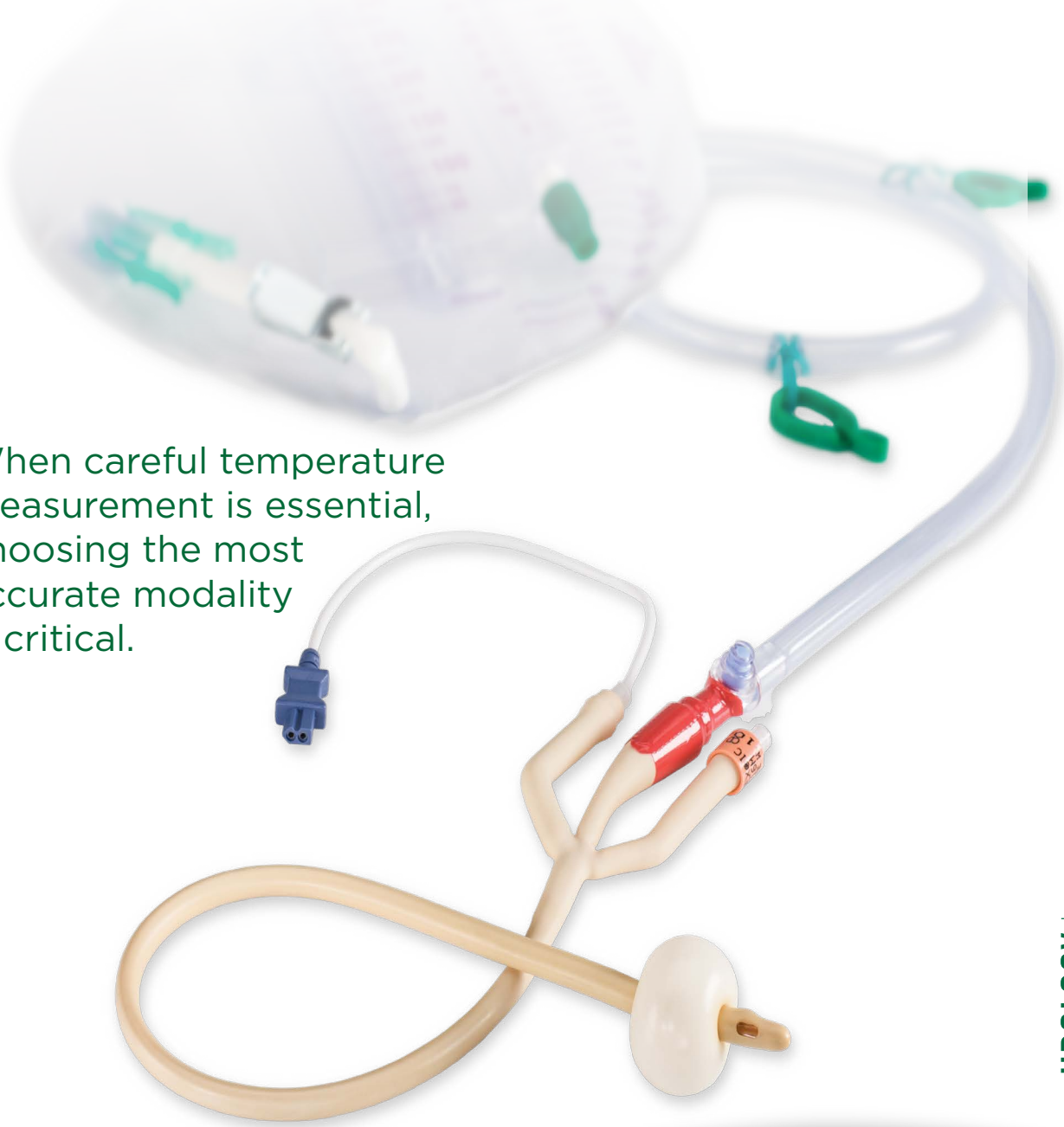
TEMPERATURE SENSING MANAGEMENT SYSTEMS

TEMPERATURE SENSING

FOLEY CATHETERS AND TRAYS



When careful temperature measurement is essential, choosing the most accurate modality is critical.

UROLOGY

BARD | MEDICAL

Support Sepsis Bundles & CAUTI Prevention Guidelines

Surviving Sepsis Campaign[1]

- Temperature is one of the critical parameters used to determine the presence of Systemic Inflammatory Response Syndrome (SIRS). If the patient is experiencing a fever or hypothermia, they are at risk for SIRS and Sepsis.
- Early identification of sepsis and intervention improves outcomes and decrease sepsis-related mortality.
- Reducing the time to diagnosis of severe sepsis is critical in reducing mortality from sepsis-related multiple organ dysfunction.
- Lack of early recognition is a major obstacle to sepsis bundle initiation.

Healthcare Infection Control Practices Advisory (HICPAC) Guideline for prevention of CAUTI 2009[2]

2009 Guideline:

- Requires properly secure indwelling catheters after insertion to prevent movement and urethral traction.
- Requires proper techniques for maintenance and "aseptic insertion of the urinary catheter" and to "maintain a closed drainage system."
- Recommends consider using urinary catheter systems with pre-connected, sealed catheter-tubing junctions

BARD® offers a full line of configured trays with securement and pre-connected systems.

Support Hospital Protocols & Quality Goals

Guidelines of new fever in critically ill adult patients[3]

American College of Critical Care Medicine and Infectious Diseases Society of America (IDSA): 2008 update - Guidelines of new fever in critically ill adult patients

2008 Guideline:

- The guideline identified most authorities found bladder temperature sensing catheters provide essentially identical readings to intravascular sites, are less invasive, provide continuous readings and provide stable measurements regardless of urine flow rate.

NQF-Endorsed Surgical Care Improvement Project (SCIP) Infection Measure 10[4]

Rationale: Core temperatures outside of the normal range pose a risk in all patients undergoing surgery.

Guideline: Surgery patients under anesthesia greater than 60 minutes shall have their temperature monitored with supplemental warming if the patient falls outside the thresholds.

Available in many configurations...

SURESTEP™
FOLEY TRAY SYSTEM

The 400-series temperature sensing Foley catheters are available in latex or latex-free. They are compatible with patient monitors requiring 400-series temperature probes including the BARD® CRITICORE® monitor. These catheters are available with 3.5mm or dual connector and are available in the SURESTEP™ Foley Tray System.

The BARDEX® I.C. anti-infective Foley catheter features a latex substrate while the LUBRI-SIL® anti-microbial Foley catheter features a latex-free silicone substrate. These catheters with temperature sensing thermister, utilize the same technologically advanced formulation consisting of Bacti-Guard®* Silver Alloy coating and BARD® Hydrogel, which reduces bacterial adherence and minimizes biofilm formation.

Accurate

"The most accurate measure of temperature is core temperature taken typically via a bladder catheter or pulmonary artery."

-Adler, et al. 2014[5]

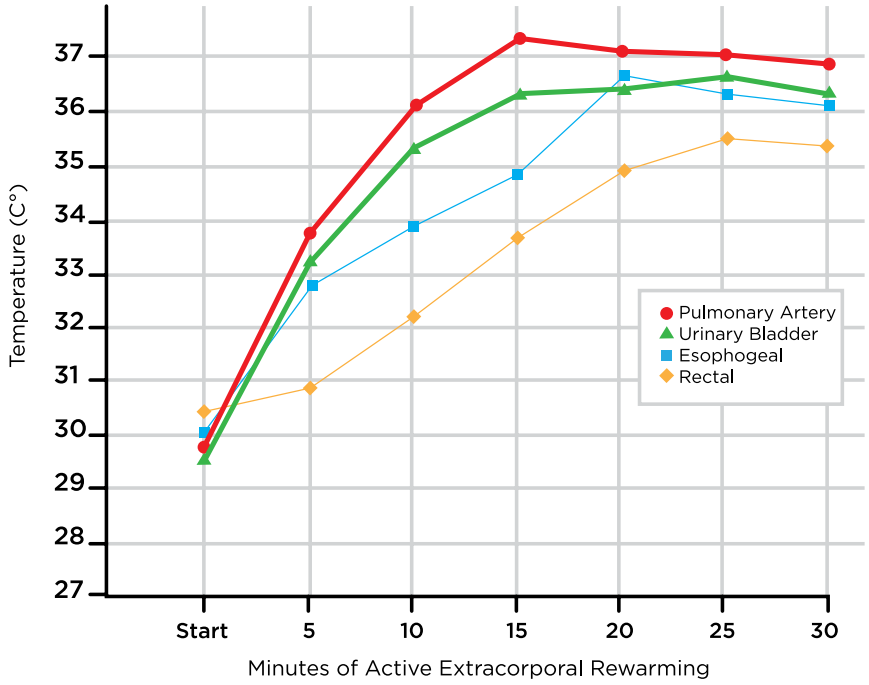
"In most critically ill patients, the urinary bladder technique is preferable because of its accuracy."

- Lefrant, et al. 2003[6]

"Although statistically significant, the mean change in urinary bladder to pulmonary artery temperature gradient between the intervention and control groups was not clinically important, indicating that bladder temperature remains reliable even with significant changes in urine flow rate."

-Fallis et al., 2005[7]

COMPARISON OF CORE TEMPERATURE MEASUREMENTS[9]



According to Lilly *et al.,* 1980 all monitored temperature sites had similar rates of change during external vascular rewarming after cardiopulmonary bypass. Urine temperature very closely tracked blood temperature.[9]

Cost Effective

While the cost of bladder temperature sensing catheters (TSCs) are more expensive than rectal TSCs, the overall cost for bladder TSCs are lower because rectal TSCs must be changed more often than bladder TSCs.

The study found annual savings of more than $5000 for the unit where the study was conducted.

Wollerich et al., 2012[8]

Averaging only **1.5°C less than normal** resulted in adverse outcomes that negatively affected the quality and even length of patients' lives and **added between $2,500 and $7,000** (depending on cost assumptions) per surgical patient to hospitalization costs across a variety of surgical procedures.

Patients in whom normothermia has been maintained during the intraoperative period experience fewer adverse outcomes with a resulting decrease in costs.

Mahoney et al. 1999[10]

Critical Care Patients

In the ICU, when careful temperature monitoring is important (*e.g.,* sepsis surveillance, neurological injury, active heating or cooling of patients)[5,11] temperature measurement is an essential component of patient assessment and management decisions.[11]

CORE TEMPERATURE

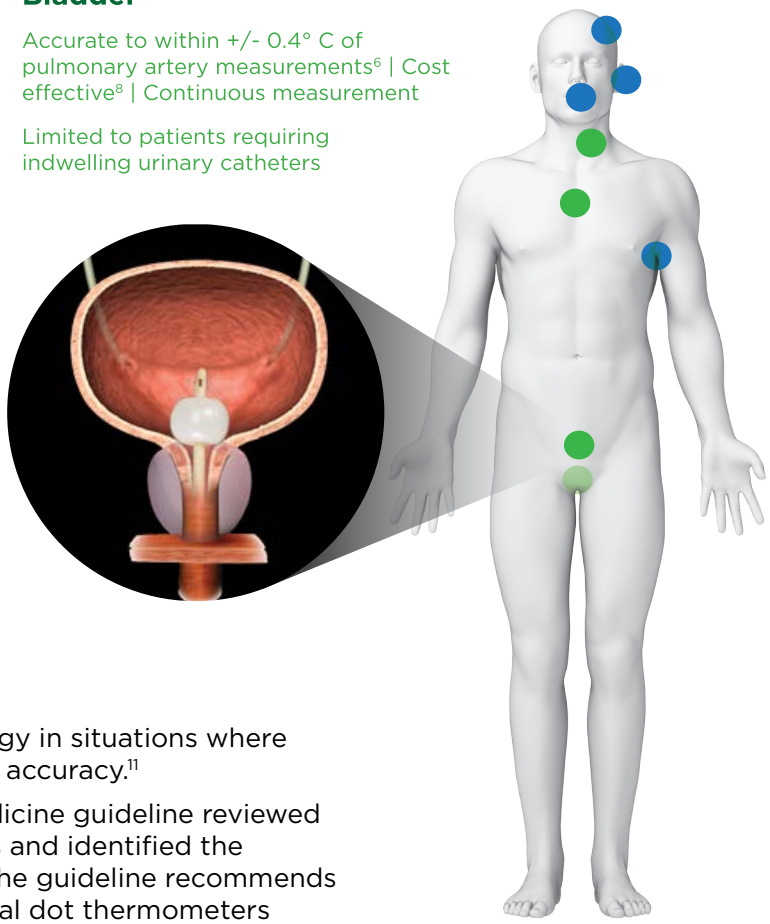
For critical patient temperature monitoring, pulmonary artery temperature has long been the standard by which alternative core temperature modalities are measured against.[3,8]

Bladder thermometers show excellent agreement with pulmonary artery catheters over a wide range of temperatures providing essentially identical readings to pulmonary artery catheters[3,9,11] regardless of urine flow.[7,8,11]

Bladder

Accurate to within +/- 0.4° C of pulmonary artery measurements[6] | Cost effective[8] | Continuous measurement

Limited to patients requiring indwelling urinary catheters



NON-CORE TEMPERATURE

Recent introduction of infrared temporal artery monitoring technology has seen wide adoption in ICUs. A recent publication (Stelfox et al. 2010) found infrared temporal artery temperature technology demonstrated limited agreement for temperatures below 36°C and greater than or equal to 38.3°C. The authors recommended not using the technology in situations where body temperature needs to be measured with accuracy.[11]

A 2008 American College of Critical Care Medicine guideline reviewed available temperature measuring technologies and identified the accuracy by modality (O'Grady et al. 2008). The guideline recommends axillary, temporal artery estimates and chemical dot thermometers should not be used in the ICU.[3]

Urine temperature monitoring is:

Reliable, safe, convenient and provides continuous readings.[3,9]

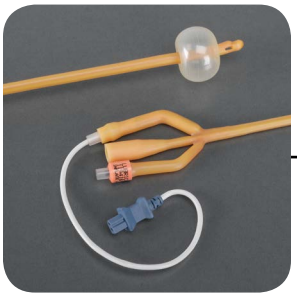
PATIENT MONITOR COMPATIBILITY

Connector Type

3.5mm Connector

Latex and Non-Latex

Dual Connector



Latex and Non-Latex

Adapter Options

Description & Model	Order No.	Packed
3.5mm (1/8") monoplug to 3.5mm (1/8") extension, 12 feet long	153621	1 each

3.5mm (1/8") Monoplug to 1/4" monoplug, 12 feet long	153622	1 each
3.5mm (1/8") Monoplug to 1/4" adapter plug	000834	1 each

3.5mm (1/8") to Two Pin Round Plug, 12 feet long	153625H	1 each

Dual Connector to Two Pin Round Plug, 12 feet long	153624HM	1 each

Dual Connector to 1/4" Monoplug,12 feet long	153623M	1 each

Patient Monitors

Bard® CritiCore® Monitor

GE®/Marquette® Spacelabs® Monitor

Hewlett Packard® or Phillips® Monitor

Foley catheters are intended for use in the drainage and/or collection and/or measurement of urine. Temperature sensing Foley catheters provide a measure of core bladder temperature and are intended for use with compatible 400-series temperature sensing monitors. Please consult product label and insert for any indications, contraindications, hazards, warnings, cautions and directions for use.

*The Foley catheters included in the Bardex® I.C. and Lubri-Sil® I.C.System contain Bacti-Guard® silver alloy coating licensed from Bactiguard AB. Bacti-Guard is a registered trademark of Bactiguard AB.

References:

1. Dellinger, P.R., et al., Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012; Critical Care Medicine; Feb 2013 Vol 41 No 2
2. Gould, C.V., et al., Guideline for prevention of catheter associated urinary tract infections 2009; HICPAC
3. O'Grady, N.P., et. al., Guidelines for evaluation of new fever in critically ill adult patients: 2008 update from the American College of Critical Care Medicine and the Infectious Diseases Society of America, Crit Care Med 2008 Vol. 36, No. 4
4. NQF – Endorsed Voluntary Consensus Standards For Hospital Care; Version 4.3a 2014
5. Adler, A.C., et. al., Sharma R, Higgins T,McGee WT, Hemodynamic Assessment and Monitoring in the Intensive Care Unit: an Overview. Enliven: J Anesthesiol Crit Care Med, 2014 1(4): 010.
6. Lefrant, J.Y., et al., Temperature measurement in intensive care patients: comparison of urinary bladder, oesophageal, rectal, axillary, and inguinal methods versus pulmonary artery core method. Intensive Care Med (2003) 29:414–418
7. Fallis, W.M., et al., The effect of urine flow rate on urinary bladder temperature in critically ill adults., Heart & Lung 2005 Vol 34, No 3 209-216.
8. Wollerich, H., et al., Comparison of temperature measurements in bladder, rectum and pulmonary artery in patients after cardiac surgery, H.; Open Journal of Nursing 2 (2012) 307-310
9. Lilly, J.K., et al., Urinary Bladder Temperature Monitoring: A new index of body core temperature; Critical Care Medicine Vol. 8 No.12 1980
10. Mahoney, C.B., et al.; Maintaining intraoperative normothermia: A meta-analysis of outcomes with costs; AANA Journal; April 1999, Vol 67, No 2
11. Stelfox, H.T., et al. Temporal Artery versus Bladder Thermometry during Adult Medical-Surgical Intensive Care Monitoring: An Observational StudyBMC Anesthesiology 2010, 10:13

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