

Reducing Waste Associated With Bloodline Setups

Dale Tager, MD, MBA, Mary Carter Mullen, MD, Julian Rowe, MD
Mentors: Patricia Mack, MD, Deirdre C. Kelleher, MD
Staff: Aaron Weinberg, Diego Bauza, Michelle Tiangco

Department of Anesthesiology, Weill Cornell Medicine, New York-Presbyterian Hospital, New York, NY



Background

- Our standard institutional practice for all neurosurgical cases included a blood line setup, however, blood transfusions remain rare.
- Warmed IV fluids do not contribute substantially to patient temperature management, raising core temperature by only ~1/2 degree with likely no clinical benefit.¹
 - Warmed IV fluids not indicated below flow rates of 35cc/min
 - Only indicated for large volume blood transfusion

Problem

Universal use of blood setups in neurosurgical procedures with low transfusion rates can be wasteful, resulting in financial loss, time waste, and excess carbon emissions.

Objective

- Reduce unnecessary bloodline setups in adult neurological surgery cases by 15% over 1 year
- Determine safety and savings of making fluid conservation practices standard.

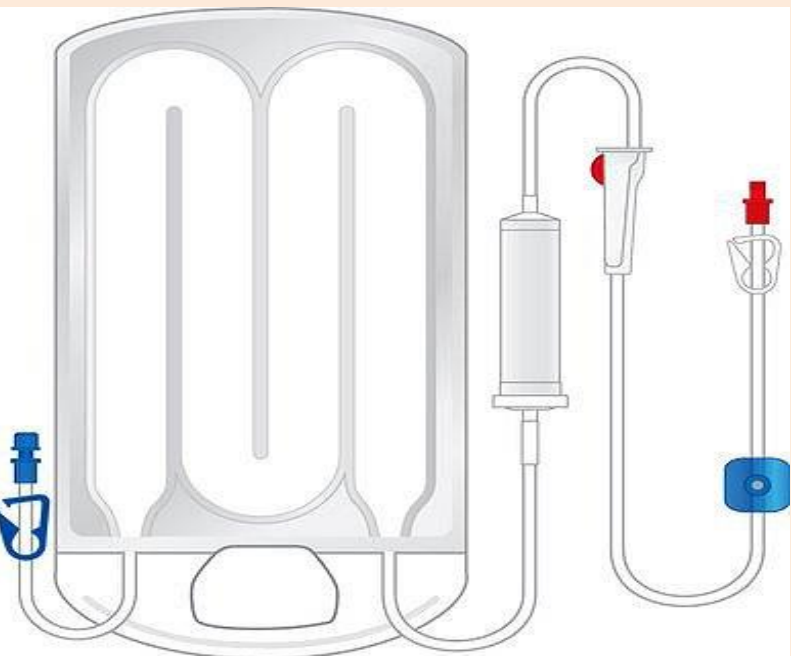
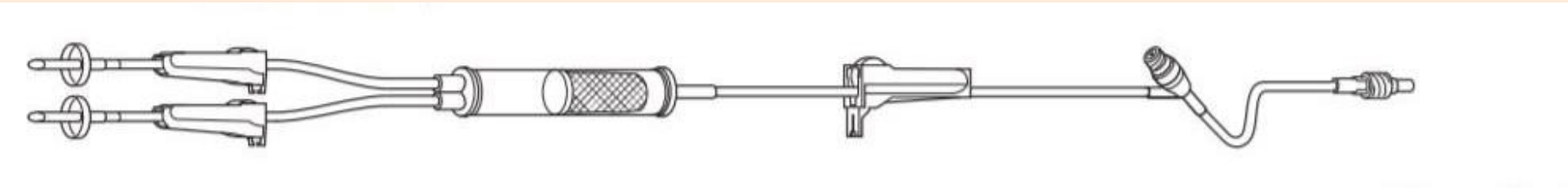
Methods

- Calculate financial cost of current bloodline setup and alternative solutions (basic IV tubing or short extension tubing "leash")
- Calculate environmental burden of current bloodline setup and alternative solutions by weighing all components (except fluid bags) including outer packaging.
- Review PACU temperature data from fluid warmer cartridge shortage (compared to time with universal use) for any noticeable effects
- Calculate recent transfusion rates for neurosurgical cases
- Informally survey clinicians for comfort with alternative "standards"

¹Bindu, Barkha; Bindra, Ashish; Rath, Girija. Temperature management under general anesthesia: Compulsion or option. Journal of Anaesthesiology Clinical Pharmacology 33(3):p 306-316, Jul–Sep 2017. | DOI: 10.4103/joacp.JOACP_334_16

Components of Bloodline Setups

Blood Setup: Primed blood Y-tubing, fluid warming cassette with ranger, stopcock, extension tubing, fluid bag



Unused Set up: No blood was transfused

Financial & Environmental Impacts

- Less than 3% of adult neurosurgery patients received blood products
- There was no detectable pattern (surgeon, case type) to predict when blood was needed

Projected Annual Cost Savings

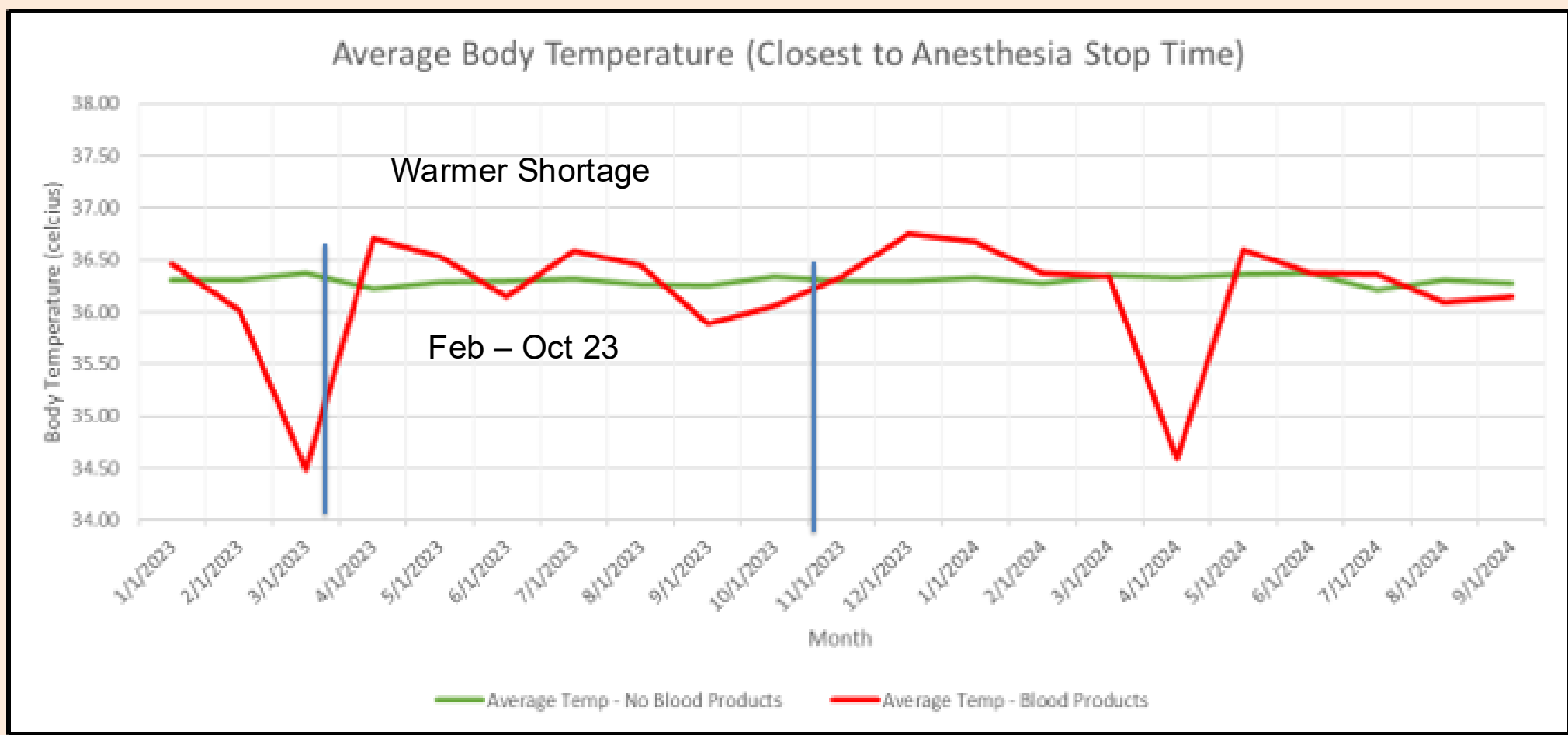
	Blood Warmer	Basic IV Tubing	Leash Only
Monthly Cost	\$3848.34	\$2027.40	\$228.78
Annual Cost	\$46,180.08	\$24,328.80	\$2745.36
Projected Annual Savings		\$21,851.28	\$43,434.72

Projected Annual Weight and CO2 emissions

	Blood Warmer	Basic IV Tubing	Leash Only
Plastic waste	510 kg	186 kg	38 kg
CO ₂ emissions (converted from kg of waste)	1325 – 1738 kg CO ₂ e	482 – 632 kg CO ₂ e	99 – 129 kg CO ₂ e
Projected CO ₂ e Annual Savings		843 – 1106 kg CO ₂ e	1226 – 1609 kg CO ₂ e

Historic Temperature Data

No detectable difference in PACU temperatures when warmers used in transfusions only (Feb-Oct 2023)



Conclusions

Use of blood warmer over leash when blood is not given is:

16x the cost, 13x the weight, 13x the CO₂ emissions

Unmeasured Savings:

- CO₂ emissions from transporting supplies to the hospital
- Labor & space saved from having to keep greater stock of supplies
- Labor, cost, and CO₂e from transporting & disposing of supplies

Next Steps

- Universally message that the “leash” is the new “Cornell standard” for 2nd IVs in neuro cases (via email, setup guidelines, in-person conference presentation, trainee "bootcamp")
- Investigate other areas of bloodline waste:
 - Robotics
 - Hysterectomy and major gynecological procedures
 - Prostatectomies and major urologic procedures
 - Orthopedics
- Review purchasing records to determine procurement decrease