

Sustainable Normothermia Management with Financial Impact in Ophthalmology MAC Cases

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Background

Maintaining normothermia (36-38°C/98.8-100.4°F) is a standard of care associated with improved patient outcomes impacting surgical site infection, wound healing, cardiac events, recovery times, and patient comfort (2).

Induction of general anesthesia significantly impacts a patient's ability to maintain normothermia (1).

In 2016, a one-size fits all approach was implemented for pre-operative warming as part of the SSI prevention bundle: All patients had a pre-operative warming gown applied to prevent hypothermia commonly associated with induction of general anesthesia, excluding vascular and cardiac procedures.

Products used to support normothermia can be cost prohibitive and can negatively impact the environment:

- Warming gowns are a one patient use product
- Polypropylene, a thermoplastic polymer not considered a bio-degradable or compostable material, is listed as a component of the warming gown.

Purpose

The purpose of this work was to adjust the established process for pre-operative warming to reduce waste and maintain outcomes for ophthalmology procedures scheduled with Monitored Anesthesia Care (MAC).

Literature Review

A literature review was completed where few recent publications exist specifically outlining MAC impact on thermoregulation.

One article from 2010 outlined medications used for sedation and general anesthesia impact thermoregulation (1).

Expert opinion from an anesthesia provider at UW Health supports that thermoregulation impacts for patients having MAC may be minimal given the type of procedures, the medications administered to achieve MAC, and lengths of procedures.

Methods & Results

Phase I

- Current pre-op warming process outlined
- After Literature review and expert opinion, the consensus was to complete a pilot to determine if normothermia could be maintained without pre-op active warming gown for ophthalmology procedures scheduled 60 minutes or less with MAC.
- Notification of the pilot and normothermia re-education provided to anesthesia and nursing staff who provide care in the perioperative department.
- A 3 week pilot demonstrated normothermia could be maintained with the use of a linen gown in ophthalmology cases having a procedure with MAC.

Type of gown	Cost per gown	Weight in grams (g)
Standard active warming gown	\$13.23	222 g
Extra-large active warming gown	\$17.23	274 g
Standard linen gown	\$0.65	406 g
Extra-large linen gown	\$0.73	473 g

Phase II

3 Week Pilot

MAC patients with procedures ≤ 60 minutes (Weeks 1 & 2)	MAC patients with no time requirement (Week 3)
62 Patients Total	45 Patients Total
Pre-operatively: <ul style="list-style-type: none"> • 60 were normothermic • 2 patients did not have a pre-operative temperature documented 	Pre-operatively: <ul style="list-style-type: none"> • 44 were normothermic • 1 patient did not have a pre-operative temperature documented
Post-operatively: <ul style="list-style-type: none"> • 59 were normothermic • 2 patients required active warming and 1 patient did not have a post-operative temperature documented 	Post-operatively: <ul style="list-style-type: none"> • 45 were normothermic
The Clinical Nurse Specialist had found documentation of the active warming gown by pre-operative staff was initially reflexive where reports of documentation were not indicative of actual practice.	

Conclusions

Ophthalmology patients who have MAC can thermoregulate with a linen gown and eliminate waste of a one-time use product and creates cost savings.

Location	# Cases in 2024	Projected Cost Savings				
		Total Cost of standard active warming gown	Total Cost of standard linen gown	Total weight in pounds (lbs.) of standard gown	Projected Waste Diverted from Landfill	Projected Yearly Savings*
Madison Surgery Center	475	\$6,285	\$309	425 lbs.	233 lbs.	\$5,823
University Hospital Inpatient OR and Outpatient Surgery Center	1,524	\$20,163	\$991	1,364 lbs.	746 lbs.	\$18,679

*Cost of standard active warming gown + \$0.50 per 1 lb. of waste disposal – cost of linen gown – cost per clean 1 lb. of linen laundry (\$0.635)

Next Steps

- Consider other procedures where a small area of the body is exposed for surgery where the patient undergoes MAC and/or local.
- Depending on the size of active warming gown there could be further additional cost savings and waste diversion.

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References

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