41:57 – Theodora Wingert (UCLA) (via chat):

Reacted to "I didn't pull that data for this, but we definitely have it" with ❤️

00:42:03 – Morgan Brown (Boston Children's):

Exactly. That's why I think this metric is more useful at the institutional or departmental level. It is less about second-guessing a single case and more about making sure a department is monitoring how much anemia exists among children coming to major surgeries.

00:42:13 – Theodora Wingert (UCLA) (via chat):

Thanks, Meridith!

00:42:52 – Meridith Wade (MPOG):
I think we may want to start by placing this measure on the dashboard as an informational departmental measure only, rather than including it immediately in feedback emails. That would allow us to vet it over time and look at departmental performance before deciding whether to use it more broadly.
00:43:19 – Morgan Brown (Boston Children's):
Eva also put in the chat that we might consider removing patients with active malignancy or hematologic disorders, which is a fair point. We would just need to see how feasible that is. We do have some comorbidity phenotypes available, but I am not sure whether we can reliably determine from the data whether certain surgeries are associated with active cancer, for example.
00:44:07 – Eva Lu-Boettcher (UW Health - Wisconsin):
Yes, I think those populations may skew the data. If you think about oncology patients, for example, they often undergo smaller procedures like line placements but are transfused relatively more frequently than the general pediatric population. At the same time, the kinds of interventions we are talking about may not be especially modifiable in that group.
A lot of those children are transfused on the floor, so they may not even be anemic when they come to the OR. They may also have different transfusion criteria that are not dictated by anesthesiology. And many of their procedures are not emergent, so they would not necessarily be excluded on urgency alone, and they are not always ASA 4 or 5 either. So I think they are a particularly tricky population for this metric.
00:44:56 – Morgan Brown (Boston Children's):
Yes, that makes sense. Bone marrow procedures are another example of something that occurs frequently in those populations. Part of the reason we chose an anesthesia duration threshold of one hour was to eliminate some of those smaller procedures without having to rely too heavily on comorbidity exclusions.
Instead of excluding all malignancy, it may make more sense to increase the required case duration, because the goal is really to focus on procedures where there is enough physiologic change or blood loss that the transfusion risk reflects the situation we are actually trying to prevent.
00:45:55 – Eva Lu-Boettcher (UW Health - Wisconsin):
Right. And that is what is interesting about the paper you mentioned from Susan. The highest-morbidity, highest-mortality populations are often also the least modifiable. The patients we can probably intervene on most effectively are the anemic patients who are not necessarily the ones undergoing the most complicated, highest-risk surgeries.
So part of the question becomes whether we want this metric to focus on the population with the highest morbidity and mortality impact, or the population in which we can realistically make a difference from an anesthesia or perioperative care standpoint.
00:46:50 – Morgan Brown (Boston Children's):
Exactly. Patients who receive transfusions certainly have higher morbidity and mortality, although it is hard to separate whether that reflects the transfusion itself or simply the fact that they are sicker. People who are very focused on blood conservation would argue the transfusion matters, but it is difficult to untangle.

Still, we can look more closely for things like port placements and line placements to make sure they are not slipping into the cohort. We can also increase the anesthesia duration threshold if needed. That may be the simplest way to eliminate many of these short, protocol-driven cases without having to rely on diagnosis-based exclusions.

00:48:00 – Morgan Brown (Boston Children's):

Any other thoughts? I hope this ends up being useful. It is definitely a more theoretical and complicated metric than some of our others. It is really a process metric focused on anemia, where the implied intervention happens before surgery. That makes it harder to define cleanly, and you can see why the adult group may not have tackled it yet either.

00:48:46 – Cathie Jones (Boston Children's):

The only other thing I would add is that in oncology patients, a number of smaller procedures often get bundled together, so what looks like several minor procedures can become a much longer case and still involve transfusion.

00:48:58 – Morgan Brown (Boston Children's):

Yes, that is a very good point, and we should look at that as well.

00:49:11 – Nirav Shah (MPOG):

One thing you might consider, if you continue having trouble getting to the right cohort, is doing something that we have done in the cardiac and obese subcommittees. Instead of trying to capture a broad population, you could build the measure around one or two specific service lines or procedure groups—something like spine surgery or major bowel surgery.

Sometimes it is much easier to build a measure around a very narrow set of procedures where the concept clearly applies. That can become a kind of proof of concept. If you are doing the right thing for one service line, you can expand to others later. That may be more practical than trying to create a complicated algorithm that still never fully captures the intended patient population.

00:50:26 – Eva Lu-Boettcher (UW Health - Wisconsin) (via chat):

The other thing is to consider excluding less modifiable populations—cohorts with active malignancy and hematologic disorders, including oncology or chronic disease patients. Their anemia is related to chronic inflammation or marrow pathology, making it less responsive to short-term interventions such as IV iron therapy.

00:50:38 – Cathie Jones (Boston Children's) (via chat):

Reacted to Eva Lu-Boettcher's comment with 👍

00:50:38 – Morgan Brown (Boston Children's):

Yes, we could certainly try that. One of the challenges in pediatrics is that our overall numbers are smaller to begin with, and the number of transfused patients is also relatively low. But if this broader strategy does not work, that may ultimately be the approach we need to take—start with a narrower population and build outward.

We would still need to define what constitutes major surgery in pediatrics, which has not really been established, but I do think that narrow-to-broad approach makes sense as an alternative strategy.

00:51:30 – Nirav Shah (MPOG):

Yes, exactly. It may simply help you get to an initial workable population more quickly.

00:51:41 – Morgan Brown (Boston Children's):
I agree. I will say that our first pass felt encouraging because we did get to roughly a 5% transfusion rate, which seemed meaningful. I think the next step will be to test some of the changes we discussed today and see how they affect the cohort. We can also review the CPT codes represented in that population, as Cathie suggested, so we better understand what types of procedures are included. When we looked at the CPT codes in some earlier iterations, they generally did make sense for major surgery, so I think there may simply be more than one reasonable way to approach this.
00:59:53 – Ruchika Gupta (University of Michigan) (via chat):
If we are looking at something that is modifiable four to six weeks before surgery with iron, how will the metric work to help us achieve this?
00:52:35 – Morgan Brown (Boston Children's):
Thank you again to everyone for your input and for spending time thinking this through. I know it is a complicated topic. We look forward to seeing you all in June, and hopefully some of you at the MPOG meeting in a few weeks. If you have questions, please reach out to Meridith, and please continue spreading the word at your site about this meeting. We look forward to another good discussion in June.
00:53:13 – Morgan Brown (Boston Children's):
All right, thanks, everybody.