

HYPOTHERMIA PREVENTION, MONITORING, AND MANAGEMENT

Original Release/Approval	2 Oct 2006	Note: This CPG requires an annual review.		
Reviewed:	Oct 2008	Approved:	12 Nov 2008	
Supersedes:	Hypothermia Prevention, Monitoring and Management, updated Apr 2008			

1. Goal. To establish guidance for prevention and management of hypothermia in the combat casualty.

2. Background.

- a. Hypothermia, acidosis, and coagulopathy constitute the “triad of death” in trauma patients. The association of hypothermic coagulopathy with increased mortality has been well described. As many as 66% of trauma patients arrive in emergency departments manifesting some degree of hypothermia (temperature < 96.8°F or 36°C), and over 80% of non-surviving patients have had a body temperature of less than 34°C. This degree of hypothermia causes dysfunction of coagulation proteins, thus exacerbating hemorrhage. The mortality in combat casualties with hypothermia is double that of normothermic casualties with similar injuries.
- b. Prevention of hypothermia should be emphasized in combat operations and casualty management, and all echelons of care. Hypothermia occurs regardless of the ambient temperature; hypothermia can, and does, occur in both hot and cold climates. Because of the difficulty, time, and energy required to actively re-warm casualties, significant attention should be paid to preventing hypothermia from occurring in the first place. Prevention of hypothermia is much easier than treatment of hypothermia; therefore prevention of heat loss should start as soon as possible after the injury. This is optimally accomplished in a layered fashion with rugged, lightweight, durable products that are located as close as possible to the point of injury, and then utilized at all subsequent levels of care, including ground and air evacuation, through all echelons of care.
- c. Measurement of patient temperature and documenting the temperature on standard forms is one measure of compliance with hypothermia prevention and treatment guidelines. While core temperatures are most accurate, obtaining them is not always necessary. Most casualties with relatively minor wounds can have adequate temperature measurement performed using an oral, tympanic, or axillary route. The use of “Temp Dots” on the forehead of casualties, while not as accurate as other measurements, can identify trends in patient body temperature, as well as act as a constant reminder to maintain appropriate hypothermia preventive posture. In any casualty in which these measurements are outside of an expected range (<97°F or >100°F), core temperature should be taken for best accuracy.

3. Evaluation and Treatment. The following measures will be used to prevent hypothermia:

- a. Temp dots will be placed on all immediate/urgent litter casualties (forehead) at Level II and during CASEVAC to Level III.
- b. Keep EMT/OR temp >85-90° F during casualty resuscitation and operative procedures
- c. Use of warmed IV fluids and blanket are indicated, where available, as are forced air warming devices (Bair Hugger) as applicable (see details below.)

Joint Theater Trauma System Clinical Practice Guideline

- d. Mandatory documentation of patient temperature on arrival to, and discharge from, all Level II and III facilities (if non-core temp [axilla, tympanic] is high or low, use core temp [rectal, esophageal] measurement for best accuracy.)
- e. Mandatory use of Hypothermia Prevention/Management Kits (HPMK) for all rotary wing evac/ground evac for Urgent Litter or intubated or Immediate triage category casualties (Level I to II and Level II to III.)
- f. See Addendum A for specific details on the management of hypothermia from the point of injury through the various echelons of care.

4. Responsibilities.

- a. All Health Care Providers, Medics, and Corpsmen will become familiar with the guidelines for prevention, monitoring, and management of hypothermia, as listed and described in Addendum A. Additionally, all personnel involved in the care and evacuation of combat casualties will become familiar with alternative and field expedient hypothermia prevention, and treatment devices and methods, also described in Addendum A.

5. References.

- ¹ DoD Directive 6000.12, "Health Services Operations and Readiness", 29 Apr 96
- ² DoD Instruction 6430.2, "DoD Medical Standardization Board", 17 Mar 97
- ³ HA Policy: 06-005, "Defense-wide Policy on Combat Trauma Casualty Hypothermia Prevention and Treatment", 16 Feb 06
- ⁵ Marine Corps Center for Lessons Learned, "Hypothermia Incidence in Trauma Patients and Prevention/Mitigation Measures: Analysis of data and information from Operation Iraqi Freedom, September 2003 to November 2005," 5 Jan 06

Approved by CENTCOM JTTS Director, JTS Director
and Deputy Director and CENTCOM SG

Joint Theater Trauma System Clinical Practice Guideline

ADDENDUM A

1. General Recommendations. The following outlines general recommendations on how to use specific products at the various levels of care found on the battlefield. A coherent hypothermia prevention and reversal strategy is required during stages of combat casualty care. A layered approach, taking into account weight, power requirements, clinical effectiveness and usability, should be utilized. All devices should be either disposable or PMI and utilized at all levels of care and available on all evacuation platform.

a. At Level I utilize:

- 1) Hypothermia Prevention and Management Kit™ (HPMK) North American Rescue Products Part Number: 80-0027 NSN: 6515-01-532-8056 **or**
- 2) Blizzard Rescue Blanket NSN: 6532-01-524-6932 **and**
- 3) TechTrade 'Ready-Heat' Blanket NSN: 6532-01-525-4063 **and**
- 4) Thermo-Lite Hypothermia Prevention System Cap, manufactured by Encompass Techstyles (item # 5110-100)

b. Tactical Combat Casualty Care principles should be followed while preventing hypothermia:

- 1) Tactical Field Care. In this phase of care of the patient, all attention should be directed towards preventing heat loss. Stop bleeding and resuscitate appropriately. If available, warm fluids should be used. This will start generating internal heat that facilitates rewarming. Place



Figure 1 - Blizzard Blanket

the Thermo-Lite Hypothermia Prevention System Cap on the casualty's head, thereby decreasing heat loss from this exposed site. Place the patient on the Blizzard Rescue Blanket. Remove any wet clothing and replace with dry clothes, if possible. Place the Ready-Heat Blanket on the torso and back of the casualty with a layer of clothing or a sheet between the casualty's skin and the Ready-Heat Blanket: This is a self-heating blanket that requires no special activation. Once the ingredients are exposed to the air, they instantly start to heat up to a maximum temperature of 104°F (40°C) for 8 hours. Wrap the Rescue blanket around the casualty, effectively retaining the heat generated by the warming blanket next to the casualty. If you do not have a survival blanket of any kind, then find dry blankets, poncho liners, space blankets, a sleeping bag, or a

Joint Theater Trauma System Clinical Practice Guideline

body bag, or anything that will retain heat and keep the casualty dry. Place a temp dot on the forehead of the patient. This will assist in monitoring changes in the patients' response to treatment, and will serve as a visual "clue" to remind providers to monitor the patients' temperature throughout the evacuation process

c. At Level IIa utilize:

- 1) Blizzard Rescue Blanket NSN: 6532-01-524-6932 **and**
- 2) TechTrade 'Ready-Heat' Blanket NSN: 6532-01-525-4063 **and**



Figure 2 -Ready-Heat Blanket, Blizzard Rescue Blanket, and Thermo Cap

- 3) Thermo-Lite Hypothermia Prevention System Cap, manufactured by Encompass Techstyles (item # 5110-100)
- 4) Thermal Angel NSN:6515-01-500-3521 **and**
- 5) Bair Hugger NSN: 6530-01-463-6823
- 6) Temp Dots (100/box) NSN 579609404M

d. At Level IIb and III utilize:

- 1) Keep EMT/OR temp >85-90°F; use warmed IV fluids and blankets **and**
- 2) TechTrade 'Ready-Heat' Blanket NSN: 6532-01-525-4063 **and**
- 3) Thermo-Lite Hypothermia Prevention System Cap, manufactured by Encompass Techstyles (item # 5110-100)



Figure 3 – Bair Hugger and Thermal Angel

Guideline Only/Not a Substitute for Clinical Judgment

November 2008

Joint Theater Trauma System Clinical Practice Guideline

- 4) Bair Hugger NSN: 6530-01-463-6823 **and**
 - 5) Thermal Angel NSN:6515-01-500-3521 **or**
 - 6) Belmont FMS 2000 NSN: 6515-01-370-5019
 - 7) Blizzard Rescue Blanket NSN: 6532-01-524-6932
 - 8) Foley Temp Sensing Kit NSN: 603481080516
 - 9) Temp Dots (100/box) NSN 579609404M
- e. On any evacuation platform utilize the:
- 1) Hypothermia Prevention and Management Kit™ (HPMK) North American Rescue Products Part Number: 80-0027 NSN: 6515-01-532-8056 **or**
 - 2) Blizzard Rescue Blanket NSN: 6532-01-524-6932 **and**
 - 3) TechTrade 'Ready-Heat' Blanket NSN: 6532-01-525-4063 **and**
 - 4) Thermo-Lite Hypothermia Prevention System Cap, manufactured by Encompass Techstyles (item # 5110-100)
 - 5) Thermal Angel NSN:6515-01-500-3521
 - 6) Temp Dots (100/box) NSN 579609404M



Figure 4 - Belmont FMS

f. CASEVAC/MEDEVAC considerations:

- 1) During CASEVAC/MEDEVAC, the patient should remain wrapped in the Ready-Heat Blanket, Blizzard Rescue Blanket, and hypothermia cap.
- 2) If these items were not available in the other phases of care, then check with the air crew to see if they have them or any other similar items that can be used to prevent heat loss and can re-warm the patient. This will require pre-mission planning and coordination with air crews.



Figure 5 - Thermal Angel

- 3) Wrap the casualty in dry blankets and try to keep the wind from blowing through open doors and blowing over or under the casualty.
- 4) Utilize the Thermal Angel or other portable fluid warmer on all IV sites.

g. Field Expedient 'Tricks of the Trade' when not all the equipment is available:

- 1) Warm IV fluids using two MRE heaters

Guideline Only/Not a Substitute for Clinical Judgment

November 2008

Joint Theater Trauma System Clinical Practice Guideline

- 2) Transport 'hot pocket' using wool blanket, space blanket and body bag:



**Figure 6 - Warming IV Fluids
w/ MRE Heaters**



**Figure 7 - Hot Pocket (wool blanket, space blanket
and body bag)**

2. Equipment and Supply Information.

The following equipment should be used in a layered fashion across the evacuation chain.

- a. Blizzard Rescue Blanket NSN: 6532-01-524-6932
- b. TechTrade 'Ready-Heat' Blanket NSN: 6532-01-525-4063
- c. Thermo-Lite Hypothermia Prevention System Cap, manufactured by Encompass Techstyles (item # 5110-100)
- d. Space Blanket (Heavy duty)
- e. Wool Blanket (green)
- f. Hypothermia Prevention and Management Kit™ (HPMK) North American Rescue Products Part Number: 80-0027 NSN: 6515-01-532-8056 (comprised of 1-3 above)
- g. Temp Dots (100/box) NSN 579609404M
- h. Thermal Angel NSN:6515-01-500-3521

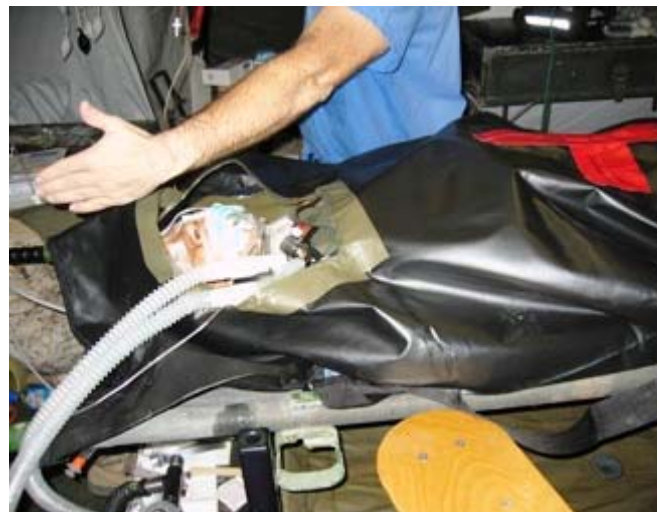


Figure 8 - Hot Pocket (complete)

Guideline Only/Not a Substitute for Clinical Judgment

November 2008

Joint Theater Trauma System Clinical Practice Guideline

- i. Belmont FMS 2000 NSN: 6515-01-370-5019
- j. Bair Hugger NSN: 6530-01-463-6823
- k. Foley Kit, Temp Sensing w/16FR Catheter (10/case) DeRoyal Industries Item # 81-080516 & NSN: 603481080516 (requires Interface Cable, YSI series 400, 12 foot Item # 81-101400 & NSN: 603481101400) <http://www.deroyal.com>



Figure 9 - Ready for Transport in HPMK™



Figure 10 - Vendor Packed "Ready-Heat" Blanket

Items (a-g) do not require power, are used to prevent heat loss and should be used as far forward as possible. Items (h and i) are fluid warmers that require power, and consequently deliver heat to the casualty. They are used during transport and at surgical sites. The Belmont device is easy to use, requires little training and provides warmer fluids at higher rates than other fluid

Guideline Only/Not a Substitute for Clinical Judgment

November 2008

Joint Theater Trauma System Clinical Practice Guideline

warmers. The combination of these devices will both prevent and treat hypothermia. They represent a progression of complexity and power requirements and can be utilized in a layered fashion. Ideally these devices will be utilized during initial treatment and through the evacuation process. These devices should be either disposable or PMI, exchanged upon transport. They should be used on any patient that has suffered hypotension (systolic blood pressure <90 mmHg), is intubated, has received more than 1000cc of fluid, or has received a blood transfusion.