

Preventing Hypothermia in the Perioperative Patient

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INTRODUCTION

“Prime that arterial line! Why is that oxygen saturation probe not registering? Get those blankets off!” Mr. R.F, a 71 year old male, initially in the operating room for a right hip gamma nail insertion, now lies fully exposed as the perioperative team works tirelessly to stabilize his quickly deteriorating state. Lines, tubes, and endless monitor leads are connected to gain insight into his present medical state. Crystalloid fluid boluses are initiated at room temperature. Mr. R.F is rolled, lifted, and manipulated during these resuscitating efforts. His thin surgical gown is now at the foot of the stretcher, and the flannel blankets have been tossed to the floor.

This is a classic scenario illustrating the complex and efficient workings of the perioperative team on a deteriorating patient. Experience and effective skill/resource management during such cases are essential. What is commonly overlooked in hindsight is promoting and maintaining patient temperature. Though medical and nursing interventions were appropriately prioritized, we later recognized he was fully exposed in the 18 degrees Celsius operating room for much longer than necessary.

LITERATURE REVIEW

The body continuously produces heat through metabolic activities and loses heat through convection, evaporation, conduction, and radiation (Phillips, 2013, p. 539). Convection from exposure to environment, evaporation via respiration, and conduction from contact with cool surfaces all contribute to patient heat loss. Hypothermia is defined as a core body temperature of less than 36 degrees Celsius (Phillips, 2013, p. 539). Signs and symptoms associated with hypothermia include: cardiac dysrhythmias, hypoxia, metabolic acidosis, hyperglycemia, shivering, impaired speech, muscle rigidity, peripheral or central cyanosis, weak pulses, decreased blood pressure, and compromised coagulopathy (Phillips, 2013, p. 635). *Intraoperative hypothermia* is the most common disorder of temperature

homeostasis, and is typically unintentional (Rothrock, 2015, p. 151). Apart from the perioperative *physical* environment, medications administered to the surgical patient such as muscle relaxants and anesthetic agents cause physiological responses that further contribute to increased heat loss (p.539). Even mild hypothermia in the perioperative patient has been associated with: impaired drug metabolism, delayed emergence from anesthesia, prolonged recovery from anesthesia, cardiac morbidity, coagulopathy, impaired wound healing, wound infections, and postoperative shivering. These complications are most often observed in pediatric and geriatric patients under general anesthesia, but are not limited to these demographics (Phillips, 2013, p. 539).

PERIOPERATIVE NURSE CONSIDERATIONS

ORNAC Standards (2015) recommends that the perioperative Registered Nurse shall confirm preoperative patient warming to maintain normothermia (p. 178). It is recommended that all patients having surgery that is expected to last greater than 30 minutes should have a pre-warming initiated between 30 minutes to two hours prior to surgery. The goal of this intervention is to maintain the patient's core temperature at, or above 36 degrees Celsius (ORNAC, 2015, p. 177-178). Methods of maintaining patient temperature include application of warmed fluids and irrigation, warm blankets, forced-air warming devices, as well as increasing operating room air temperature (within facility policy and dependent upon case scenario). The perioperative registered nurse shall initiate preoperative patient warming as per facility policy, apply intraoperative warming devices as outlined by facility policy, and apply post-operative warming devices during transfer to the post-anesthesia care unit (PACU).

Intraoperatively, the perioperative Registered Nurse shall limit exposure of patient's body during surgery to prevent heat loss (ORNAC, 2015, p. 182). Once again, this is achieved by applying appropriate active cutaneous warming systems (ORNAC, 2015, p. 186). Should the case be less than 30 minutes in duration, it is still prudent of the perioperative Registered Nurse to apply at least warm blankets prior to induction, and then again before draping the surgical field.

Postoperatively, the perioperative Registered Nurse will include in the surgical debriefing any concerns the patient experienced in maintaining normothermia. Additionally, any temperature regulation devices should be included in the post-operative plan for the patient (ie: warm blankets or forced-air warming devices). During transfer from the operating room to the PACU, the patient is covered as much as possible with clean, warm blankets, or transient forced-air warming devices are reconnected on the stretcher or patient bed. Finally, a detailed hand-off patient report to PACU should be given, ensuring to include: patient temperature recordings, warming devices used, and any unusual occurrences relating to patient's temperature intraoperatively.

CONCLUSION

Promoting normothermia promotes increased healing and positive post-operative outcomes in the perioperative patient. Patient thermoregulation requires significant personnel, equipment, and time costs, but should be a patient priority in every circumstance. Review of your facility's written policy on patient normothermia during surgery will assist in providing optimal patient care, as well as achieving mandated practice standards. If your facility's policy on patient warming through the perioperative phase does not meet ORNAC 2015 Standards, it is recommended that the unit manager be made aware, and necessary efforts and changes be made.

References

Operating Room Nurses Association of Canada (ORNAC).(2015). *The ORNAC Standards for Perioperative Registered Nursing Practice* (12th).

Phillips, N. (2013). *Berry & Kohn's Operating Room Technique* (12th). St. Louis, MO: Mosby Elsevier.