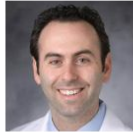


MPOG Pediatric Subcommittee Meeting

March 7, 2023



Brad Taicher, DO, MD
DUKE MEDICINE
Chair



Vikas O'Reilly-Shah, MD, PhD
SEATTLE CHILDREN'S
Vice-Chair



Meredith Bailey, MSN, RN
MPOG
Pediatric Program Lead



Agenda

Announcements

Dr. Brad Taicher, Duke University

Measure Review: Intraoperative Normothermia (TEMP-04)

Dr. Vikas O'reilly-Shah, Seattle Children's

QI Collaboratives in Pediatric Anesthesia

Dr. Jay Deshpande, Wake Up Safe

Pedi-Sustainability Update

Dr. Y. Eva Lu-Boettcher, University of Wisconsin

Upcoming Meetings

Friday, March 31, 2023

Update at SPA Quality & Safety
Austin, TX (hybrid)

June, 2023

MPOG Pediatric Subcommittee
Virtual

Friday, October 13, 2023

MPOG Annual Retreat
San Francisco, CA



QI Measure Page Updated

QI Measures

Search:

	Measures	Measure Type	Date Published	Date Revised	Toolkit
Acute Kidney Injury 	AKI-01: Acute Kidney Injury	Outcome	06/12/2017	09/20/2021	
Blood Pressure 	BP-01: Blood Pressure, Pediatrics BP-02: Blood Pressure, Pediatrics BP-03: Blood Pressure, Pediatrics BP-05: Blood Pressure, Pediatrics	Pediatrics 	FLUID-02-Peds: Minimizing Colloid Use, Pediatrics NMB-03-Peds: NMB Dosing, Pediatrics PAIN-01-Peds: Multimodal Analgesia, Pediatrics PONV-02: PONV Prophylaxis (Old): Pediatrics PONV-04-Peds: PONV Prophylaxis: Pediatrics SUS-05-Peds: Nitrous Used during Induction, Pediatrics TEMP-04-Peds: Intraoperative Normothermia, Pediatrics TRAN-03-Peds: Transfusion Vigilance, Pediatrics TRAN-04-Peds: Overtransfusion, Pediatrics	06/12/2017 06/12/2017 06/12/2017 06/12/2017 06/12/2017 06/12/2017 06/12/2017 06/12/2017 06/12/2017 06/12/2017	09/20/2021 09/20/2021 09/20/2021 09/20/2021 09/20/2021 09/20/2021 09/20/2021 09/20/2021 09/20/2021 09/20/2021
Fluids 	FLUID-01: Fluids, Pediatrics				
Glucose Management 	GLU-01: High Glucose Treated, Intraop GLU-02: Low Glucose Treated, Intraop GLU-03: High Glucose Treated, Periop GLU-04: Low Glucose Treated, Periop GLU-05: Escalated High Glucose Treated	Process Process Process Process Process	07/01/2015 07/01/2015 03/01/2020 03/01/2020 12/11/2020	03/24/2021 03/24/2021 10/28/2022 03/24/2021 04/11/2022	

Additional Sections to note updates and measure contributors

Measure Reviewer(s)

Next Review: 2023

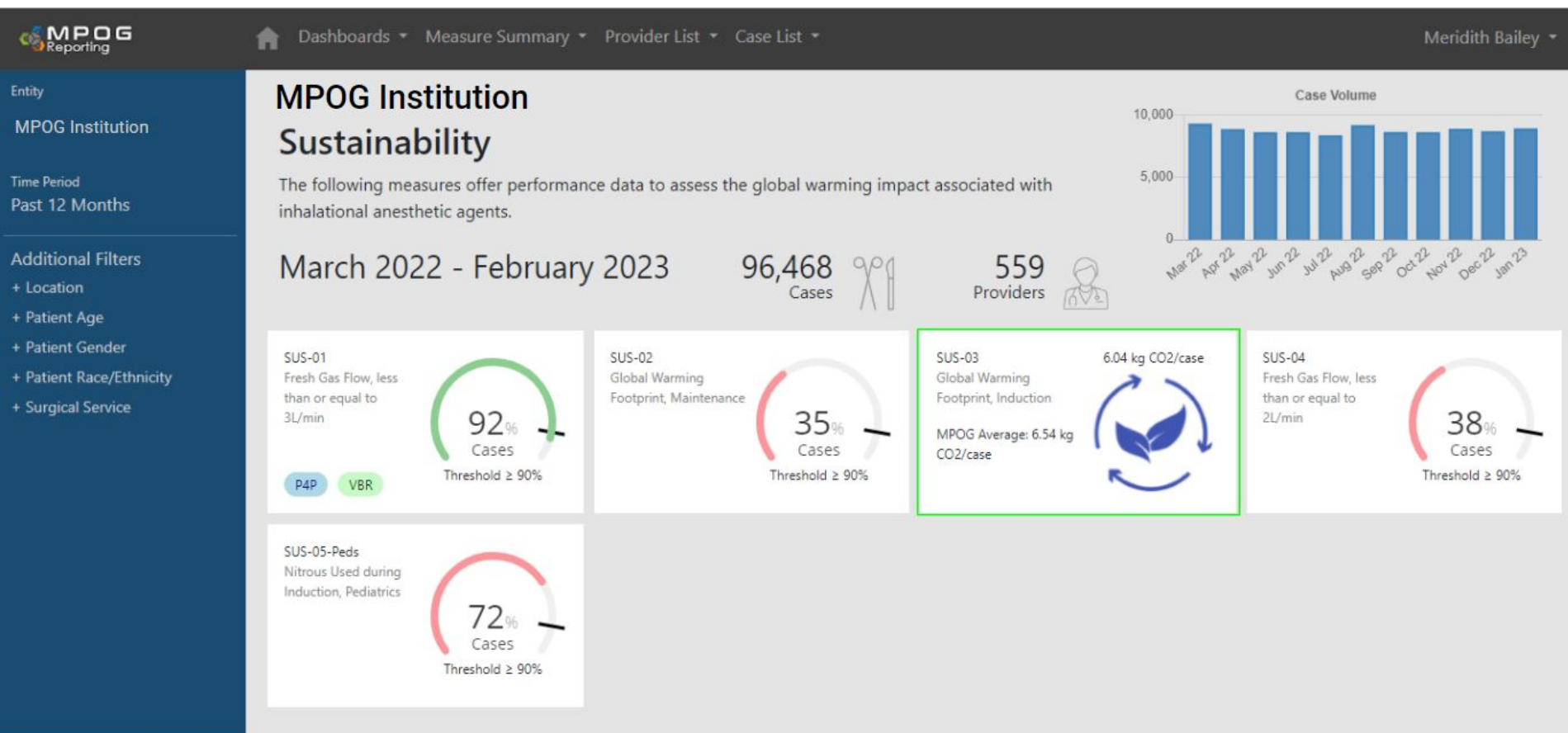
Date Reviewed	Reviewer	Institution	Summary	QC Vote
03/07/2023	Vikas O'reilly-Shah, MD	Seattle Children's	Review	

Version

Published Date: 04/2020

Date	Criteria	Revision
03/15/2022	Exclusion	Modified to use Procedure Type: Cardiac phenotype
03/25/2021	Exclusion	Modified to use Obstetric Anesthesia Technique phenotype; Case invalid if case end results before case start
04/06/2020		Initial Publication

New! Sustainability Dashboard



New! Informational Measure

Entity

Time Period

Past 12 Months

Patient Age

Pediatric

Additional Filters

+ Location

+ Patient Gender

+ Patient Race/Ethnicity

+ Surgical Service

SUS-03: Global Warming Footprint, Induction [More Info](#)

Carbon dioxide equivalents normalized by case for cases receiving halogenated agents and/or nitrous oxide during the induction period of anesthesia

Providers



Case List

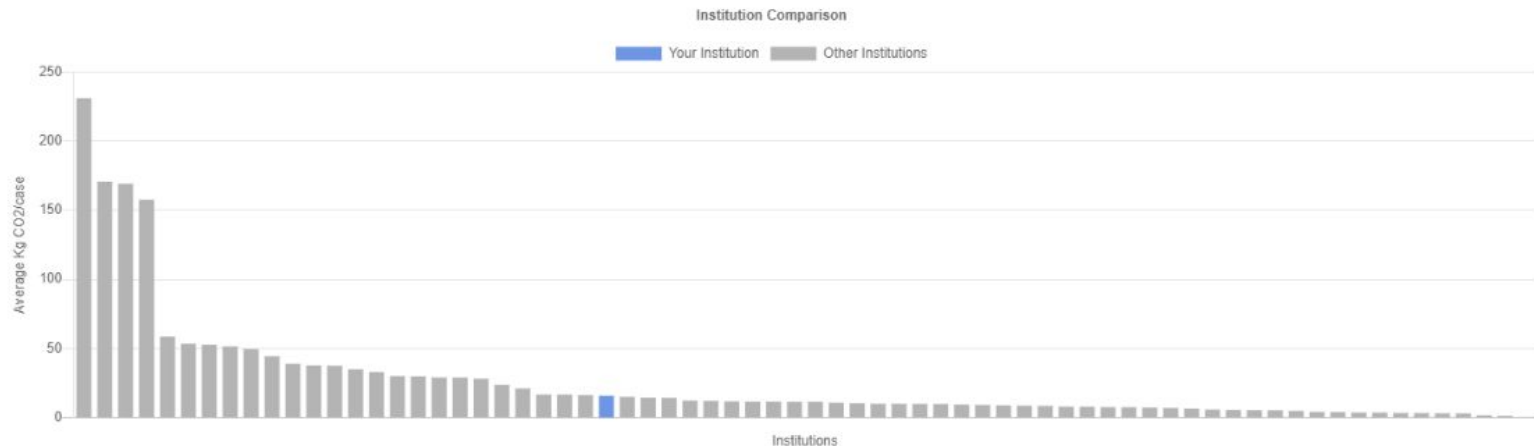
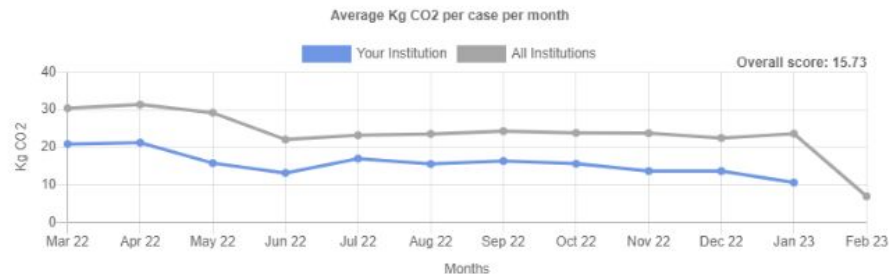
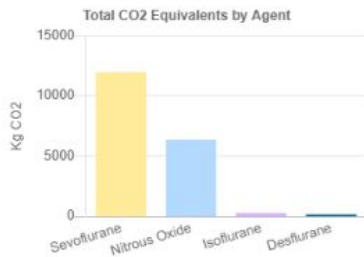


Carbon Footprint

15.73 kg CO₂/case



MPOG Average:
25.40 kg CO₂/case



Quality Committee Update

Meetings held January 24th and February 27th

Two measures reviewed

- Oral Morphine Equivalents, Intraop
 - Pediatric measures include Tonsil/Adenoidectomy & Spine
 - **QC Vote: Modify** or add separate measure for OME in PACU
- Transfer of Care: ICU
 - Yes/no measure of whether ICU handoff was documented by anesthesia provider
 - **QC Vote: Continue as is**, consider adding handoff elements in the future

New Measure Proposed and approved:

- Low dose Sugammadex use



Measure Review TEMP 04

Dr. Vikas O'reilly-shah
Seattle Children's

TEMP-04: Pediatric Normothermia, Intraop

Initial publish date: April 2020

Success: median core/near core body temperature > 36C (96.8F)

Time period: Patient in room → Patient out of room

Exclusions

- Patients \geq 18yo
- ASA 5 & 6
- Cases < 30 minutes
- Cases without a temperature route documented
- Labor epidurals, Cardiac procedures, MRI
- MAC/Sedation cases

Provider Attribution: Provider present for the longest duration of the case (per staff role)

TEMP-04 Measure Review

Thank you to Dr. Jacques Scharoun (*Weill Cornell*) for contributing to the review!

https://docs.google.com/document/d/1eobbVKOtF8yuqidx-qUz3O_uXra483pqEqfBeOAxHso/edit

Discussion

Summary of recommended modifications

Easier

- Add hyperthermia criterion (any temp > 38)
- Add exclusion: gastroenterology
- Add exclusion: interventional radiology
- Add exclusion: cath lab/cardiology
- Add exclusion: preop temp <36 or >38

More controversial/harder

- Modify flag to encompass exposure length (not median), though the correct approach is unclear.
Disagree with using point values for hypothermia (e.g. single temp under 36). Possible approaches:
 - Finite, defined exposure (> 15 minutes at <36)
 - 25% of the procedure length (defined as surgery stop - surgery start)
 - Some AUC based approach (depth * time of exposure)

TEMP 04

1 vote per site

Continue as is / modify / retire

Need > 50% to retire measure

Coordinating center will review all votes after meeting to ensure no duplication





QI Collaboration in Pediatric Anesthesia

Dr. Jay Deshpande
Wake Up Safe



Pediatric Sustainability Update

Dr. Eva Lu-Boettcher
University of Wisconsin

Introducing SUS-06-Peds

❏ SUS-06-Peds Details

- ❏ Induction: significant opportunity to decrease greenhouse gas emissions.
- ❏ Key determinants: Agent choice and Fresh Gas Flow.

❏ Questions and Feedback

❏ Poll: Interest in SUS Toolkit - Peds

- ❖ US health care sector contributes ~10% of the nation's greenhouse gas (GHG) emissions.
- ❖ One third of the carbon footprint of an average surgical procedure and up to 5% of a hospital's GHG emissions can come from volatile anesthetics.

Environmental/health impacts of U.S. health care activities.

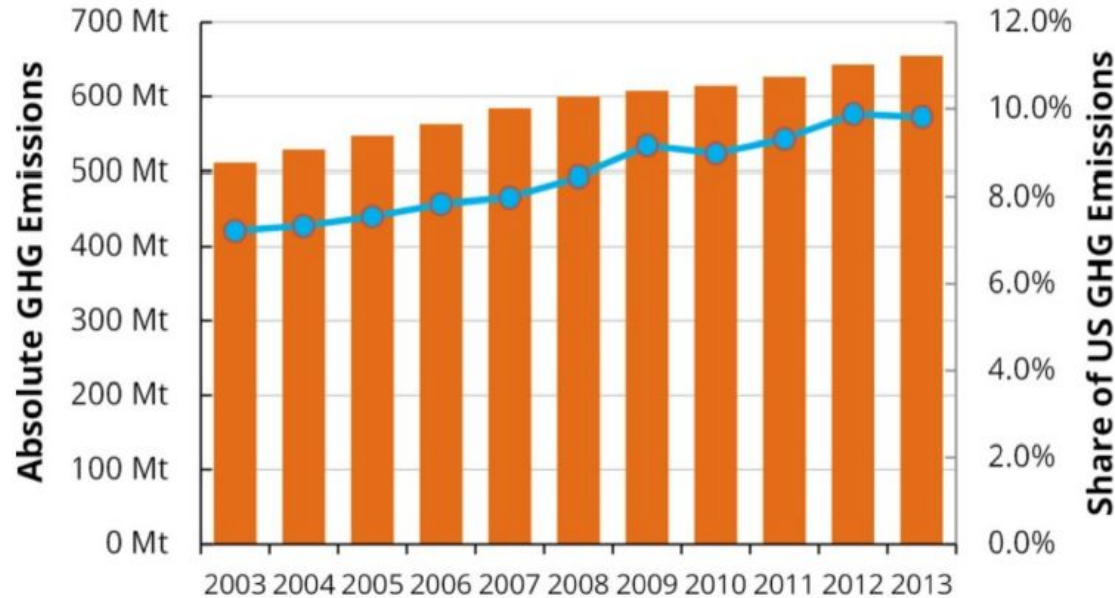


Table adapted from Eckelman et. al. June 2016

Induction FGF Matters:

Next to volatile choice, FGF is the second most important determinant of carbon footprint of anesthetics.

Table. One hour of anesthetic is like driving a car [how many?] miles.^a

Dose (1-MAC-hr)	Sevoflurane 2.2%	Isoflurane 1.2%	Desflurane 6.7%	N ₂ O ^b 0.6 MAC-hour
0.5 L/min	—	4	93	29
1.0 L/min	4	7	189	57
2.0 L/min	8 (~29mi at 8%)	15	378	112
5.0 L/min	19 (~69mi at 8%)	38	939	282
10.0 L/min	38 (~137mi at 8%)	74	1,876	564

a Assumes EPA 2012 fuel efficiency average of 23.9 miles per gallon.

b Because N₂O cannot be delivered at 100%, the more typical percentage of 60% is used. In combination, 0.6 MAC-hour of N₂O would be added to 0.4 MAC-hour of a volatile.

EPA, Environmental Protection Agency; **MAC**, minimal alveolar concentration; **N₂O**, nitrous oxide

Table adapted from Sherman et al. April 2017

SUS-06-Peds: Low Fresh Gas Flow, Induction

Description: Percentage of pediatric cases with a max fresh gas flow (FGF) equal to or less than a weight-based threshold during the induction phase of anesthesia.

Measure Type: Process

Threshold: 90%

Measure Time Period: [Induction Start](#) → [Intubation](#). If none, then [Induction End](#)

Inclusions: Pediatric cases < 18y where halogenated hydrocarbons and/or nitrous oxide were administered during the induction phase of anesthesia

Exclusions:

- Patients \geq 18yo
- Cases without a valid weight documented
- Cases without automated FGF data (ie those that are manually entered)
- Cases in which halogenated hydrocarbons or nitrous oxide are NOT used during the induction phase of anesthesia



Success Criteria: Mean FGF equal to, or less than the weight-based max FGF (L/min) during the induction period of anesthesia, as displayed by table below

Provider Attribution: All providers signed in during the induction period of anesthesia

Other Measure Details:

Weight (kg)	Mean FGF
< 20	≤ 3 L/min
20-30	≤ 4 L/min
30-40	≤ 5 L/min
> 40	≤ 6 L/min

[Table: Glenski et al 2022. "Low Flow Anesthesia in Pediatric Patients."](#)

Simplified calculation for FGF Induction:

- Set FGF to exceed minute ventilation (VE) for open circuit conditions:
 - **150 mL x weight (kg)**, where $VE \sim 120$ ml/kg estimate based upon VCO_2 from Brody's equation:

FGF induction \geq MV

- Minute Ventilation (VE) = $V_t \times RR$

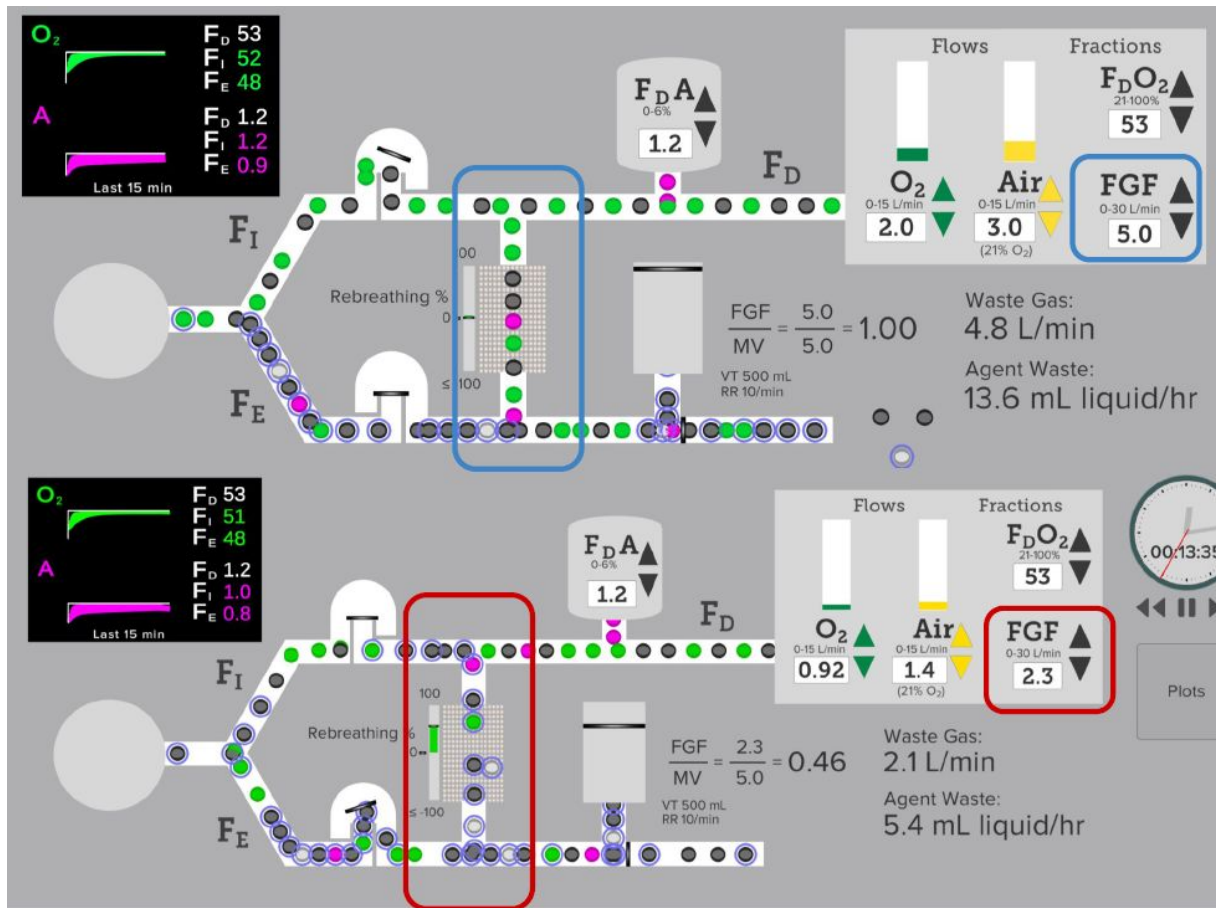
Simplified calculation for FGF Induction:

- Set FGF to exceed minute ventilation (VE) for open circuit conditions:
 - **150 mL x weight (kg)**, where $VE \sim 120$ ml/kg estimate based upon VCO_2 from Brody's equation:
 - $VCO_2 = 5.56 \times (Wt \text{ in Kgs})^{1.05}$
 - Approximation: $VCO_2 = 6 \times Wt \text{ in Kgs}$
 - Fraction of CO_2 in the alveolus
 - $FACO_2 \sim 0.05$ at sea level
 - Minute Ventilation = $VCO_2 / FACO_2 \sim (6 \times Wt \text{ in Kgs}) / 0.05 \sim 120 \times Wt \text{ in Kgs}$
- Values on table calculated based on 150mL x Weight (kg)

Why set induction FGF to exceed minute ventilation during induction?

-Prevent rebreathing/dilution

Simulation courtesy of “Low Flow Anesthesia” from the University of Florida
Center for Safety, Simulation & Advanced Learning Technologies:



References:

1. Sherman, J, Feldman, J, Berry J; Reducing Inhaled Anesthetic Waste and Pollution. Anesthesiology News. 2017 April.
2. Eckelman MJ, Sherman J. Environmental Impacts of the U.S. Health Care System and Effects on Public Health. PLoS One. 2016 Jun 9;11(6):e0157014. doi: 10.1371/journal.pone.0157014. PMID: 27280706; PMCID: PMC4900601
3. Lewis H, Groome J, Arnold P, Brooks P; PATRN. How green is pediatric anesthesia? The Pediatric Anesthesia Trainee Research Network 2021 UK National Survey. Paediatr Anaesth. 2022 Jun;32(6):772-775. doi: 10.1111/pan.14435. Epub 2022 Mar 20. PMID: 35279901.
4. Sherman, J, McGain, F; "Environmental Sustainability in Anesthesia." *Advances in anesthesia*, 2016, Vol.34 (1), p.47-61. DOI 10.1016/j.aan.2016.07.004
5. Feldman JM, Lockman J, Yaster M. "Remembering the Classics: The Art of Low Flow Anesthesia." Pediatric Anesthesia Article of the Day. March 28 2022. <<https://ronlitman.substack.com/p/remembering-the-classic-the-art-of>>.
6. Feldman JM: Managing fresh gas flow to reduce environmental contamination. Anesth Analg 2012; 114:1093-101
7. Glenski T, Narayanasamy S. "Low Flow Anesthesia in Pediatric Patients." SPA One Pagers. August 2021.
8. American Society of Anesthesiologists' Task Force on Environmental Sustainability Committee on Equipment and Facilities. Greening the operating room.

Wrap Up

Next Subcommittee Meeting: June - doodle poll will be posted on basecamp

Call for Measure Contributors!

- Antibiotic Timing, intraop (ABX-02-peds)
- Multimodal Analgesia (PAIN-01-peds)

Contact Meridith (meridith@med.umich.edu) if interested



Thank You!