A Preoperative Forced-Air Warming Protocol to Maintain Post-Operative Normothermia in Colorectal Surgery Patients
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**Problem:** Surgical site infections (SSIs) account for about 40% of all hospital-associated infections. Nearly 3% of postoperative patients develop an SSI, and are twice as likely to die as other postoperative patients. Those with SSIs are also up to 60% more likely to spend time in intensive care. A patient’s thermoregulatory balance is compromised if anesthesia time is greater than one hour. Mild perioperative hypothermia triggers thermoregulatory vasoconstriction and the reduced level of oxygen lowers resistance to infection and impairs wound healing. Research indicated that the incidence of SSIs tripled if a patient became hypothermic in surgery.

**Evidence:** Careful analyses of research articles by Kurtz et al., Danelli et al., and Fossum et al. provide an evidentiary foundation that supports a change in practice to promote normothermia. Surgical site infections are a common and serious complication following major colorectal surgery. The Centers for Medicare & Medicaid Services embarked upon nationwide initiatives (5 Million Lives Campaign) to improve the quality of care provided to patients in hospitals. One of the top priorities selected was the prevention of surgical site infections. In alignment with the SCIP initiatives, performance measurement for surgical infection prevention includes maintaining normothermia to decrease the likelihood of surgical site infections postoperatively. Studies have shown that actively prewarming a patient before surgery helps maintain normothermia postoperatively.

**Strategy:** To improve outcomes, patients undergoing colorectal surgery were warmed with a forced-air warming device for 30 minutes in the pre-operative holding areas to promote post-operative normothermia (>96.8ºF).

**Practice Change:** The specific practice change identified the healthcare providers in the preoperative holding areas. All patients undergoing colorectal surgery are now prewarmed with a forced-air warming blanket for 30 minutes prior to surgery. The operative universal protocol (time-out) documentation now reflects the method of thermoregulation utilized and electronic medical record now documents the initial temperature upon arrival to the Postanesthesia Care Unit (PACU). Patients undergoing vascular surgery are now prewarmed in the preoperative holding area.

**Evaluation:** A pre-operative baseline temperature and the first temperature upon admission to the PACU were recorded. After obtaining IRB approval, a retrospective analysis was performed to obtain baseline data on patients who were in the PACU from July 2007 through December 2008. Data collected included time in and out of PACU, procedure, and temperatures.

**Results:** In the first six months after implementation, 72 patients were reviewed. 66.2% of patients were normothermic (>96.8ºF) immediately post-op. During the following 12 months, 90.5 % of the 227 patients entered PACU normothermic.
Recommendations:
1. Implement a 30-minute preoperative forced-air warming protocol for patients undergoing colorectal surgery.
2. Consider prewarming other patient populations with anesthesia time greater than one hour.

Lessons Learned: Surgical outcomes can be improved through adherence to evidence-based practices. To generalize the findings to a larger patient population, additional research must be done. If the answer is simply about the effects of general anesthesia and its ability to inhibit thermoregulation and produce vasoconstriction, then all patients should be given the advantage of maintaining normothermia during any surgical procedure.

Bibliography:


