Non-Invasive Core Temperature Monitoring System: Providing Consistent, Reliable Temperature Measurement in the Perianesthesia Patient

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Background

Maintaining normothermia (core body temperature 96.8° F to 100.4° F) is imperative in the perianesthesia patient. Anesthesia and environmental factors affect the patient's ability to regulate body temperature. An average adult's core body temperature may drop approximately 2.7° F (1.5° C) with general anesthesia. Undetected hypothermia in the perianesthesia setting can increase the incidence of surgical site infection, cardiac arrythmias, blood loss, altered medication metabolism, pain perception, and increase length of recovery time and length of hospital stay.

Problem

One hospital in South Central Pennsylvania identified inconsistent temperature measurement practices throughout each phase of surgical care.

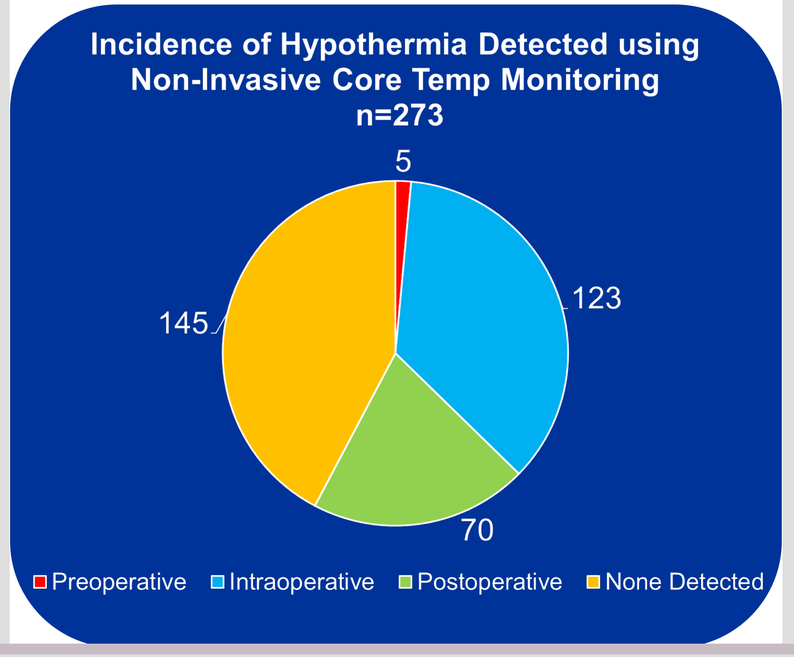
Various forms of temperature measurements were used on the same patient (oral, rectal, temporal-artery, esophageal, and pulmonary artery temperatures). Each of these techniques has varying reliability, which created variability and inconsistency in hypothermia identification and treatment.

Goal

Develop a consistent technique for temperature identification and measurement throughout all phases of surgical care.

Implementation

- Implemented a non-invasive core temperature monitoring (NCTM) system after trial and approval by hospital stakeholders
- NCTM was implemented in all phases of surgical patient care
- Provided initial and ongoing education for all nursing and anesthesia staff members in the perianesthesia and perioperative settings
- Installed new equipment which allows data to flow directly into the EMR
- Created standard workflow for NCTM utilization
- Monitored compliance with proper device use
- Conducted audits related to compliance of use, post operative length of stay, and rate of hypothermia



Outcomes

Initial data indicated a greater volume of hypothermia, previously undetected with less reliable, inconsistently used measures.

- Heightened awareness among staff has increased active warming measures in the PACU prior to discharge
- Prolonged length of stay in PACU has been observed due to increased hypothermia treatment requirements, to meet phase I criteria for discharge
- Highest rate of hypothermia detected in general anesthesia patients undergoing urologic, robotic and general surgical procedures
- Compliance with NCTM in PACU remains inconsistent due to high volume of patients and increased pressure of improving throughput times

Future Implications

- Early identification and intervention for hypothermia is imperative for improved surgical patient outcomes
- The literature lacks recommendations for a standard length of time for temperature monitoring
- Further research is needed regarding thermoregulation after anesthesia and the reoccurrence of hypothermia after active warming measures have ceased
- Pre-warming has been identified as an evidence-based practice to reduce postoperative hypothermia, which has sparked a practice change in the preoperative environment