

**"Over the river and through the woods,
Oh how the wind does blow,
It stings the toes,
And bites the nose,
As over the ground we go"**

**- Lydia Child from the childrens' song
"Over the river and through the woods"**



A Guide for the Winter Season Part II

HYPOTHERMIA

By Dean Traiger, M.D., aka **Doc-Dean**

The effects of cold on human performance are perhaps best documented in military history. Many battles were decided from frosty conditions and which side was better prepared. Most cold injuries encountered today affect the wilderness and sports enthusiasts and urban destitute. It happens when your body is not able to make enough heat to replace the warmth you lose to the environment around you.

The most powerful tool in your first aid kit for treating hypothermia is your cell phone. Call for help and evacuate immediately. The first half hour during rescue is the most critical phase of hypothermia management!

Accidental hypothermia is defined as core body temperature that falls below 95° F (35° C). Certain factors may predispose a person to hypothermia such as alcohol ingestion, water immersion, medications or disease. For our purposes we will review only environmental-exposure and exclude the several disease states that can produce hypothermia.

Warm-blooded animals (i.e. - most humans) maintain a precariously dynamic equilibrium between heat production and heat loss. When exposure is obvious, as with avalanche victims the diagnosis is quick, however in the urban setting subtle presentations are more common. Victims often complain of only vague symptoms, such as hunger, nausea, fatigue and dizziness. Other symptoms are slow, slurred speech or incoherence, memory loss or disorientation, drowsiness, repeated stumbling, exhaustion. Uncontrolled shivering can be a symptom also, but not always with older people. Some older people, for reasons not understood, may not be able to shiver or feel cold, which can obviously contribute to the problem.

Three factors are major causal factors in hypothermia: cold, water, and wind.

- **In a cold environment, the body must work harder to regulate heat; contact with cold air, water, snow, ground or clothing will cause heat losses due to conduction.**
- **If a person is submersed in water, heat will be lost due to conduction and convection. At a water temperature of 32 degrees death occurs in 15 minutes; at 70 degrees survival for as long as 48 hours has been observed. Loss of heat by evaporation is a major contributor also. Wet skin or clothing will cool of the body quickly, especially if it is windy and/or cold.**
- **Wind will cause heat loss due to convection, and will accelerate heat loss due to evaporation.**



STAGES OF HYPOTHERMIA:

MILD

98 - 95 degrees - Sensation of chilliness, skin numbness; minor impairment in muscular performance, especially in use of hands; shivering begins.

95 - 93 degrees - More obvious muscle incoordination and weakness; slow stumbling pace; mild confusion and apathy. Skin pale and cold to touch.

93 - 90 degrees - Gross muscular incoordination with frequent stumbling and falling and inability to use hands; mental sluggishness with slow thought and speech; retrograde amnesia.

MODERATE

90 - 85 degrees - Cessation of shivering; severe muscular incoordination with stiffness and inability to walk or stand; incoherence, confusion, irrationality.

SEVERE

85 - 82 degrees - Severe muscular rigidity; patient barely arousable; dilatation of pupils; unapparent heartbeat and pulse. Skin ice cold.

82- 78 degrees and below - Unconsciousness; death due to cessation of heart action.

TREATMENT OF HYPOTHERMIA:

TREATMENT IN THE FIELD

BODY SIGNS/SYMPTOMS TEMP. (rectal)

www.hypothermia.org

37.5°C NORMAL

36 FEEL COLD

Seek dry shelter, replace wet clothing with dry including socks, gloves, hat, cover neck, insulate whole body including HEAD from cold. Exercise but avoid sweating. External warmth (bath, fire) ONLY if CORE TEMP. above 35°C. Warm sweet drinks and food (high calories).

35 SHIVERING 95

BODY CORE TEMPERATURE BELOW 35°C = HYPOTHERMIA = HOSPITAL

34 CLUMSY 94

IRRATIONAL
CONFUSED
(may appear drunk)

33 MUSCLE STIFFNESS 92

NO EXERCISE, HANDLE GENTLY, REST.
NO EXTERNAL WARMTH (except to chest, trunk, eg. Hiebler Jacket).
Warm sweet drinks and calories.
Internal warming via warm moist air (exhaled air, steam) or warm moist oxygen (40 - 42°C at mask).

Monitor pulse, breathing. Restrict all activity, lie down with feet slightly raised.

32 SHIVERING STOPS, COLLAPSE. TRANSFER TO HOSPITAL. URGENT. 90

31 SEMI CONSCIOUS 88

30 UNCONSCIOUS 86

No response to painful stimuli

29 SLOW PULSE AND BREATHING 85

28 CARDIAC ARREST 83

No obvious pulse or breathing
Pupils dilated

Nothing by mouth. Check airway remains open.
May tolerate plastic airway, put in recovery position, check airway, turn every 2 hours to protect skin, monitor pulse and breathing.
Slow mouth-to-mouth breathing, at victim's own rate (may be very slow).
Check airway, CPR, with mouth-to-mouth breathing. Aim for normal CPR rates of 12-15 breaths/min. and 80-100 compressions/min. but slower rates of 6-12 breaths/min. and 40-60 compressions/min. may be adequate. Continue for as long as you can.

BELOW 28°C. NO VITAL SIGNS, COLD. DO NOT GIVE UP TREATMENT.

NOTE: NOT DEAD UNTIL WARM AND DEAD!

Avoid rapid rewarming and HANDLE GENTLY AT ALL TIMES.

Core temperature may lag behind skin temperature and continue to drop, so keep monitoring.



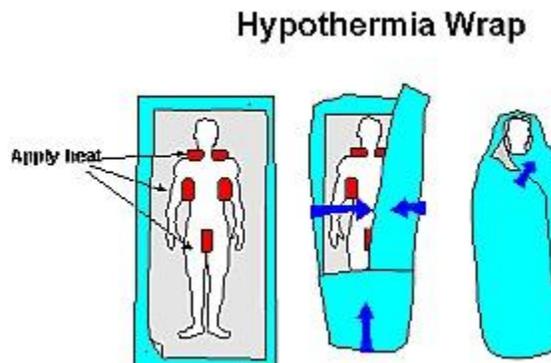
The most powerful tool in your first aid kit for treating hypothermia is your cell phone. Call for help and evacuate immediately.

The first half hour during rescue is the most critical phase of hypothermia management!

Avoid having the victim assist with their own rescue! Muscular activity by the hypothermic victim pumps cold peripheral blood from the arms and legs into the central circulation causing the core temperature to drop even further. Gentle handling is critical! A cold heart is particularly susceptible to ventricular fibrillation, and some victims may suffer a fatal arrhythmia when jolted about during initial handling or transportation.

MODERATE HYPOTHERMIA:

Get the patient as sheltered as possible (tent, snow cave, etc.) Remove wet clothing and replace with dry clothing. Keep patient laying down - but avoid laying on the ground if possible. Place patient in a sleeping bag with a second rescuer of normal body temperature. Direct skin to skin contact is preferable. Warm stones or bottles can also be placed in the bag (Be careful not to burn patient - wrap the hot water bottles and chemical heat packs in socks, or some other form of dry insulation). Make sure all extremities and exposed areas (e.g. face, nose, ears) are protected. If the patient is conscious and able to swallow without danger to his/her airway, give sugar and sweet, warm (not hot) fluids by mouth. DO NOT GIVE ALCOHOL. Build a "hypothermia wrap" by placing dry clothing over all exposed parts of the person except his or her mouth and nose, and wrap a vapor barrier - a tent fly, plastic garbage bags, anything that will minimize the escape of heat - around the person. If evacuation is IMPOSSIBLE and facilities permit, immerse patient in tub of water at 105 degrees Fahrenheit. Monitor patient's temperature rectally with thermometer if possible. Continue rewarming efforts until patient's core temperature is restored to normal. Always evacuate a hypothermic patient as quickly and gently as possible, including re-warmed patients so that they can undergo a more thorough evaluation by a medical professional.



SEVERE HYPOTHERMIA:

Patients in severe hypothermia are often erroneously thought to be dead. Neither pulse, heart sounds, nor respirations may be apparent. Handle a severely hypothermic patient with great care - VERY GENTLE HANDLING. Be innovative in finding ways to avoid moving the hypothermic person while making the hypothermia wrap. (For example, if putting him or her in a tent, cut a hole in the floor of the tent rather than lifting the person into the tent.) Cut away wet clothing and replace with dry clothing. Maintain an airway. Once you start CPR, DON'T GIVE UP. Get help. Do not attempt to re-warm patient unless evacuation is IMPOSSIBLE. Keep patient supine, in a 10 degree head-down tilt. Apply external heat if condition dictates. And give warm, sugary food and drink if patient's condition allows. Get help. If possible, have rescuers bring a heated oxygen unit, and administer to patient. Keep calm and do not become a victim yourself. THE HYPOTHERMIC PATIENT ISN'T DEAD UNTIL HE'S WARM AND DEAD.

People are not the only ones who can get hypothermia; here is an article on hypothermia in

Animals

This article just scratches the surface when it comes to the complex topic of hypothermia, if you would like to learn more, I have an excellent power point slide set, I'd be happy to share. Just email me and request it.