



## **Guideline Statement for the Maintenance of Normothermia in the Perioperative Patient**

### **Introduction**

The maintenance of normothermia in the perioperative patient is essential during all phases of the surgical procedure. Measures to monitor and maintain body temperature should begin in the preoperative phase and continue into the postoperative phase of the surgical procedure. The monitoring of patient temperature is the responsibility of all surgical team members and not just the anesthesia provider.

### **AST Guideline Statement**

Maintaining normothermia in the perioperative patient is a collaborative effort between the anesthesia provider, the surgeon, perioperative personnel, and perianesthesia personnel.

### **Maintaining Perioperative Normothermia**

Perioperative temperature management is imperative to positive surgical outcomes. The body maintains its temperature between 36°C and 38°C by balancing heat production and heat loss. The thermoregulatory mechanisms in the central nervous system (CNS) control this function. The body loses heat through radiation (from tissues), conduction (contact with cool surfaces), evaporation (respiration), and convection (exposure to the environment). Intraoperative hypothermia is one complication for patients receiving general anesthesia, especially in geriatric and pediatric populations. Under anesthesia, the average adult loses 0.5° to 1.5°C (0.9° to 2.7°F), and the greatest heat loss occurs during the first hour of anesthesia. The maintenance of normothermia during the intraoperative period prevents complications associated with hypothermia.

Hyperthermia during the surgical procedure can be caused by dehydration, fever, pre-medication, excessive drapes, and a closed anesthesia breathing circuit. In some instances, the surgical procedure may be delayed to permit fluid administration and a reduction in patient temperature, including discontinuing the use of any warming devices. The patient's body temperature should be continuously monitored throughout the surgical procedure in order to assess metabolic changes.

### **Risk Factors for Hypothermia**

- Large volume of irrigation
- Major blood or fluid loss
- Exposure of a large body cavity
- Patient's age
- Patient's physical status and preexisting conditions
- Cold surgical environment
- Length and type of surgical procedure

- Type of anesthesia

### **Complications Associated with Hypothermia**

- Coagulopathy
- Altered metabolism, ie metabolic acidosis
- Wound infections
- Shivering
- Cardiovascular effects
- Surgical bleeding

### **Example Protocol for Preventing Hypothermia in the Surgical Patient**

1. Limit the amount of skin exposed during all phases of the surgical procedure.

**Suggestions:** Surgical team members coordinate efforts to keep patient covered and warm during the preoperative and postoperative phases with the use of warm blankets or warming devices.

2. Monitor patient's temperature during all phases of the surgical procedure.

**Suggestions:** This is primarily a role of the anesthesia provider, but the circulator or surgical assistant can provide assistance in monitoring the patient's temperature by checking the temperature surface monitor that is placed on the patient's forehead.

3. Use warmed irrigation and infusion fluids/solutions.

**Suggestions:** The CST and CFA should use irrigation fluids obtained from the blanket and solution warmer located in the substerile room.

4. Use of warmed anesthetic gases

**Suggestions:** The anesthesia provider is responsible for this function.

5. Monitor operating room temperature and humidity closely.

**Suggestions:** The CST and CFA should follow established recommendations for temperature and humidity levels in the operating room, and periodically check and record these levels for each operating room.

6. Utilize heat-maintenance devices (head coverings, leggings, forced-air warming systems, hypothermia/hyperthermia mattress, reflective blankets/head coverings, radiant heat sources).

**Suggestions:** The CST and CFA should know the proper procedures for operating warming devices and the safety protocol associated with the use of any type of warming device as established by hospital policy and manufacturer's recommendations.

## Competency Statements

Competency Statement	Measurable Criteria
<p>1. CSTs and CFAs are qualified to identify potential complications, associated with hypothermia and hyperthermia in the perioperative environment, and appropriate interventions for treatment.</p>	<ol style="list-style-type: none"> <li>1. Educational standards as established by the <i>Core Curriculum for Surgical Technology</i>.<sup>1</sup></li> <li>2. The subject areas of normothermia, hyperthermia and hypothermia are included in the didactic studies as a student.</li> <li>3. The proper use of thermoregulatory methods and devices is included in the didactic studies as a student.</li> <li>4. Students demonstrate the proper application of thermoregulatory methods during clinical rotation, including the proper use and operation of thermoregulatory devices, and are evaluated by preceptors and instructors.</li> <li>5. CSTs and CFAs perform patient care duties by applying thermoregulatory methods and devices in the perioperative setting as practitioners.</li> <li>6. CSTs and CFAs identify potential patient complications associated with the use of thermoregulatory methods and devices in the perioperative setting as practitioners, including contributing to the decision-making process of proper interventions to treat hyperthermia and hypothermia.</li> <li>7. CSTs and CFAs complete continuing education to remain current in their knowledge of hyperthermia, hypothermia, and maintenance of normothermia for the surgical patient.</li> </ol>

## Definitions

**Core Temperature:** A temperature of the interior of the body, ranging from 36.8° to 37.7°C (98° to 100°F)

**Normothermia:** A core temperature range of 36°C to 38°C (96.8°F to 100.4°F)

**Hypothermia:** A core temperature less than 36°C (96.8°F)

**Hyperthermia:** A core temperature greater than 38°C (100.4°F)

**Unplanned perioperative hypothermia:** An unexpected core temperature decrease to less than 36°C (96.8° F) as a result of surgery

## References

1. *Core Curriculum for Surgical Technology*. 5<sup>th</sup> ed. Littleton, CO: Association of Surgical Technologists; 2002.
2. DeFazio-Quinn DM, Schick L, eds. *PeriAnesthesia Nursing Core Curriculum: Preoperative, Phase I and Phase II PACU Nursing*. St Louis, MO: WB Saunders; 2004.
3. Drain CB. *Perianesthesia Nursing: A Critical Care Approach*. 4<sup>th</sup> ed. St Louis, MO: WB Saunders; 2003.
4. Frey K, Ross T eds. *Surgical Technology for the Surgical Technologist: A Positive Care Approach*. 3<sup>rd</sup> ed. Clifton Park, NY: Delmar Cengage; 2008.
5. Meeker M, Rothrock J, eds. *Alexander's Care of the Patient in Surgery*. 12<sup>th</sup> ed. St. Louis, MO: CV Mosby; 2003.
6. Phillips N. *Berry & Kohn's Operating Room Technique*. 10<sup>th</sup> ed. St Louis, MO: 2004.
7. Wagner VD. Impact of perioperative temperature management on patient safety. *Surgical Services Management*, 2003; 9 (4): 38-43.