

Abridged from Recommendation M 0014E - obtainable from the IKAR-CISA website, under Alpine Medicine, at <http://www.ikar-cisa.org/>. Professional rescuers, paramedics and physicians are encouraged to review the complete Recommendation.



ICAR

REC M 0014 E

International Commission for Alpine Rescue Commission for Mountain Emergency Medicine

Recommendation REC M 0014 of the Commission for Mountain Emergency Medicine of 1998

The On Site Treatment of Hypothermia

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Intended for First Responders

Preamble

Due to low temperatures, wind and altitude, hypothermia is commonly seen in the mountains. Injured persons are at increased risk. For practical rescue work and instruction of non-medical rescue staff we distinguish between five stages of hypothermia. As criteria we use the degree of consciousness, the presence or absence of shivering, signs of life and core temperature. In mountaineering accidents the core temperature should be taken when possible. Should the core temperature drop abnormally fast, suspect a serious underlying injury.

Clear consciousness with shivering	Mild	HT 1	35 – 32 °C
Impaired consciousness without shivering	Moderate	HT 2	32 – 28 °C
Unconsciousness but some signs of life	Severe	HT 3	28 – 24 °C
No signs of life (apparent death)		HT 4	24 – 10 °C
Death due to irreversible hypothermia	Death	HT 5	<10 °C

1. On Site Triage: who is dead?

Severe hypothermic victims with no cardiac electrical activity (asystole) that may appear dead are frequently resuscitated successfully even after a 3 hours of cardiac arrest. Therefore, prior to establishing death in the field, the mountain rescuer always has to exclude severe hypothermia. A field thermometer will augment the clinical presentation and circumstances. This would best be a thermometer probe inserted into the gullet (oesophagus), as might be carried by a rescue team. However, a snow thermometer inserted carefully into the rectum would be an alternative if this were not available. Additionally, a monitor showing cardiac electrical activity, such as the HeartStart FR2, may be useful and is recommended for rescue professionals. After having excluded lethal injuries, core temperature may be decisive. If the core temperature is above 10 °C and evacuation can be performed in a matter of hours then the victim is potentially salvageable.

ON-SITE TRIAGE:
(Exclude lethal injuries!)

	Severe Hypothermia (HT 4):	Death (HT 5):
Clinical findings:	No vital signs Kneadable chest and abdomen	No vital signs Non-kneadable chest and abdomen
Core temperature:	Above 10 C°	Below 10 C°
ECG:	Ventricular fibrillation or asystole	Asystole

Severe (HT 3 & 4) hypothermia is best treated by cardiopulmonary bypass (CPB) even after prolonged cardiac arrest. This is available in major cities such as Vancouver, Calgary and Edmonton. Serum potassium in a peripheral hospital might be used as a criterion for triage but with caution only.

2. On-site Treatment of Hypothermia

Mild hypothermia (HT1): Shivering with a clear level of consciousness would suggest HT 1. Changing wet for dry clothes, hot drinks and insulation help to prevent a further cooling of the patient. Non-injured victims do not have to be transported to a hospital in all cases.

Moderate hypothermia (HT 2): In case of a victim having an impaired consciousness gentle handling is necessary to avoid life-threatening abnormal cardiac rhythms. Close observation is advisable. We recommend transporting the victim to a hospital with cardiac monitoring capability. Insulate always and re-warm (warming pads in armpits and groins, in sleeping bag with warm companion, etc.) if transport would be prolonged.

Severe hypothermia (HT 3): These victims will generally be unconscious but still show signs of life, such as slow shallow breathing. Gentle handling helps to avoid life-threatening abnormal cardiac rhythms. Close observation is advisable and rescuers are to be prepared to start resuscitation. There is an increased risk for further cooling in HT 3 and therefore insulation against further heat loss is of utmost importance. We recommend transporting the victim to a hospital with cardiopulmonary bypass facilities (CPB) if close. If not, transport to the nearest hospital but offer assistance transporting to CPB in the nearest major city.

Severe hypothermia (HT 4): If no breathing then start rescue breathing. Check carefully for a pulse for a minimum of 45 seconds and if absent and there are no other signs of circulation then initiate compressions at the usual BLS rate and continue until the victim is in the care of a paramedic or other skilled clinician. If an AED recommends a "shock" this may be performed once only as a cold heart may not respond to repeated shocks. Insulate as well as practical given the need for resuscitation. We recommend transporting the victim to a hospital with cardiopulmonary bypass facilities (CPB) if close. If not, transport to the nearest hospital but offer assistance get the victim to CPB in the nearest major city. If skilled assistance is beyond 3 hours, however, then try to re-warm as well as possible and, as chest compressions may trigger a fatal abnormal rhythm and would likely be futile without Advanced Life Support measures, initiate rescue breathing only.

An alternative reference is at - http://www.chems.alaska.gov/ems/downloads_rx.htm. Note that this reference and some others recommend withholding chest compressions in all victims. This point is controversial and the recommendation made in this article is in agreement with the December 2005 BLS Guidelines.

3. Hypothermia Algorithm for First Responders

