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Unintended Perioperative Hypothermia (UPH) is Avoidable

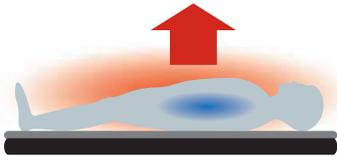
WARM PATIENTS, HOSPITAL WIDE

LEVEL 1[®]

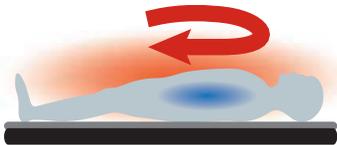
Worldwide leaders in temperature management solutions

Factors Contributing to UPH¹

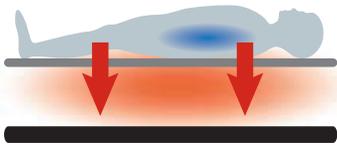
Mechanisms of Heat Loss



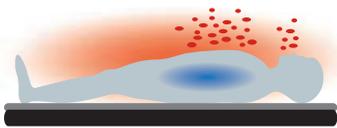
Radiation: All surfaces above absolute zero radiate heat, therefore patients radiate heat into the surrounding environment.



Convection: Surgical settings exchange air more often than normal settings which makes the patients feel colder.



Conduction: Patients in contact with cool surfaces, such as surgical procedure tables, transmit body heat to those surfaces. Wound irrigation and the administration of cold fluids also produces conduction effects.



Evaporation: This typically occurs when sterile preparation solutions are applied. Evaporation losses from surgical wounds may contribute to heat loss as well.

Surgery and Anesthesia Reasons for Heat Loss

General and Regional Anesthesia

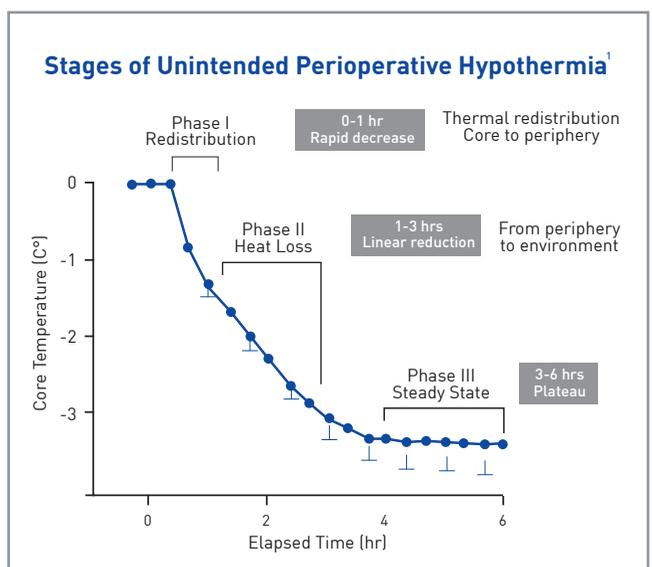
As the primary cause for the inability to maintain body temperature during surgical procedures, general anesthesia prevents vasoconstriction of the blood vessels which normally helps retain body heat. As a result, the patient's heat is redistributed and decreases core body temperature.

Room Temperature

Lower temperatures in surgical settings make it difficult for patients to maintain a normothermic body temperature.

Cold Fluids

Administration of cold intravenous and/or irrigation fluids results in heat loss.



Level 1[®] products help prevent UPH and keep your patients warm, hospital wide.



Forced air warming

Forced air warmers are one of the most effective means of warming a patient and are best used intraoperatively to prevent UPH.¹

Equator[®] Convective Warmer
Snuggle Warm[®] Convective Warming Blankets



Fluid warming

Fluid warmers are commonly used in surgical settings and are recommended whenever blood or large amounts of intravenous or irrigation fluids are administered.¹

HOTLINE[®] Blood and Fluid Warmer
Level 1[®] NORMOFLO[®] Irrigation Fluid Warmer
Level 1[®] Fast Flow Fluid Warmer





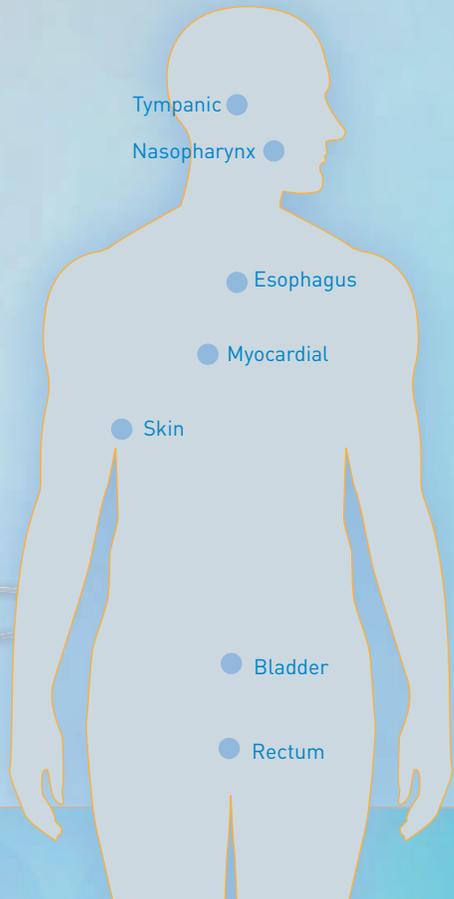
Temperature monitoring

Monitoring patient temperature in the intraoperative setting is a standard of care and plays an integral role for early diagnosis of hypothermia, hyperthermia, and malignant hyperthermia.

- Esophageal stethoscopes
- Skin temperature sensors
- Tympanic temperature sensors
- Myocardial temperature sensors
- General purpose probes
- Foley catheter temperature sensors



Level 1® temperature monitoring placement sites

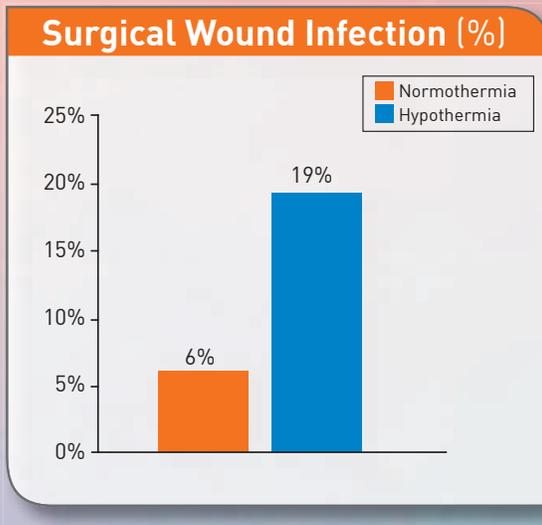


Consequences of UPH

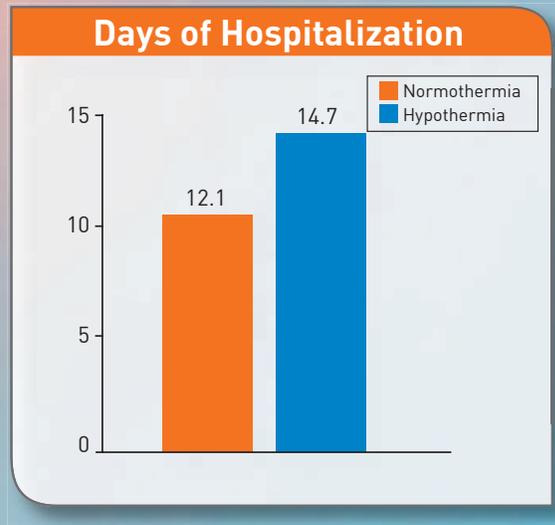
Research has demonstrated a correlation between UPH and a higher incidence of adverse events in surgical patients with core temperatures outside the normal range.²

Results of a 200-patient multicenter trial

Normothermia group - 104 patients Hypothermia group - 96 patients



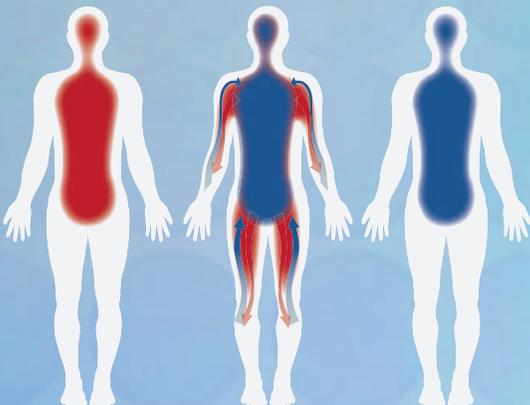
In the normothermia group, only 6 of the 104 patients experienced surgical-wound infections. In contrast, the hypothermia group had a 3-fold increase in this type of infection with 18 out of 96 patients experiencing surgical-wound infections.



Patients in the normothermia group were discharged from the hospital after an average of 12.1 days. Patients in the hypothermia group stayed in the hospital approximately 2.6 days (21%) longer with an average of 14.7 days of hospital stay.

Redistribution of core heat during general anesthesia

UPH occurs when the body's core temperature falls below 36°C



A study in the New England Journal of Medicine showed that **patients with even mild perioperative hypothermia are three times more likely** to acquire surgical site infections than normothermic perioperative patients.²

A meta-analysis found that **adverse outcomes from unintended hypothermia** resulted in prolonged hospital stays and **increased health expenditures** by \$2,500 to \$7,000 per patient.³

Unintended perioperative hypothermia is associated with other forms of **increased morbidity**, including myocardial ischemia, prolongation of drug effects, bleeding diatheses, skin integrity and **length of hospital stay**, and patient satisfaction.¹

Level 1[®] products help prevent unintended perioperative hypothermia

FORCED AIR WARMING

FLUID WARMING

TEMPERATURE MONITORING

WARM PATIENTS, HOSPITAL WIDE



Contact your local Smiths Medical representative for more information

References:

1. Hart SR, Bordes B, Hart J, Corsino D, Harmon D. Unintended Perioperative Hypothermia. The Ochner Journal. 2011;11:259-270
2. Kurz A, Sessler DI, Lenhardt R. Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. New England Journal of Medicine 1996;334: 1209-1215.
3. Mahoney C and Odom J. Maintaining intraoperative normothermia a meta-analysis of outcomes with costs. AANA 1999;67:155-164.

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