

3M Infection Prevention
Cardiothoracic & Vascular Temperature Management



Cardiothoracic & Vascular Surgery

Temperature Management Strategies

Warming patients who are undergoing complex surgical procedures should not be complicated. 3M™ Bair Hugger™ therapy offers a number of easy to use blanket designs to actively warm—and rewarm—your most challenging cases, from pediatric to geriatric, without compromising surgical access.

3M Infection Prevention Solutions

Innovation
On A Mission

3M

3M™ Bair Hugger™ Therapy

Access From the Start

3M™ Bair Hugger™ therapy offers multiple warming solutions for cardiothoracic and vascular surgeries in pediatric and adult patient populations.

Underbody series blankets are placed on the OR table prior to the patient's arrival. This allows the care provider to focus on the patient and warm from the start of the procedure. As little as 15 minutes of forced-air warming prior to induction can add to the total heat content of the body helping to reduce the effects of redistribution temperature drop^{1,2} for procedures using a normothermic temperature management strategy.

The pediatric underbody blanket (model 555) and the large pediatric/small adult underbody blanket (model 550) offer excellent warming solutions for smaller patients. The full access underbody blanket (model 635) is ideally suited for the adult cardiothoracic or vascular surgery patient where unrestricted patient access is a requirement.

Temperature Management for Cardiothoracic and Vascular Surgery

Bair Hugger underbody series blankets will accommodate supine, lateral or prone positions and are suitable for use with either endovascular or open SVG harvesting techniques. Because the full access underbody blanket is in place under the surgical drapes, forced-air warming can be used to complement cardiopulmonary bypass rewarming strategies. The same blanket can be used to continue warming therapy after the patient has been weaned from bypass.

The full access underbody series blanket has been demonstrated to be more effective than a water mattress.^{2,3} Forced-air warming can also be used without the risk of thermal injury associated with conductive warming devices as a result of the combination of pressure, time and heat.⁴ Unlike with water mattresses, the patient's natural pressure points compress the forced-air underbody blanket preventing heat from reaching potentially ischemic tissue – areas that

Warm every patient

are at risk for pressure sore formation and thermal injury. All Bair Hugger underbody series blankets include unique drain holes that allow excess fluids to pass through the surface of the blanket to the linen below, reducing the potential for skin maceration or breakdown or inadvertent cooling⁵ of the surgical patient due to evaporative heat loss.

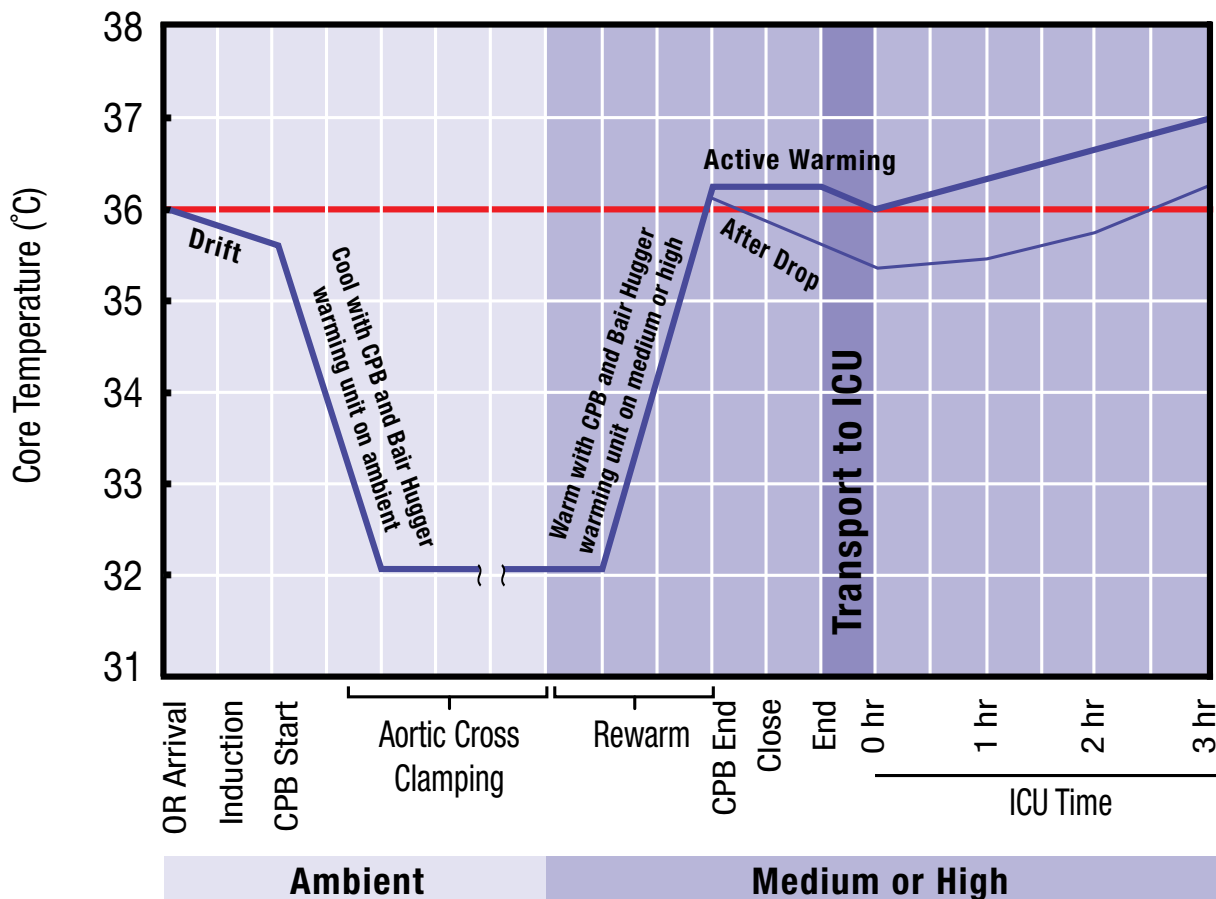
Bair Hugger temperature management units can be used to both actively warm or cool patients. In hypothermic bypass, the ambient setting may be used to complement CPB patient cooling while the medium and high settings can be used to complement

CPB patient rewarming.

Maintaining normothermia with forced-air warming has been shown to reduce the rate of complications such as:⁶

- Surgical site infection rates
- Post operative cardiac events
- ICU time
- Length of hospital stay
- Mortality rates
- Coagulopathy and transfusion of blood product
- Mechanical ventilation time

Temperature Management in Hypothermic Cardiac Surgery⁷



Adapted from: Hohn L, et al. Benefits of intraoperative skin surface warming in cardiac surgical patients. *British Journal of Anaesthesia*. 1998; 80(3): 318-323.



Pediatric Underbody
Model 555



Large Pediatric Underbody
Model 550



Sterile Cardiac
Model 630

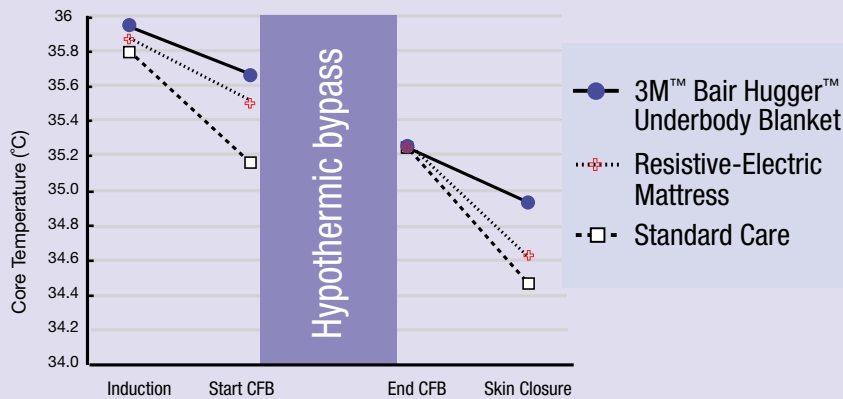


Cummberrbund design allows for placement onto patient after surgical preparation.

Full Access Underbody
Model 635



External warming methods following hypothermic bypass⁸



Adapted from: Engelen S., et. al. A Comparison of Under-Body Forced-Air and Resistive Heating During Hypothermic Bypass. *ASA Abstract*, 2010. A075.

On- and Off-Pump

Both on-pump and off-pump cardiothoracic and vascular procedures have demanding temperature management requirements.

Whether your surgical strategy involves near normothermic bypass or CPB-induced hypothermia where reducing the severity of post-bypass after drop is of concern, Bair Hugger therapy has demonstrated, flexible temperature management solutions designed to help you meet your patient temperature goals.

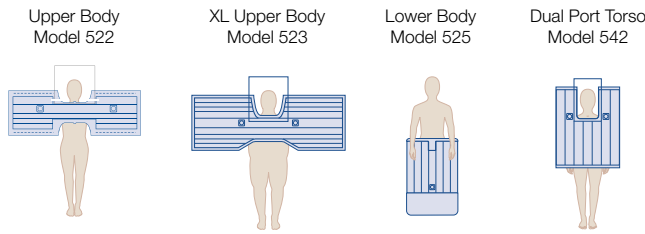
Bair Hugger underbody series blankets:

- Are significantly more effective at reducing unintended hypothermia following hypothermic CABG than resistive-electric type mattresses.⁸
- Are effective at preventing hypothermia and the harmful effects of hypothermia in the early postoperative phase in patients undergoing near-normothermic CABG.⁹
- Have been adopted for use in fast-track cardiac surgery to ensure a core temperature of 36°C.¹⁰

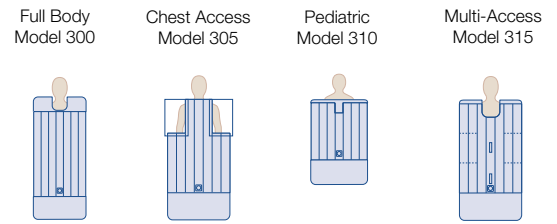
Studies have demonstrated that convective Bair Hugger underbody forced-air warming blankets produce superior intraoperative warming results when compared to conductive under-the-patient water mattresses^{1,5,11} or resistive-electric type heating mattress pads.⁸



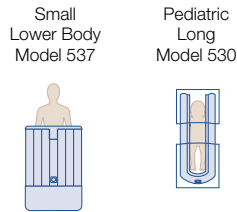
INTRAOPERATIVE BLANKETS



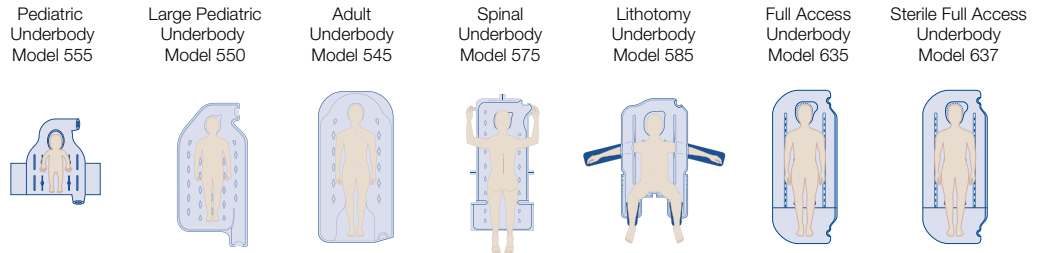
POSTOPERATIVE BLANKETS



PEDIATRIC BLANKETS*

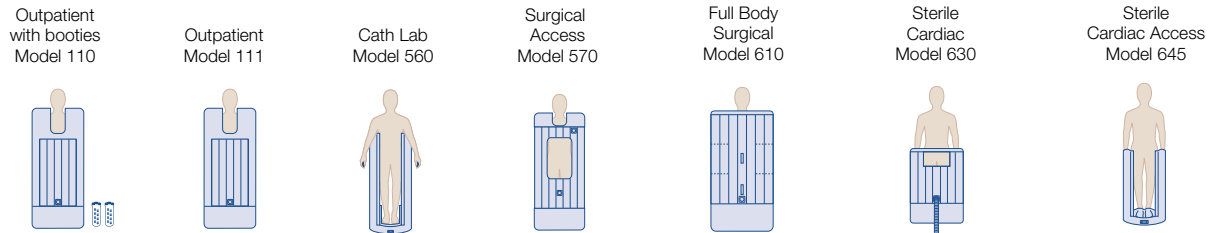


UNDERBODY SERIES



*Also see Underbody Series & PACU blankets

SPECIALTY AND CARDIAC BLANKETS



References:

1. Sessler DI. Current concepts: mild perioperative hypothermia. *N Eng J Med*, 1997; 336: 1730-1737.
2. Tominaga A, et. al. Efficacy of an Underbody Forced-Air Warming Blanket for the Prevention of Intraoperative Hypothermia. *Anesthesiology*, 2007; 107: A91.
3. Ouchi T, et. al. Lithotomy Air Blanket can Prevent Intraoperative Redistribution Hypothermia. *ASA Abstract*, 2010; A088.
4. Kokate JY, et. al. Temperature-modulated pressure ulcers: a porcine model. *Arch Phys Med Rehabil*, 1995; 76: 666-73.
5. Lin EP. Wet forced air blankets are ineffective at maintaining normothermia. *Paediatric Anesthesia*, 2008; Jul;18(7):642-4.
6. Mahoney CB, Odom J. Maintaining intraoperative normothermia: A meta-analysis of outcomes with costs. *AANA Journal*, 1999; 67(2): 155-164.
7. Hohn L, et. al. Benefits of intraoperative skin surface warming in cardiac surgical patients. *British Journal of Anaesthesia*, 1998; 80: 318-323.
8. Engelen S, et. al. A Comparison of Under-Body Forced-Air and Resistive Heating during Hypothermic Bypass. *ASA Abstract*, 2010; A075.
9. Teodorczyk JE, et. al. Effectiveness of an Underbody Forced-Air Blanket in Preventing Postoperative Hypothermia after Coronary Artery Bypass Graft Surgery with Normothermic Cardiopulmonary Bypass. *Critical Care*, 2009; 13 (Suppl 1):P71.
10. Ender J, et. al. Cardiac Surgery Fast-track Treatment in a Post-anesthetic Care Unit: Six-month Results of the Leipzig Fast-Track Concept. *Anesthesiology*, Jul 2008; No 1, V 109:61-6.
11. Ong BC. A Prospective, Randomized and Controlled Clinical Trial using Parallel Design to Evaluate the Efficacy of Forced-Air Warming Bair Hugger Full Access Underbody Blanket in Maintaining Body Temperature as Compared to Circulating Water Warming Mattress and Forced-Air Warming Bair Hugger Cath Lab (U-Shape) Blanket in Coronary Artery Bypass Graft (CABG) Surgery. *SGH Proceedings*, 2009; Vol 18, No. 1 (Suppl):S39:1500.

Pediatric Warming Solutions

ACHIEVE
SCIP-Inf-10
GOALS



Complete Pediatric Warming



3M Infection Prevention Solutions

Innovation
On A Mission



You know the importance of keeping your littlest patients warm, so why trust them to anyone but the leader in patient warming? We created forced-air warming and offer surgical warming designed specifically for pediatric patients.

Trust the leader in patient warming



3M™ Ranger™ System Pediatric Fluid Warming

The 3M™ Ranger™ pediatric/neonate blood and fluid warming disposable set is an excellent temperature management option for pediatric warming.

The Ranger blood and fluid warming system adapts to virtually any fluid warming need from KVO to 30,000 mL per hour. The Ranger system utilizes dry heat rather than water and offers intuitive, simple solutions to the most complex fluid warming needs.

- DEHP-free and designed for fluid delivery from KVO to 6,000 mL/hr and aliquot fluid administration via syringe
- Priming volume of 20 mL
- Includes a fluid aspiration port



**Pediatric/Neonate
Disposable Set with
Fluid Aspiration Port**
Model 24450



Warming Unit
Model 24500





3M™ Bair Hugger™ Therapy Pediatric Blankets

Large Pediatric Underbody blanket
Model 55000

Four unique forced-air warming blankets—including two underbody series models, one lower body model and one full body model—are sized just right for your pediatric patients, from neonates to young adults.

Both Bair Hugger underbody series pediatric blankets provide full access to the patient and feature unique fluid outlets and consistent, even perforations across the entire surface to ensure safe and effective warming. These blankets also include two drapes that help retain warm air surrounding the intubated patient.



Unique Fluid Outlets



Pediatric Blanket
Model 31000



Small Lower Body Blanket
Model 53700



Pediatric Underbody Blanket
Model 55501



3M™ Bair Paws™ Pediatric Warming Gown

The 3M™ Bair Paws™ system revolutionized forced-air warming by providing clinicians options for comfort and clinical warming throughout the perioperative process in one convenient gown. Now the Bair Paws system offers a pediatric gown, providing a way to warm and comfort some of the smallest surgical patients.

The Bair Paws pediatric gown features dual air-channel inserts enabling prewarming and comfort warming with a Bair Paws 800 series warming unit, or clinical warming with a 3M™ Bair Hugger™ 500 or 700 series temperature management unit.

- The pediatric gown accommodates children over 40 inches tall
- Designed to be used in the pre-op, OR* and PACU



**Pediatric
Warming Gown**
Model 81501

* select surgical procedures

3M Ranger System Pediatric Fluid Warming



Warming Unit
Model 24500

Set point temperature: 41°C
Flow rates: KVO – 30,000 mL/hr
Over temperature set points:
Primary: 43°C Secondary: 44°C
Power: 110-220VAC/220-240VAC
Weight: 7 lbs. 7 oz.
Dimensions: 7.5" w × 4.5" h × 10" d
(19 × 11 × 25 cm)



Pediatric/Neonate Disposable Set with Fluid Aspiration Port
Model 24450

Flow rates: KVO - 6,000 mL/hr
Priming volume: 20 mL
Components: Heat exchanger, bubble trap with air aspiration port, fluid aspiration port, patient line
Pressure infusion: Up to 300 mmHg
Sterile: EtO
Cassette: DEHP-free cassette, Latex free
Use: Single use only
Units/case: 10

3M Bair Paws Pediatric Warming Gown



Warming Unit
Model 87500

Dimensions : 13" high x 7.7" wide x 4" deep (33 cm high x 19.6 cm wide x 10.2 cm deep)
Weight: 7.0 lb (3.2 kg)
Operating Temperatures: User adjustable from ambient to 43° ± 3°C
Filter: Dust filter
Device Ratings:
110-120 VAC, 50/60 Hz, 4.6A
220-240 VAC, 50/60 Hz, 2.8A



Pediatric Warming Gown
Model 81501

Size: 33" length and 40" sweep
Units/case: 20
Ideal for children over 40" tall

Complete pediatric temperature management

3M Bair Hugger Therapy Pediatric Blankets



Warming Unit
Model 77500

Dimensions: 13h x 14w x 13d in (33h x 36w x 33d cm)
Weight: 16 lb (7.3 kg)
Operating Temperatures: ± 1.5°C
High: 43°, Med: 38°, Low: 32°
Leakage Current: Meets UL 60601-1 and IEC 60601-1 requirements
Filter: High-efficiency 0.2 µm air filter
Device Ratings: 110-120 VAC, 50/60 Hz, 11.7 Amperes; 220-240 VAC, 50/60 Hz, 7.2 Amperes; 100 VAC, 50/60 Hz, 15 Amperes



Pediatric Blanket
Model 31000

Size: 60" x 36" (152 x 91 cm)
Weight: 4.8 oz (134 g)
Units/case: 10



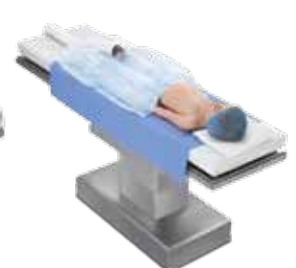
Large Pediatric Underbody Blanket
Model 55000

Size: 60" x 32" (152 x 81 cm)
Weight: 4.8 oz (136 g)
Drape (2): 24 x 24 in (61 x 61 cm)
Units/case: 10



Pediatric Underbody Blanket
Model 55501

Size: 36" x 33" (91 x 84 cm)
Weight: 3.0 oz (85 g)
Drape (2): 24 x 24 in (61 x 61 cm)
Units/case: 10



Small Lower Body Blanket
Model 53700

Size: 35 x 24 in (89 x 61 cm)
Weight: 1.5 oz (43 g)
Units/case: 10

3M™ Bair Hugger™ Therapy
Underbody Series Blankets

ACHIEVE
SCIP-Inf-10
GOALS



Forced-air Warming Reinvented from Below

In procedures involving general or regional anesthesia, maintaining body temperature is crucial. Any surgical patient can lose approximately 1.6°C during just the first hour of surgery alone.¹ Hypothermia can also increase the risk of infection,² longer hospital stays³ and death.⁴ For routine to complex surgeries, the 3M™ Bair Hugger™ underbody series blankets offer warming solutions to meet your needs.

Lead
theWay



Who should be warmed? Everyone.

Patients under general or regional anesthesia cannot regulate their own temperature. Core body temperature declines by as much as 1.6°C within the first hour following the induction¹ of anesthesia, increasing the associated risks of unintended hypothermia such as higher mortality rates,⁴ longer hospital stays³ and an increased rate of wound infection.²

Forced-air warming is a simple, cost-effective method to prevent unintended hypothermia and its complications. Maintaining perioperative normothermia is also cited by healthcare initiatives around the world as a key factor in reducing the rate of surgical site infections.

Characteristic Patterns Of General Anesthesia Induced Hypothermia

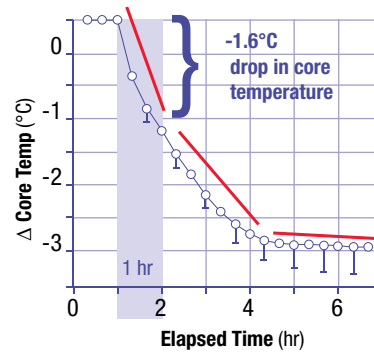
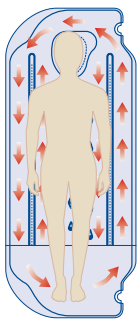


Chart adapted from: Sessler, DL., Perioperative Heat Balance. *Anesthesiology*, V92, No. 2, Feb 2000.

Simple, cost-effective protection against hypothermia

Forced-air Warming Using an Underbody Blanket*

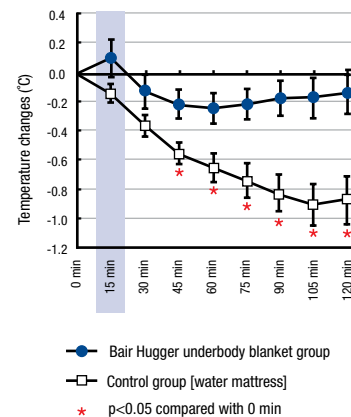


Outer channel surrounds the patient directing warmth to both the core and periphery

- Prevents the initial temperature decrease caused by redistribution temperature drop.⁵
- Effective in preventing hypothermia during abdominal surgery.⁵
- Recruits greater body surface area and is more effective in preventing hypothermia during abdominal surgery than an upper body blanket.⁵
- More effective in preventing hypothermia than water mattress devices during abdominal surgery.⁵

*As studied in upper abdominal surgery

Changes in esophageal temperature⁵ (As studied in upper abdominal surgery)



● Bair Hugger underbody blanket group
 □ Control group [water mattress]
 * p<0.05 compared with 0 min

Underbody Series Blankets

Adult Underbody Blanket 545

Designed for the Cardiac Cath Lab and Interventional Radiology. This radiolucent blanket is positioned on the table as the room is turned over for the next patient so it's ready for immediate use.



Pediatric Underbody Blankets 555/550

Specifically for pediatric patients from neonate to young adults, eliminates the need to adapt products and equipment for pediatric use.



Spinal Underbody Blanket 575

Designed for the challenging patient positioning created by the open frame of the spinal surgery table. This design does not interfere with the adjustment of support pads and allows full patient visualization.



Lithotomy Underbody Blanket 585

Allows the clinical flexibility and full access needed for procedures involving the lower extremities and the abdominal, peritoneal and pelvic cavities.



Full Access Underbody Blankets 635/637

Ideal for trauma, cardiac, complex or routine surgeries when the patient is in the supine, lateral or prone positions. Also available as a sterile blanket (Model 637) for cosmetic and reconstructive procedures.



Full access from the start

Underbody Series Blanket Benefits

- 1 **Simplified OR prep** Placing the underbody series blankets on the table before the patient arrives in the OR allows immediate warming and more time for other pre-surgical tasks.
- 2 **Designed for flexibility** The unique design of the underbody series offers clinicians full, unrestricted access and flexible positioning for virtually any procedure.
- 3 **Innovation** Fluid outlets minimize the pooling of fluids while the patient's natural pressure points compress the blanket, preventing heat from reaching potentially ischemic tissue. Consistent, even perforations in the soft, radiolucent materials ensure uniform convective warming.
- 4 **From the leaders in forced-air warming** We created the category of forced-air warming in 1987 and today offer 25 blanket styles – the most complete portfolio in the industry.
- 5 **Proven performance** More than 165 million patients across the globe have experienced the benefits of Bair Hugger therapy.
- 6 **Meets SCIP-Inf-10 goals** Use of underbody series blankets meets the active warming requirement of the CMS normothermia measure. Under the measure, facilities must either use an active warming modality or achieve a temperature of at least 36°C within 30 minutes before or 15 minutes after anesthesia end time.⁶

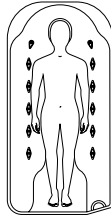


For routine to complex surgeries,

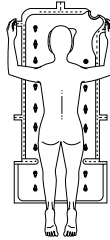
the benefits of maintaining normothermia are clear
and so easy to achieve with Bair Hugger therapy.

Bair Hugger Therapy Underbody Series Blankets

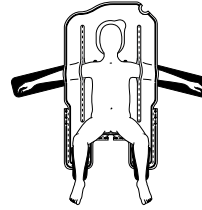
Adult Underbody
Model 545



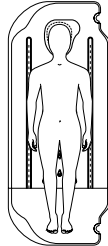
Spinal Underbody
Model 575



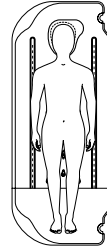
Lithotomy Underbody
Model 585



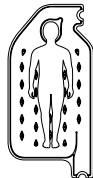
Full Access Underbody
Model 635



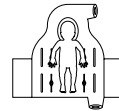
Sterile Full Access Underbody
Model 637



Large Pediatric Underbody
Model 550



Pediatric Underbody
Model 555



¹ Sessler, D.L., Current concepts: mild perioperative hypothermia. *New England Journal of Medicine*. 1997; 336: 1730-1737.

² Barie, P.S., Surgical Site Infections: Epidemiology and Prevention. *Surgical Infections*. Vol 3, Supplement 2002; S-9 – S-21.

³ Jeran, L., American Society of PeriAnesthesia Nurses Development Panel. Clinical Guideline for the Prevention of Unplanned Perioperative Hypothermia. *Journal of PeriAnesthesia Nursing*. Oct. 2001; Vol 16(5): pp 305-314.

⁴ Tryba, M., Leban, J., et al. Does active warming of severely injured trauma patients influence perioperative morbidity? *Anesthesiology*. 1996; 85: A283.

⁵ Tominaga, A., Koitabashi, T., et al. Efficacy of an Underbody Forced-Air Warming Blanket for the Prevention of Intraoperative Hypothermia. *Anesthesiology*. 2007; 107: A91.