

Hypothermia - Guidance for Trainers

Hypothermia training should be kept short and to-the-point. Long, rambling sessions will only dilute the impact of the simple take-home messages.

Level 2

- Causes
 - ▶ immersion, exhaustion or chronic
 - ▶ immersion and exhaustion the most common causes in outdoor environments
- Signs and Symptoms
 - ▶ the “umbles” (mumble, grumble, fumble, stumble, tumble)
 - ▶ briefly explain underlying reasons for each
 - ▶ explain that untreated, the “umbling” hypothermic patient can progress to lowered level of consciousness and death
- Treatment of the “umbling” hypothermic patient
 - ▶ rest, shelter, remove wet clothing and replace with dry
 - ▶ food and hot, sweet drink crucial
 - ▶ exercise again once fully fed and watered
- Prevention
 - ▶ planning: clothing, equipment, route and activity appropriate to weather conditions and fitness of participants
 - ▶ food and drink
 - ▶ rest stops
 - ▶ buddy system

More information should be provided only as required by specialist groups.

Level 4

- Physiology
 - ▶ basic physiology of thermoregulation - how heat is generated and lost
- Causes and prevention
 - ▶ as above
- Signs and Symptoms
 - ▶ as above, plus classifications below
 - ▶ shivering is an unreliable indicator of core body temperature, although it is a good prognostic indicator
 - shivering ceases when hypothermia progresses beyond stage I (see below)
 - shivering relies on having sufficient body fuel reserves to be able to sustain the muscular activity - if the patient is hypoglycaemic and/or dehydrated shivering will cease at a higher core body temperature
 - absence of shivering either due to lack of fuel or low core body temperature indicates a serious clinical condition, and these patients should all be treated as minimum stage II (see below)
 - ▶ in general, thermometers are unreliable and/or impractical in the field (although they may give an indication of trend)
 - ▶ classification using the Swiss System (see below) is on the basis of symptoms - no knowledge of core body temperature is required

- Treatment

- ▶ explanation of the Swiss System of in-the-field classification guiding treatment:

Stage	Signs & Symptoms	Treatment
Stage I	Patient alert and shivering	Provide shelter and insulate from wind, rain or snow. Encourage shivering or exercise to generate heat. Give hot sweet drinks and food. Evacuation from the field is not mandatory, but should be considered if there is the suspicion of a hidden injury or another problem that may have precipitated the hypothermic condition, such as alcohol consumption.
Stage II	Patient drowsy and not shivering	This patient is not shivering, and is vulnerable to life-threatening dysrhythmias (abnormal heart rhythms) if handled roughly or inappropriately. He/she should be nursed horizontally in the safe airway position to protect the airway (unless spinal injury suspected), and he/she should be warmed in the field. If the patient can swallow, then give hot sweet drinks and food. Evacuate ASAP.
Stage III	Patient unconscious, but with vital signs present	This patient will have a reduced level of consciousness, and will be on the cusp of suffering a potentially fatal dysrhythmia (abnormal heart rhythm). Safe (minimal, gentle) patient handling is vital to preserve stability of the circulatory system. The patient should be handled as if they were made of thin glass. Measures to re-warm and insulate against further loss of heat must be employed. Evacuate ASAP.
Stage IV	Absent vital signs, apparent death (thorax compressible, pliable abdominal muscles)	This patient is severely hypothermic and apparently dead. The pupils are fixed and dilated. CPR must be started immediately <i>provided that once commenced, it is continued uninterrupted through to definitive care</i> . The rationale for this is that at very low temperatures it may be difficult to confirm ventilation or cardiac activity and initiation of CPR may trigger ventricular fibrillation (VF). To then cease CPR would be terminal. Handle as for Stage III. Evacuate ASAP.
Stage V	Death due to irreversible hypothermia (non-compressible thorax, rigid abdomen) or injuries obviously incompatible with life.	No treatment.

- Afterdrop

- ▶ The phenomenon of continued core cooling after the patient is removed from the cold environment due to blood returning to the periphery, and other related mechanisms. This may occur during re-warming or on exercise.
 - ▶ This drop in core temperature may be between 2 and 5°C - this may be enough to trigger ventricular fibrillation.
 - ▶ Patients should only be exercised if fully fed and watered, and willing and able to walk unaided. This aims to ensure that the patient's initial core temperature is high enough to withstand a 5°C drop without precipitating VF.

- Re-warming shock
 - ▶ In practical terms, in the outdoors it is impossible to warm a hypothermic patient too quickly:
 - a mildly hypothermic patient has a calorie deficit of 300-500 kcal
 - a severely hypothermic patient's calorie deficit can exceed 2000 kcal
 - warmed oxygen administration can add about 14 kcal/h
 - warmed IV fluids can add about 8-10 kcal/h
 - heat packs can add about 13 kcal/h each
 - patient eating a mars bar adds 280 kcal!
 - ▶ Practical effect of re-warming attempts in the field is likely to be to stop further heat loss.
 - ▶ Whole-body immersion in hot water is contraindicated as a method of re-warming as it will cause massive peripheral vasodilation and circulatory collapse.

- Packaging
 - ▶ Students should be able to effectively wrap a hypothermic patient using a thermal wrap and any other equipment to hand.

Reference

Davis PR and Byers M, 2006. Accidental Hypothermia. J R Army Med Corps 2006; 152: 223-233.