

EFFECT OF PREWARMING ON INADVERTENT HYPOTHERMIA AND THERMAL COMFORT

Marci Trump, MSN, RN, CNOR

Kathryn Mercado, BSN, RN

Adrianna Medina, RN, CNOR

Janeen Lozada, BSN, RN, CPAN

Denise Rainier, BSN, RN, MBA

Peggy Kalowes, PhD, RN, CNS, FAHA

Background

- The Association of Perioperative Registered Nurses,¹ states inadvertent perioperative hypothermia (IPH) occurs when core body temperature reaches < 36°C or 96.8° F.
- Incidence of IPH in elective surgery is reported to be 26% to 90%.² Yet, it is a preventable anesthesia- and surgery-related complication affecting patients' outcome.
- IPH is associated with an increased risk of surgical site infections (SSIs), bleeding, postoperative shivering and cardiovascular complications.³
- All patients, regardless of age/gender, are at risk for developing IPH when general anesthesia or regional anesthesia is involved.⁴

Methodology

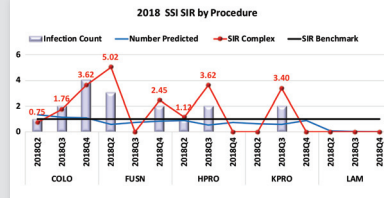
- A prospective, non-experimental design was used to test the hypothesis that orthopedic/colorectal adult surgical patients who are pre-warmed using a FAW gown will maintain normothermia, and demonstrate a reduction in post-operative complications.

Instruments

- The Thermal Comfort Inventory scale (TCI) was used to test patient thermal comfort/satisfaction; and to examine for a reduction in anxiety, vs a baseline cohort.
- Using a pre-and-post test design, perioperative nursing staff was surveyed regarding their knowledge of perioperative patient warming and the impact on patient outcomes.

Results

- N=496 surgical patients were included in the trial. Post-implementation of FAW, there was an overall improvement in post-operative complications.
- N=23 patients required blood transfusions, which is an overall decrease of 23% from pre-implementation.
- The SSI data showed a decrease in spinal fusion, and joint replacement from pre-implementation, and the laminectomy procedures remained below the SIR at zero infections.



PROJECT AIMS

Primary Aim

Test the effectiveness of perioperative pre-warming in the orthopedic/colorectal surgical population, using a forced air warming (FAW) gown for 30-minutes pre-operatively, to reduce inadvertent intra and post-op hypothermia and related complications.

Secondary Aim

- Increase patient thermal comfort and reduce anxiety through utilization of FAW gown across the perioperative experience.
- Improve perioperative nurse's knowledge regarding the science and rationale for perioperative patient warming and the related impact on patient clinical outcomes and thermal comfort and anxiety.



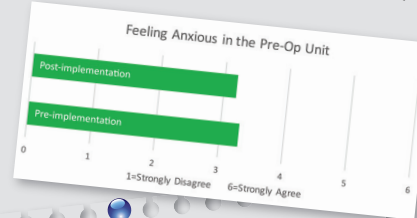
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MemorialCare Miller Children's & Women's Hospital
MemorialCare Long Beach Medical Center

For more information, contact
Marci Trump, MSN, RN, CNOR
MBaker2@memorialcare.org

Patient Anxiety

- Baseline data revealed that over half of the patients surveyed did not report feeling anxious prior to surgery, thus, findings indicate only a marginal improvement in anxiety levels.



Staff Knowledge

- There was greatest improvement in staff knowledge r/t causes of unintended perioperative hypothermia.
- Findings indicate that 58% of the perioperative staff showed improvement in their understanding of the interventions for maintaining normothermia.

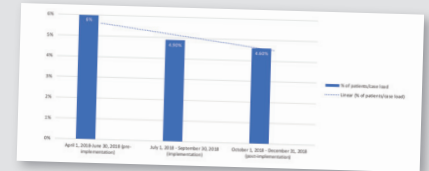
Question	Pre-Implementation		Post-Implementation		Net Change
	# of surveys	% Correct	# of surveys	% Correct	
1. Definition of periop hypothermia	117	63%	85	64%	8%
2. Negative outcomes of hypothermia	117	83%	85	99%	8%
3. Induction most significant cause IPH	117	85%	85	81%	0%
4. Temp in the periphery cooler than core temp	117	85%	85	100%	15%
5. Causes of unintended periop hypothermia	117	85%	85	100%	15%
6. Most effective normothermia intervention	117	28%	85	82%	54%

Conclusions

We hypothesized, based on a strong literature-base, that adding forced air warming preoperatively to our on-going warming protocol would facilitate the reduction in post-op complications.

Data Showed:

- Reduction in blood usage;
- Reduction in SSIs in joint replacements and spinal fusion;
- Correlation between increased warmth and decreased patient anxiety levels;
- Staff had increased knowledge of IPH, showing most improvement in FAW as the most effective method in maintaining normothermia.



IMPLICATIONS

Clinical Implications

- Implementation of AORN current EBGs of Perioperative Patient Warming improves patients surgical outcomes.
- Rigorous multidisciplinary team approach to address the multi-factorial cause(s) contributing to SSI's.
- Continued monitoring of adherence to new prewarming best practices is needed.
- Continued periop staff education is needed on risks and outcomes r/t hypothermia.
- Create system-wide policy for pre-op warming.

REFERENCES

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3. Madrid E., Urrutia G., Roque I., Figuls, Pardo-Hernandez H., et al. Active body surface warming systems for preventing complications caused by inadvertent perioperative hypothermia in adults. *Cochrane Database Systematic Review*. 2016. 21(4) CD0091016.
4. Levin R., Wright F., Pecoraro K., Kopeck W. Maintaining Perioperative Normothermia: Sustaining an Evidence-Based Practice Improvement Project. *AORN J* 103 (2016) 211.e1-211.e13. dx.doi.org/10.1016/j.aorn.2015.12.020

