Temperature is Vital

Alsius Intravascular Temperature Management

ZOLL

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Intravascular Temperature Management (IVTM)

**Temperature Management Is Vital to Life**

Temperature is one of the four main vital signs. Management of temperature has long been recognized as vital to life. Today, major medical societies recommend temperature management as the standard-of-care treatment for many critically ill or surgical patients.

**ZOLL’s IVTM Is Vital to Temperature Management**

Cooling and warming blankets, ice packs and gel pads, and other external methods are clinically inefficient, labor intensive and hinder access to critically ill patients requiring constant care. ZOLL’s IVTM™ goes beneath the surface to manage core body temperature from the inside out.

Cool or warm saline is circulated through the multiple balloons of the Alsius catheter in a closed-loop design. The patient is cooled or warmed as venous blood passes over each balloon. The process is rapid and precise, offering unlimited patient access and requiring minimal nursing time.

ZOLL’s IVTM offers superior clinical efficiency over external methods in reaching and maintaining target temperature.1, 2, 3, 4

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ASA  American Stroke Association  
AANS  American Association of Neurological Surgeons  
ESI  European Stroke Initiative  
AHA  American Heart Association  
ILCOR  International Liaison Committee of Resuscitation  
ASA  American Society of Anesthesiologists  
ASPAN  American Society of PeriAnesthesia Nurses
Cooling and Warming
From the Inside Out

Add temperature control to your central line using existing insertion sites

- Internal Jugular (IJ)
- Subclavian (S)
- Femoral (F)
The Thermogard XP® Temperature Management System provides the next level of precise and rapid control of your patient’s core temperature. The Thermogard XP provides a platform for maximum cooling and warming applications. Just set the target temperature and rate of temperature change. The Thermogard XP system adjusts the temperature of the saline flowing within the Alsius catheter balloons.

Precise Control

Introducing THERMOGARD XP

Patient and system data are automatically sampled every 60 seconds and a change in patient temperature as small as 0.01°C triggers an immediate adjustment in the saline temperature.

View patient and system data on the display or synchronize with your hospital monitor.

Track patient and system data and electronically transfer to the patient’s file.
ZOLL offers a variety of Alsius catheter options to handle your specific patient challenges including choice of:

- **Catheter Length** - accommodate patient size
- **Insertion Site** - Internal Jugular, Subclavian, Femoral
- **Heat Exchange Power** - number of balloons

Our patented design combines precise temperature management with the critical care functions of a standard central venous catheter. Use this catheter in place of a triple lumen central venous catheter and provide best-in-class temperature management with just one catheterization.
Reducing Fever

Clinical studies have shown that elevated body temperature in neurologic intensive care patients is associated with a longer ICU and hospital length of stay (LOS), higher mortality rate and worse outcomes.5

Incidence of Fever in Neurointensive Care Unit

The Alsius IVTM system was shown to be 64% more effective than surface cooling techniques for fever reduction in neurologic intensive care unit patients.6

Patients cooled with our IVTM system had 2-fold increased odds of survival and had significantly reduced mortality and improved favorable neurological recovery at 30 days compared with the control group.8

Induced Hypothermia

Both the American Heart Association and the European Resuscitation Council advocate cooling unconscious adult patients with spontaneous circulation after out-of-hospital cardiac arrest. Although this applies to patients who have experienced ventricular fibrillation (VF), cooling may also be beneficial for other rhythms or in-hospital cardiac arrest. Clinical studies have shown that induced hypothermia in patients resuscitated after cardiac arrest helps to prevent neurologic damage and improve outcomes.7 Caregivers understand the challenges of implementing a temperature management protocol including:
- lowering patient temperature (32°-34°C)
- maintaining target temperature for 12-24 hours
- controlled rewarming back to normal temperature (37°C)
- preventing rebound fever

ZOLL’s IVTM system provides the controlled cooling and accurate re-warming required for today’s hypothermia protocols.

Therapeutic Warming

Perioperative hypothermia in surgical and trauma patients is associated with increased wound infection, altered drug metabolism, additional bleeding and need for transfusions, adverse cardiac events, and increased length of stay.9

Patient Rewarming During Cardiac Surgery

“The Thermogard™ system is easy to use and provides effective warming during cardiac surgery.”
Gary S. Allen, MD, FACS, Chief of Cardiac Surgery
Memorial Regional Hospital, Hollywood, Florida

ZOLL’s IVTM is Vital to

Therapeutic Cooling
Temperature Management

External Methods Lack Control

- Nurses have a 63% chance of overcooling their patients when using surface cooling methods. This can result in serious complications, including arrhythmias, coagulopathy and increased risk of infection.4
- 14% of patients never reached target temperatures with external cooling methods.7
- 70% of patients required the addition of ice packs.7

A recent study comparing the efficacy of commercially available cooling devices demonstrates the superior power and control of IVTM in reaching target temperature and keeping patients within the target range.1

### IVTM Proven Superior to External Methods

<table>
<thead>
<tr>
<th>Cooling Method</th>
<th>ZOLL IVTM</th>
<th>Medtronic Arctic Sun</th>
<th>Getinge Galileo</th>
<th>Medtronic Celsius</th>
<th>Convective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Rate (°C/hr)</td>
<td>1.46</td>
<td>1.04</td>
<td>1.33</td>
<td>0.18</td>
<td>0.32</td>
</tr>
<tr>
<td>% of Time Patient Was at Target Temperature (°C=37°C)</td>
<td>96.8</td>
<td>55.8</td>
<td>49.5</td>
<td>25.9</td>
<td>30.2</td>
</tr>
</tbody>
</table>

Less Power

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Less Control

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Clinical Applications Where ZOLL’s Intravascular Temperature Management Has Been Used

**Cooling**
- Fever control in Neuro/Surgical ICU
- Therapeutic hypothermia after cardiac arrest
- ICP (intracranial pressure) management
- Therapeutic hypothermia for brain trauma and stroke
- Acute liver failure
- Heat stroke
- Spinal cord injury
- Spinal surgery
- Adjunct with hemicraniectomy
- Status epilepticus

**Warming**
- Trauma victims
- Accidental hypothermia
- Burn surgery and intensive care
- Cardiac surgery
  - OPCAB (off-pump coronary artery bypass)
  - Post-bypass pump (prevention of after-drop)
  - LVAD (left ventricular assist device)
- Thoracic aneurysm surgery
- Maintain viable donor organs for transplantation