

# HYPOTHERMIA IN TRAUMA: DELIBERATE OR ACCIDENTAL

## Preface

### Charles E. Smith, MD, FRCPC

*Chair, ITACCS Special Equipment/Techniques Committee  
Professor of Anesthesia  
Case Western Reserve University  
Director, Trauma Anesthesia  
MetroHealth Medical Center  
2500 MetroHealth Drive  
Cleveland OH 44109-1998 USA  
csmith@metrohealth.org*

### Christopher M. Grande, MD, MPH

*Executive Director, ITACCS  
P.O. Box 3279  
Chattanooga TN 37404-0279 USA*

Body temperature is a closely regulated system that allows humans to maintain thermal homeostasis despite large variations in environmental conditions and internal heat generation. Under normal circumstances, thermal homeostasis is accomplished with minimal energy expenditure through a complex combination of behavioral and automatic effector responses mediated by the hypothalamus. After trauma, however, dramatic reductions in body temperature may occur that can result in coagulopathy, acidosis, infection, arrhythmias, myocardial ischemia, and death. These same reductions in body temperature can, on the other hand, result in beneficial effects in patients sustaining traumatic brain injury and shock.

Issues of temperature management are therefore of fundamental importance in the care of every trauma patient, as highlighted in this issue of *TraumaCare*. The articles in this issue are updates of the monograph with same title, published by ITACCS in 1997. That document was based on scientific presentations that took place at TraumaCare '97, the 10th Annual Trauma Anesthesia and Critical Care Symposium and World Exposition.

We were fortunate to attract several distinguished authors to contribute to the original monograph and to update their articles this year. Drs. Grahn and Heller elegantly review the advances in the physiology of temperature homeostasis, including autonomic thermoregulation, and describe a novel, noninvasive approach for delivering a thermal load to the body core utilizing specialized heat exchange-vascular structures. Drs. Brock-Utne and Ramamoorthy review the different sites for estimating the temperature of blood perfusing the hypothalamus, and discuss the various temperature-monitoring technologies available. Dr. Frank provides an in-depth review of the physiologic effects of hypothermia and discuss the implications of research correlating body temperature with clinical outcomes.

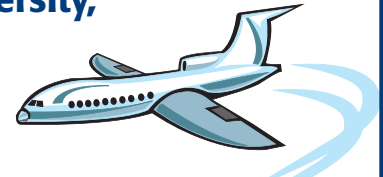
Dr. Smith explores the risk factors for hypothermia in trauma and provides succinct clinical strategies for preventing and treating hypothermia. Drs. Kochanek, Clark, Adelson, Jenkins, Dixon, Bayir, Wu, Shore, and Tisherman delve into the application of therapeutic hypothermia after traumatic brain injury and hemorrhagic shock, and discuss proposed mechanism(s) of action, potential limitations, clinical and

laboratory investigations, and future directions of hypothermia in trauma.

In addition, we dedicate this issue of *TraumaCare* to the memory of Dr. Peter Safar, recognized worldwide for his fundamental and futuristic thinking about the medical uses of hypothermia. We honor his many contributions to the art and science of medicine—his innovations in prehospital care. To this end, we are happy to include a special article written by Drs. Kochanek, Wu, Clark, Dixon, Jenkins, Yaffe, and Tisherman, former colleagues of Dr. Safar, expounding upon his vision.

As editors and principal organizers of the original ITACCS monograph, and as guest editors of this issue of the ITACCS journal, it is our privilege to bring to you this series of articles. We sincerely hope that you find this document to be an informative and useful educational tool.

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Dr. Robin Griffith, *Academic Programme Coordinator*  
+64-21-620-620148, rgriffiths@wnmeds.ac.nz  
Wellington School of Medicine  
University of Otago, PO Box 7343, Wellington, New Zealand



# THE INTERNATIONAL TRAUMA ANESTHESIA & CRITICAL CARE SOCIETY (International Trauma Care)

POB 2797, Pasco, WA. USA 99302  
PH (509) 547-7065, (800) 222-6927  
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