

MPOG Cardiac Anesthesia Subcommittee Meeting September 23, 2023

Agenda

- Welcome & announcements
- Discussion of upcoming cardiac-focused measure reviews
- Hypoglycemia outcome measure (GLU-07-C) discussion (counter measure to GLU-06-C)
- Discussion of hyperglycemia process measure (GLU-08-C)
- Topic brainstorming for next measures and potential antibiotic redose timing and selection measures
- Summary and next steps



Introductions

- ASPIRE Quality Team
 - Allison Janda, MD MPOG Cardiac Anesthesia Subcommittee Lead
 - Michael Mathis, MD MPOG Director of Research
 - Kate Buehler, MS, RN Clinical Program Manager
- Cardiac Anesthesiology Representatives joining us from around the US!



Upcoming Cardiac-Focused Measure Reviews



Upcoming Cardiac-Focused Measure Reviews

- FLUID-01-C review, October 2023
 - We are seeking one or two volunteers from different institutions, to review this measure and associated colloid use literature
 - Commitment:
 - Present literature and suggestions at the October (10/23) Quality Committee meeting
 - Reviewers name will be listed on the Measure Spec
 - <u>Template form</u>
- TEMP-06-C & TEMP-07-C reviews in January 2025

Physician reviewing measure				
Review Temp-05 Measure Specification by selecting this link				
Review of new literature (last rev	iew)			
Dr.				
comments				
Appropriateness of rationale				
Dr.				
Evaluation of inclusion/ exclusion of	riteria			
Dr.				
Distantion of definition of automatic strength	mad cases			
Evaluation or definition of success or had	geo cases			
Dr.				
Other feedback				
Dr.				
Recommendation for Temp-05				
	Di.			
Modify: changes to measure specifications (see	0			
balow)	1000 C			



Upcoming Cardiac-Focused Measure Reviews

- FLUID-01-C: Minimizing Colloid Use (Cardiac)
 - Definition: Percentage of cardiac cases in which colloids were not administered intraoperatively
 - Rationale: Lack of consistent evidence to suggest improved survival with the use of colloids as compared to crystalloids in the surgical population. Because colloids are more expensive than crystalloids, it is recommended that anesthesia providers avoid the use of colloids in most instances.



Hyperglycemia avoidance measure (GLU-06)

- <u>GLU-06</u> is released and is available on your dashboards!
- GLU-06 Success:
 - Percentage of patients, ≥18 years age, who undergo open cardiac surgical procedures under general anesthesia of 120 minutes case duration or longer for whom any blood glucose measure did not exceed 180 mg/dL (and not rechecked within 30-minutes and found to be </=180 mg/dL) was documented.
 - Note: open cardiac cases without ANY glucose values documented are flagged



GLU-07 and GLU-08 Discussion & Preliminary Data



Cardiac Hypoglycemia Avoidance Measure (GLU-07)

• GLU-07:

- Percentage of adult patients, undergoing open cardiac surgery with any intraoperative blood glucose value < 70 mg/dL.
 - Note: open cardiac cases without ANY glucose values documented are flagged
- Timing:
 - Start: Anesthesia Start
 - End: 15 minutes after Anesthesia End





Cardiac Hypoglycemia Avoidance Measure

Concepts Queried:

Glucose MPOG Concept IDs				
3361	POC- Glucose (Fingerstick)			
3362	POC- Glucose (Unspecified Source)			
3405	POC- Blood Gas - Glucose			
5003	Formal Lab-Glucose, Serum/Plasma			
5036	Formal Lab-Blood Gas, Glucose			

• Attribution:

- The provider signed in at the first blood glucose of <70 mg/dL.
- In the event that two or more providers in the same role are signed in, both will receive the feedback.



Cardiac Hypoglycemia Avoidance Measure

- All patients, 18 years of age or older, both with and without diabetes, who undergo open cardiac surgical procedures (as determined by Procedure Type: Cardiac phenotype) under general anesthesia of 120 minutes duration or longer.
- Exclusions:

Inclusions:

- ASA 6
- Organ harvest (CPT: 01990)
- Non-cardiac cases as defined as those cases not meeting criteria for the <u>cardiac</u> <u>case type phenotype</u>
- Within the general cardiac case type <u>phenotype</u>, exclude: Transcatheter/Endovascular, EP/Cath groups and Other Cardiac
- Cases with age <18</p>



Considerations



- Evaluate each low glucose between anesthesia start and end:
 - If blood glucose <70mg/dL is rechecked within 15 minutes and found to be <70mg/dL = flagged.
 - If blood glucose <70 mg/dL is not rechecked within 15 minutes = flagged.
 - Any case with a glucose <70mg/dL that was rechecked within 15 minutes and found to be
 >/=70mg/dL = pass.
 - If no low glucose values <70 mg/dL are documented between anesthesia start and end, case is passed.
 - If two blood glucose levels are documented in the same minute, the higher blood glucose will be considered for this measure (in the case of spurious values that were rechecked)
 - If no blood glucose values are documented for a case, then the case will be flagged



Preliminary Performance: GLU-07 (hypoglycemia avoidance measure)



Cardiac Hypoglycemia Avoidance Measure

• Limitations:



- Any glucose checks not entered into the EHR will not be captured

Remaining Questions:

- Is the 15 minute recheck window appropriate?
- Should we amend GLU-06 to shorten the recheck window to 15 minutes as well? (currently 30 minute recheck window for GLU-06)



Cardiac **Hyper**glycemia Treatment Measure (GLU-08)

- Percentage of patients, ≥18 years age, who undergo open cardiac surgical procedures under general anesthesia of 120 minutes case duration or longer for whom any blood glucose measure >/=180mg/dL was either treated with insulin or rechecked and found to be <180mg/dL within 30 minutes.
 - Note: open cardiac cases without ANY glucose values documented are flagged
- Timing:
 - Start: Anesthesia Start
 - End: 30 minutes after Anesthesia End





Cardiac Hyperglycemia Treatment Measure

Concepts Queried:

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

• Attribution:

- The provider signed in at the first blood glucose of >180mg/dL.
- In the event that two or more providers in the same role are signed in, both will receive the feedback.



Cardiac Hyperglycemia Treatment Measure

Inclusions:



- All patients, 18 years of age or older, both with and without diabetes, who undergo open cardiac surgical procedures (as determined by Procedure Type: Cardiac phenotype) under general anesthesia of 120 minutes duration or longer.
- Exclusions:
 - ASA 6
 - Organ harvest (CPT: 01990)
 - Non-cardiac cases as defined as those cases not meeting criteria for the <u>cardiac</u> <u>case type phenotype</u>
 - Within the general cardiac case type <u>phenotype</u>, exclude: Transcatheter/Endovascular, EP/Cath groups and Other Cardiac
 - Cases with age <18



Considerations



- Evaluate each high glucose between anesthesia start and end:
 - For any blood glucose >/=180mg/dL, at least one of the following interventions are documented:
 - Treatment with insulin within 30 minutes, or
 - Glucose rechecked and found to be below 180mg/dL within 30 minutes

• If two blood glucose levels are documented in the same minute, the lower blood glucose will be considered for this measure



Preliminary Performance: GLU-08 (hyperglycemia treatment measure)





Performance for <u>GLU-06 (Hyperglycemia Avoidance Measure)</u>





Cardiac Hyperglycemia Treatment Measure

• Limitations:

- Any glucose checks not entered into the EHR will not be captured

- Remaining Questions:
 - Should the recheck window be shortened to 15 minutes?





Progress and Next Steps

- Build 1 cardiac-specific measure in 2021 (completed, published 12/2021)
 - Post-bypass hypothermia avoidance (TEMP-06)
- Build 1 cardiac-specific measure in early 2022 (completed, published 11/2022)
 - On-bypass hyperthermia avoidance (TEMP-07)
- Plan and build next measure in mid-2022 and publish in early 2023 (completed, published 4/2023)
 - Hyperglycemia avoidance (GLU-06)
 - Hypoglycemia avoidance and refined hyperglycemia treatment and measures to be released soon
- Next measure?



Next Measure Discussion:

- Previous suggested topics include:
 - Antibiotic selection and timing
 - Neuromuscular blockade reversal
 - Pulmonary complication avoidance
 - Hypotension avoidance
 - Acute kidney injury avoidance
 - Handoffs
 - Transfusion
 - Other ideas?



Next Measure Discussion:

- Previous suggested topics include:
 - Antibiotic selection and timing
 - Neuromuscular blockade reversal
 - Pulmonary complication avoidance
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 - Handoffs
 - Transfusion
 - Other ideas?



Antibiotic selection and timing



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Association of adherence to individual components of Society of Thoracic Surgeons cardiac surgery antibiotic guidelines and postoperative infections

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Published: April 17, 2023 • DOI: https://doi.org/10.1016/j.jtcvs.2023.03.031



Are Perioperative Antibiotics a Solved Problem?



Source: hospitalcompare.gov

Methods

MPOG registry data from 31 centers between the dates of 01/01/2014 and 12/31/2018 was extracted to estimate the adherence to four IDSA guideline metrics (timing prior to incision, choice, dosing, redosing) for antibiotic administration.

Inclusion Criteria: Patients 18 years of age or older who underwent non-cardiac surgery involving skin incision.

Exclusion Criteria:

American Society of Anesthesiologists score (ASA) 6, missing documentation for weight, antibiotic dose, or time of administration.

Results

Percent non-adherence by institution.



Results

Temporal trends in adherence from 2014 to 2018.



But what about Cardiac... Aren't we better than that?

In this retrospective study using prospectively collected, STS-adjudicated outcomes data, 38.3% of cases were non-adherent to at least one component of STS antibiotic guidance. Failure of first dose timing and failure to weight adjust doses were associated with adverse events post surgery.

Of the 2829 included patients, 1084 (38.3%) received care that was nonadherent to at least 1 aspect of Society of Thoracic Surgeons antibiotic guidelines. The incidence of nonadherence to the 4 individual components was 223 (7.9%) for timing of first dose, 639 (22.6%) for antibiotic choice, 164 (5.8%) for weight-based dose adjustment, and 192 (6.8%) for intraoperative redosing.

Antibiotic Non-	Postoperative	Postoperative	30-day mortality,		
Compliance	infection, Adjusted	Sepsis, Adjusted	Adjusted		
Domain	OR (95% CI)	OR (95% CI)	OR (95% CI)		
Timing prior to	1.9 (1.1-3.3),	2.2 (0.79-6.01),	0.8 (0.3-2.3),		
incision	<i>P</i> = .02	<i>P</i> = .13	<i>P</i> = .71		
Choice	1.1 (0.7-1.7),	0.54 (0.18-1.61),	0.7 (0.3-1.5),		
	<i>P</i> = .80	<i>P</i> = .27	<i>P</i> = .30		
Weight-	1.10 (0.5-2.5),	6.9 (2.5-18.5),	4.3 (1.7-11.4),		
adjusted Dosing	<i>P</i> = .81	<i>P</i> < .001	<i>P</i> = .003		
Redosing	0.6 (0.3-1.2),	0.35 (0.1-1.9),	0.6 (0.2-2.1),		
	P = .18	<i>P</i> = .23	P = .39		
\bigcirc Significant at $P < .05$ Significant at $P < .01$					

Association of adherence to individual components of Society of Thoracic Surgeons cardiac surgery antibiotic guidelines and postoperative infections J Thorac Cardiovasc Surg. 2023 Apr 17;S0022-5223(23)00325-2.

Thank you!!!

Rob Schonberger, Yale School of Medicine Amit Bardia, MGH

Cardiac Anesthesia Subcommittee Membership

- Open to all anesthesiologists or those interested in improving cardiothoracic measures
 - Do not have to practice at an active MPOG institution
- Proposed 2023 Meeting Schedule
 - April 2023
 - August/September 2023
 - November or December 2023
- Thank you for using the forum for discussion between meetings



Thank you!

Allison Janda, MD MPOG Cardiac Anesthesia Subcommittee Chair ajanda@med.umich.edu



Glucose Measure Literature/Guidelines:

- In a study of 510 patients undergoing cardiovascular surgery and found the incidence of AKI to be higher in patients with high HbA1c levels preoperatively; Every 1% increase over 6% in HgA1c levels increased the risk of renal complications by 24%¹
- Glycemic variability, a standard deviation of all POC-BG readings, is associated with increased postoperative LOS-ICU, rise in creatinine, and AKI²
- A study including 761 cardiac surgery patients and found that diabetics were at increased risk of infection and glucose control (120-160 mg/dL) reduced the risk of wound infection in diabetics ³
- In a randomized controlled trial, moderate glucose control defined as 127-179 mg/dl was found to be preferable to tight control \leq 126 in patients undergoing CABG ⁴



Glucose Measure Literature/Guidelines Continued:

- Incidence of AKI was higher in patients with time-weighted average intraop glucose of >150mg/dl (8%) as compared to patients with blood glucose 110-150 mg/dl (3%) ⁵
- KDIGO recommends maintaining blood glucose between 110 149 mg/dL in critically ill patients ⁶
- Tight glucose control (<150mg/dl) is seen as controversial as risks of hypoglycemia are significant: NICE-SUGAR meta-analysis⁷
- Society of Thoracic Surgeons (STS) Practice Guidelines recommend maintaining serum glucose levels ≤ 180 mg/dL for at least 24 hours after cardiac surgery ⁸
- Guidelines for Perioperative Care in Cardiac Surgery from the Enhanced Recovery After Surgery Society recommends treatment of blood glucose >160-180mg/dL with an insulin infusion ⁹



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Current Cardiac-Specific Measures Developed by the Subcommittee



TEMP-06

Success:

Percentage of patients, ≥18 years age, who undergo an open cardiac surgical procedure under general anesthesia of 120 minutes duration or longer for whom the last non-artifact body temperature measure at the end of the case was greater than or equal to 35.5 degrees Celsius (or 95.9 degrees Fahrenheit).

Reported as an inverse measure (lower = better)



TEMP-07

Success:

Percentage of patients, \geq 18 years age, who undergo an open cardiac surgical procedures using cardiopulmonary bypass under general anesthesia of >120 minutes for whom the temperature was > 37.5 degrees Celsius while on bypass for over 5 consecutive minutes

Reported as an inverse measure (lower = better)



GLU-06

• Success:



- Percentage of patients, ≥18 years age, who undergo open cardiac surgical procedures under general anesthesia of 120 minutes case duration or longer for whom any blood glucose measure did not exceed 180 mg/dL (and not rechecked within 30-minutes and found to be </=180 mg/dL) was documented.
 - Note: open cardiac cases without ANY glucose values documented are flagged

