



KIMBERLY-CLARK*
Patient Warming System



*Superior warming and improved
outcomes mean one less worry.*



Kimberly-Clark

*Trusted Clinical Solutions**

Hypothermia occurs in the majority of surgical patients¹

Even mild hypothermia (-1.5°C) severely impacts morbidity, mortality, and costs

- A meta-analysis across multiple surgery types found that mildly hypothermic patients were at significantly increased risk of infection, myocardial infarction, transfusion, prolonged ventilation, and mortality.²

Adverse effects in complex surgery:

- A study on CABG demonstrated significant differences in impaired wound healing, adverse cardiac events, altered drug metabolism, coagulopathies, and increased ICU/hospital stays.³

“Maintaining normothermia can be challenging in complex, large surgical field procedures (such as OPCAB) and may require more efficient methods than forced air.”¹



“The optimal approach to perioperative temperature management is to prevent patients from ever becoming hypothermic.”¹

The standard of care in complex surgery is to maintain normothermia

However, improved strategies are needed to decrease the incidence of surgical hypothermia.

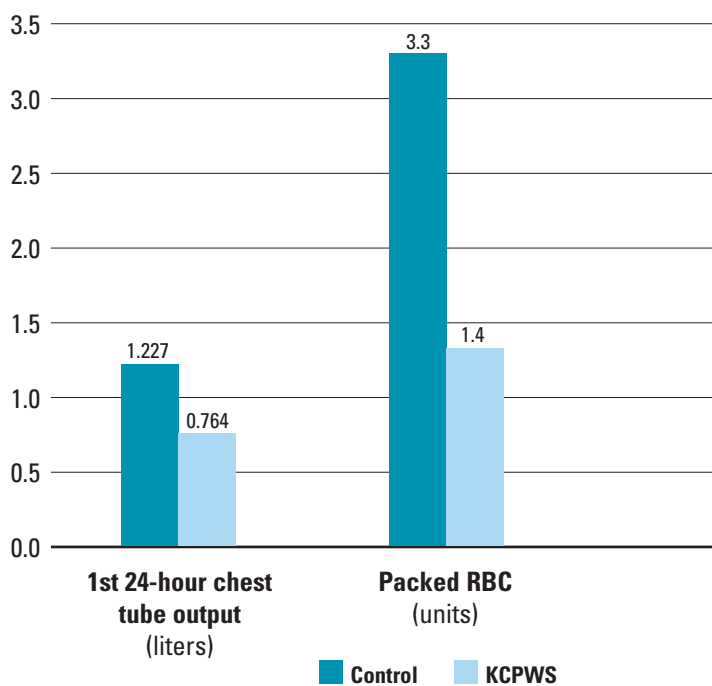
- According to the American Society of PeriAnesthesia Nurses (ASPAN) temperature regulation is often “inadequate.”⁴

Hospital costs have been shown to increase up to \$7,000 USD per patient²

The ideal non-invasive thermal management system designed for complex surgery

KIMBERLY-CLARK* Patient Warming System vs Current Techniques

Significant benefits shown in an OPCAB study (N=69, p<0.05)⁵



■ **39% Reduction in chest tube output**

■ **58% Reduction in Packed Red Blood Cells used**

Other Significant Findings:

■ **40% reduction in time to extubation**

■ **35% reduction in ICU stay**

■ **15% decrease in hospital stays**

Another study in OPCAB cardiac surgery (N=29)⁶

- Significantly reduced hypothermia vs control, even without additional temperature modulating techniques (fluid warming, ambient room temperature increases, etc.)

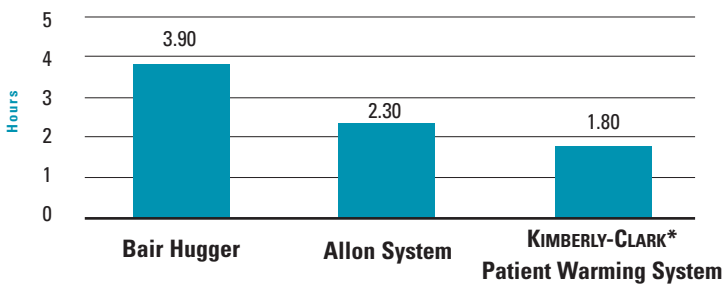
A study in on-pump CPB (N=42) showed:⁷

- Warmer arrival at the ICU (36.6 ± 0.5 vs $35.4 \pm 0.9^\circ\text{C}$, $p < 0.001$)
- Less afterdrop (patients $< 37^\circ\text{C}$, 0.5 ± 0.5 vs $1.7 \pm 0.7^\circ\text{C}$, $p < 0.001$)

**KIMBERLY-CLARK* Patient Warming System
Compared to other modalities**

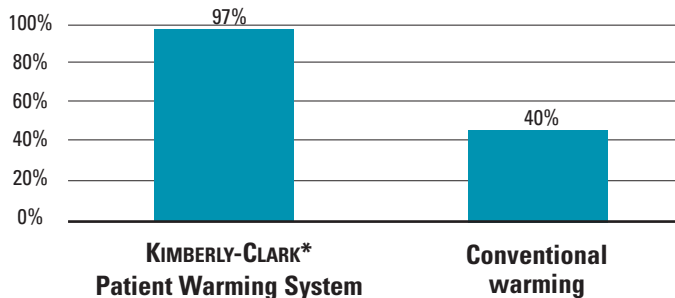
FASTER

**Time required to increase core temperature
from 34°C to 36°C⁸**



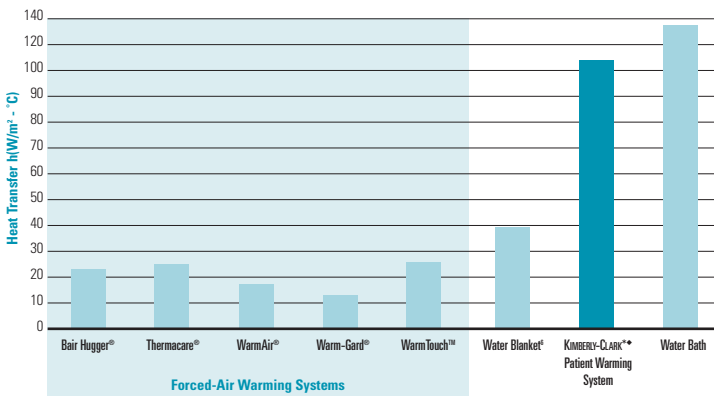
MORE EFFECTIVE

**Returns patients to normothermia significantly
more effectively than conventional warming^{†9}**
(p<0.001)



MORE EFFICIENT

Provides superior heat transfer performance¹⁰



“The Kimberly-Clark energy transfer pads were more effective than either the Allon circulating water garment or the Bair Hugger forced-air warming blanket in this volunteer model...”⁸

[†]Despite significantly lower OT temperatures in the KIMBERLY-CLARK* Patient Warming System group (due to uneven randomization), the system maintained higher bladder and nasopharyngeal temperatures.⁹

KIMBERLY-CLARK* Patient Warming System consist of two simple elements

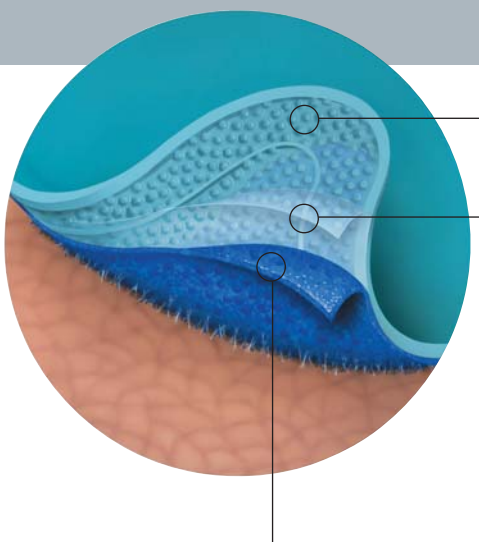
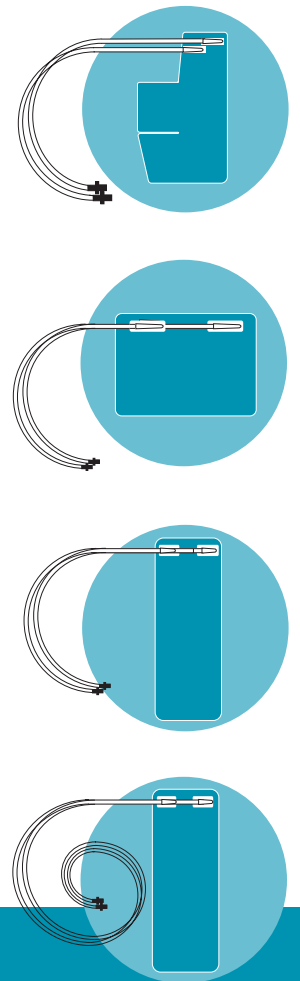
The Control Unit

- **Small, portable, easy-to-use unit allows precise ($\pm 0.5^{\circ}\text{C}$), automated or customizable temperature management**
- **Negative-pressure design prevents accidental leaks, ensuring sterile field maintenance**
- **Effective as a single stand-alone device — no need for blankets or additional devices**



Innovative Thermal Pads

- Various pad sizes allow placement on nearly all body surfaces — ideal for a wide variety of patients and surgical procedures
- Normothermia is safely maintained with only 20% of patient's skin covered
- Provides an optimal energy transfer path — heat is conducted directly through skin through advanced, 3-layer, non-slip, hydrogel pads



The **outer foam layer** prevents energy loss in the environment and contains channels for the circulating water.

The **middle layer** is an ultra thin polymeric film that seals in the fluid channels without interfering with the energy transfer.

The **inner hydrogel layer** is a medical-grade, biocompatible material containing 50% water.

Built-in safety systems ensure peace of mind while improving patient outcomes

- **Automatic computer-controlled algorithm avoids warming patients above normal range and prevents temperature spikes**
- **Thermal pads feature a thin, conformable, foam & gel construction**
- **System is designed not to leak, even if punctured or cut**
- **Disposable non-sterile pads can be kept away from the sterile field, avoiding the danger of a sterile breach**

Use safely in the OT

Won't disrupt grounded signaling systems, physiological monitoring systems, electro-surgical units, and defibrillation devices

KIMBERLY-CLARK* Patient Warming System



An effective way to
improve patient
outcomes

- ✓ Fewer transfusion requirements
- ✓ Less post-operative bleeding
- ✓ Less mechanical ventilator time
- ✓ Less ICU time
- ✓ Less hospital time

Superior warming and improved outcomes mean one less worry.

A more comfortable and efficient OT environment

- Permits comfortable OT ambient temperature, so the OT team sweats less, focuses on surgery
- Eliminates the need for additional temperature modulating devices, such as forced air, a warm room, water blankets, and heat lamps
- Reduces hospital resources otherwise occupied managing post-operative hypothermia

Real-world cost savings

A cost benefit analysis revealed that hospitals can save up to \$743,570 USD per year with the KIMBERLY-CLARK* Patient Warming System in place of current practices^{††}

Real-world convenience

- User friendly interface allows for easy programming
- Control unit has a small footprint to minimize interference with other OT devices
- Wheels allow easy transportability between OT and recovery rooms

^{††}Data on file. Based on the cost savings resulting from the improved patient outcomes versus traditional warming methods.

KIMBERLY-CLARK* Patient Warming System



Solves thermal management for complex surgeries, such as cardiovascular, organ transplant, trauma, major abdominal, orthopaedic or any procedure involving access to large surface areas or open cavities.

KIMBERLY-CLARK* Patient Warming System An ideal solution for complex surgeries

Effective

- Improves patient outcomes
- 5 times more efficient than forced air warming

Safe

- Thin, conformable foam & gel pads

Simple

- Portable and easy to use—without the need of additional warming devices



At Kimberly-Clark, our mission is to deliver clinical solutions that you can depend on to meet the demands of your fast-paced world. Whether your needs involve preventing healthcare-associated infections, surgical and digestive solutions or pain management, with Kimberly-Clark you'll always have one less worry.



Healthcare-Associated Infection Solutions



Surgical Solutions



Digestive Health



Pain Management



Commitment to Excellence

If, for any reason, our products do not meet your expectations, please let us know your comments or suggestions for improvement. Your input will result in a concerted effort on our part to meet your requirements. Our goal is to provide quality products that completely meet your needs time after time.

For more information, please call your Kimberly-Clark representative or visit our web site at www.kchealthcare.com

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1. Katariya K, Robinson S, Sessler DI, Kurz A, Hodges WE, Odom-Forren J. Special Report. Roundtable Summary: Perioperative Temperature Management. New York, NY: McMahon Publishing Group.; 2005.
2. Mahoney CB, Odom J. Maintaining intraoperative normothermia: A meta-analysis of outcomes with costs. *AANA J.* 1999;67(2):155-163.
3. Insler SR, O'Connor MS, Leventhal MJ, Nelson DR, Starr NJ. Association between postoperative hypothermia and adverse outcome after coronary artery bypass surgery. *Ann Thorac Surg.* 2000;70:175-181.
4. Hypothermia Guideline: Clinical Guideline for the Prevention of Unplanned Perioperative Hypothermia page. ASPAN American Society of PeriAnesthesia Nurses Web site. Accessed 12/2/2005. Available at <http://www.aspan.org/hypothermia.htm>.
5. Woo AJ, Atluri P, Grand TJ, Hsu VM, Cheung A. Active thermoregulation improves outcome of off-pump coronary artery bypass. *Asian Cardiovasc Thorac Ann* 2005;13:157-160.
6. Grocott HP, Mathew JP, Carver EH, et al. A randomized controlled trial of the Arctic Sun Temperature Management System versus conventional methods for preventing hypothermia during off-pump cardiac surgery. *Anesth Analg.* 2004;98(2):298-302.
7. Playford H, Frumento R, mongero L, et al. Evaluation of postoperative parameters of the intraoperative use of the Arctic Sun temperature-controlling system in cardiac surgery. *Anesthesia & Analgesia.* 2004;98(Suppl 4) Abstract SCA117.
8. Barnes P, Wadhwa A, Komatsu R, Orhan-Surgur M, Sessler DI. Comparison of three surface warming methods: Direct conduction thermal pads, circulating water garment, and forced-air blanket. Poster presented at ASA, October, 2005.
9. Vasiliades, Thomas A., Nielsen, James L, Londquist, James L. Evaluation of a new temperature management system during off-pump coronary artery bypass. *Interactive Cardiovascular and Thoracic Surgery* 2. 2003; 454-457.
10. Brauer A, English MJ, Steinmetz N, et al. Comparison of forced air warming systems with upper body blankets using a copper manikin of the human body. *Acta Anaesthesiol Scand.* 2002; 46:965-972.

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