



Normothermia Assessment Program

Why patient warming is so important.

Unintended hypothermia is a preventable condition that can have costly, harmful and even deadly consequences. Maintaining normothermia – a core body temperature of 36°C–37.5°C¹ before, during, and after surgery is key in helping to prevent unintended hypothermia.

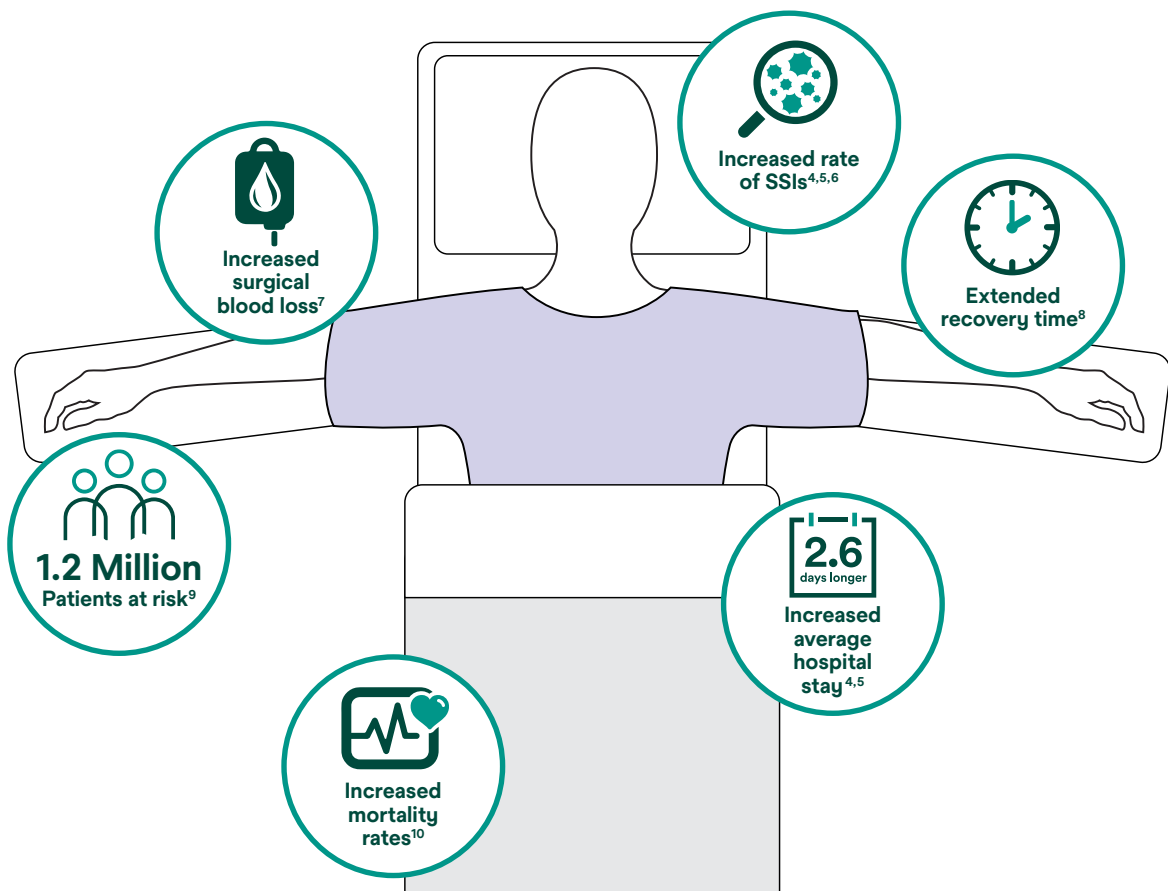


As many as

54%

of surgical patients experienced unintended hypothermia^{2,3}

Potential consequences of unintended hypothermia:



Unintended hypothermia can increase the chance of surgical site infections (SSIs)^{4,5}



SSIs occur in **2-5%** of all patients undergoing inpatient surgery^{11,12}



SSIs increase length of stay by **7-11 days**^{11,12}



SSIs are more than **5X** as likely to result in readmission¹³



Maintaining normothermia can help avoid the potential cascade of negative outcomes associated with unintended hypothermia, including:¹⁴



Adverse cardiac events



Decreased drug metabolism



Shivering and thermal discomfort

Recommended guidance for maintaining normothermia

Organisation	Temperature Monitoring	Prewarming	Intraoperatively
ERAS (2020) ^{15,16}	<ul style="list-style-type: none"> All surgical patients, and especially all infants and children, should have their core temperature monitored continuously during the entire perioperative period. If continuous measurements are not possible, core temperature should be measured at least every ten minutes to ensure patient's core temperature is maintained above 36°C. 	<ul style="list-style-type: none"> Prior to surgery, all adult patients scheduled for neuraxial, general, or combined anesthesia should be prewarmed with a forced-air warming device on its high-temperature setting for at least ten minutes. Longer periods of prewarming can be accomplished by adjusting the warming unit setpoint temperature to the highest setting that does not cause sweating or excessive thermal discomfort. Prewarming should be considered for children who weigh more than 15 kg. The amount of time between the end of prewarming and induction of anesthesia should be as brief as possible, but ideally fewer than 10 minutes. 	<ul style="list-style-type: none"> During surgery, all patients with anticipated anesthesia durations ≥ 30 minutes should receive intraoperative forced-air warming with a blanket that can cover the largest possible amount of skin surface. The warming unit should be operated on the lowest temperature and blower settings that maintain the core temperature within the normothermic range. Infants and children should be warmed unless contraindicated.
ANZCA (2017) ¹⁷	<ul style="list-style-type: none"> Temperature should be measured throughout the operation and in recovery and should be recorded at the same frequency as other vital sign measurements for the first 24 postoperative hours 	<ul style="list-style-type: none"> All "at-risk" patients should have active warming from the first anaesthetic intervention unless febrile Patients undergoing procedures for 30 minutes or more should be actively prewarmed 	<ul style="list-style-type: none"> Active warming should be initiated in the anaesthetic room for all procedures where the total operative time (from first anaesthetic intervention to arrival in recovery) is greater than 30 minutes
ACPAN (2023) ¹⁸	<ul style="list-style-type: none"> Every surgical/procedural patient's temperature should be measured and documented before induction of anaesthesia/sedation and then at least every 30 minutes until the end of surgery/procedure. 	<ul style="list-style-type: none"> Perioperatively, active (forced-air) warming should be commenced as early as possible, preferably in the anaesthetic room or in the pre-operative waiting area, for any patient having surgery with an anaesthetic time of >30 minutes, or who has 2 or more risk factors for inadvertent perioperative hypothermia. 	<ul style="list-style-type: none"> If the temperature is $<36.0^{\circ}\text{C}$, active warming should be initiated unless contraindicated, until the patient is normothermic, $\geq 36.0^{\circ}\text{C}$ with an active warming device which utilises the process of heat transfer to the patient. Forced air warming devices must not be used with the heat applied directly from the hose nozzle placed under the drapes or blankets and without attachment to the compatible forced air warming blanket.
ACORN (2023) ¹⁹	<ul style="list-style-type: none"> Perioperative personnel shall monitor and document temperature at regular intervals for all patients undergoing surgery Every 15 minutes when forced air-warming is used 	<ul style="list-style-type: none"> Warming measures shall be commenced pre-operatively, and all patients at risk of inadvertent perioperative hypothermia shall prewarmed using active warming Commence warming pre-operatively for 30 minutes, if clinically feasible and practically possible, continuing until transfer to the operating room for induction of anaesthesia 	<p>Forced air warming should be used:</p> <ul style="list-style-type: none"> For all patients identified at a higher risk of hypothermia and associated adverse outcomes For all patients with an expected duration of anaesthesia longer than 30 minutes At the maximum temperature setting and adjusted thereafter to maintain normothermia and ensure patient comfort In conjunction with regular temperature monitoring
AORN (2022) ²⁰	<ul style="list-style-type: none"> Measure and monitor the patient's temperature during all phases of care Use the same site and method of temperature measurement throughout the perioperative phases when clinically feasible 	<ul style="list-style-type: none"> When active warming is indicated, prewarm the patient with the selected method Moderate-quality evidence supports prewarming the patient for a minimum of 10 minutes When hypothermia is identified before surgery, initiate interventions to normalise the patient's core body temperature before the patient's transfer to the operating room (OR), if possible 	<ul style="list-style-type: none"> When indicated, warm the patient with one or more of the following active warming methods during all phases of preoperative care Forced air warming (FAW) blanket or gown systems may be used Several clinical practice guidelines recommend use of FAW for procedures longer than 30 minutes
NICE (2016, 2022) ^{21,22}	<ul style="list-style-type: none"> Should be direct measurement of core temperature (may be zero-heat-flux), measured and documented before surgery and every 30 minutes to end of surgery Do not use indirect estimates of core temperature in adults having surgery² 	<ul style="list-style-type: none"> Pre-warm a minimum of 30 minutes Pre-warm for any procedure if patient is at high risk for intraoperative hypothermia 	<ul style="list-style-type: none"> Maintain active warming throughout intraoperative phase Active warming for procedures greater than 30 minutes

Solventum Perioperative Normothermia Protocol

An evidence-based protocol, based on global guidelines: ERAS, WHO, CDC, ACORN (Australia), ANZCA, ACPAN, ACS, AORN, ASA (US), DGAI (Germany), NICE (UK), ORNAC (Canada), SEDAR (Spain), SFAR (France), and SIAARTI (Italy).

Prewarm, Monitor, Maintain.

Pre-op



Prewarm

with forced-air warming for at least 10 minutes on highest setting.²³



Monitor

patient's core body temperature.



Prewarming prior to the induction of anaesthesia helps to maintain normothermia and mitigate the effects of heat redistribution caused by anaesthesia.

Intra-op



Warm

with forced-air warming prior to anaesthesia administration and continue to warm throughout the procedure. The gap from prewarming to IntraOp warming should be less than 10 minutes.²⁴



Monitor

patient's core body temperature continuously during surgery.²²



Maintain

patient's core body temperature near 36.5°C (36.6 + or - 0.5°C).⁴

Every minute in delay of active warming increases odds of hypothermia by 5%.²⁴

Fluid warming should be used if more than 1L of IV fluid will be administered.²⁵

Post-op



Warm

with forced-air warming until patient is thermally comfortable and not shivering.²⁶



Monitor

patient's temperature on admission to recovery room and then every 15 minutes until 36.0°C or above.



Maintain

patient's core body temperature near 36.5°C (36.6 + or - 0.5°C).⁴

By maintaining a patient's core body temperature near 36.5°C (36.6 + or - 0.5°C), patient length of stay has been shown to be reduced by 2.6 days.⁴

Let Solventum help you elevate this protocol with the Solventum Normothermia Assessment Program.

Working together for hypothermia prevention.

As an industry expert in temperature management, Solventum has developed the Solventum Normothermia Assessment Program.

What is the Solventum Normothermia Assessment Program?

The Normothermia Assessment Program aims to help facilities identify areas that need attention in order to decrease the risk of inadvertent perioperative hypothermia. By using the Perioperative Normothermia Protocol as a baseline for assessing adherence to recommendations (see page 4), facilities can capture data along the patient pathway and commit to improving practice where there are gaps.

The program enables participants to have access to project plans, educational resources, simple assessment tools and reporting templates to identify and address areas that need attention. In order to measure temperature throughout the program participants will also trial the non-invasive and highly accurate 3M™ Bair Hugger™ temperature monitoring system which consists of an easy-to-read control unit and a disposable sensor that stays with the patient.

If you are interested in participating in the Solventum Normothermia Assessment Program please register using the QR code below.

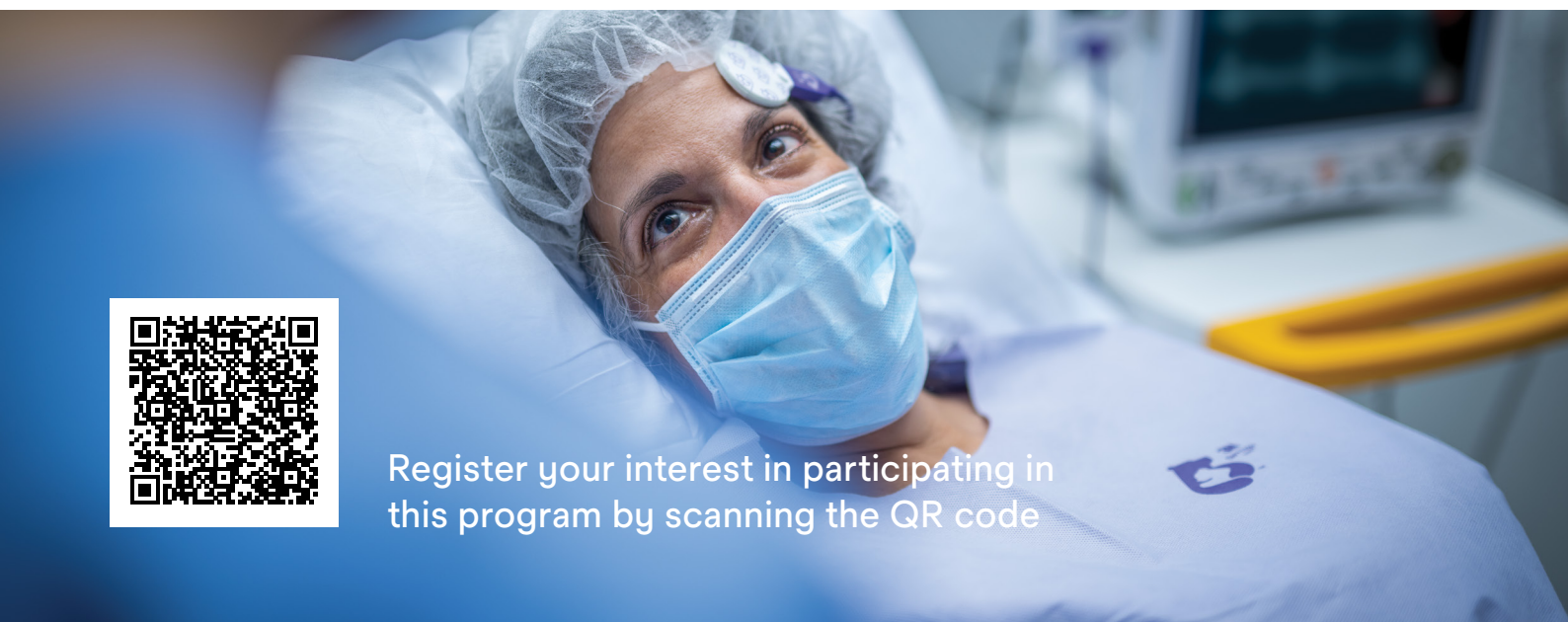
Comprehensive toolkit with project plans templates and tools

Trial use of the 3M™ Bair Hugger™ temperature monitoring unit and disposable sensors

Improved adherence to the evidence-based Solventum Perioperative Normothermia protocols



Register your interest in participating in this program by scanning the QR code





3M™ Bair Hugger™ Warming System

3M solutions to help maintain normothermia through the patient journey



Actively measure patient temperature. Prewarm with 3M™ Bair Hugger™ forced-air warming blanket and gown systems to help prevent hypothermia.

Monitor core temperature during surgery with the 3M™ Bair Hugger™ temperature monitoring system. Proactively achieve and maintain normothermia with 3M™ Bair Hugger™ blanket or gown systems.

Continue to monitor patient temperature. Warm patients using 3M™ Bair Hugger™ blanket and gown systems to aid recovery and improve the patient experience.

Warm



Warming Blankets

3M warming blankets are designed to make your job easier by helping you deliver optimal care while maintaining normothermia. Designed to be used in a variety of procedures, our wide selection of blankets includes: full body, upper body, underbody and paediatric.



Warming Gowns

3M warming gowns help you maintain normothermia while helping to improve workflows, reduce costs and boost efficiencies.



Warming Units

The Solventum technology for warming units has adjustable airflow that provides quick temperature response. Studies show that patients warmed with forced-air have a reduced risk of surgical site infection.^{4,6}

Monitor



Monitor

Knowing your patient's core temperature at a glance can help you respond quickly to prevent and avoid complications. The 3M™ Bair Hugger™ temperature monitoring system offers an accurate, noninvasive, continuous method to easily measure core temperature throughout the perioperative journey.

Maintain



Maintain

Keeping your patient's temperature in optimal range helps prevent the potential for dangerous complications of perioperative hypothermia. The 3M™ Bair Hugger™ normothermia system has a reliable, effective solution to maintain temperature monitoring during every stage of the surgical journey. This innovative system includes a control unit and a disposable sensor that stays with the patient. Together, they provide continuous, noninvasive measuring and reporting of core body temperature. The low-touch sensor allows consistent core temperature monitoring that helps eliminate the variability associated with the use of multiple systems and techniques.

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