

Cold injury & hypothermia SOP

Further reading

ERC guidelines 2021 - Special circumstances

<https://sjtrem.biomedcentral.com/track/pdf/10.1186/s13049-016-0303-7>

<https://theresusroom.co.uk/hypothermia-2/>



Related SOPs

Drowning SOP

Hypothermia

Hypothermia is defined as **core temperature <35°C**

CVS effects

Sinus bradycardia → +/- AF → VF → Asystole

CNS effects

Reduced conscious level → coma

Reduced metabolic demand

Coagulopathy

The *Swiss staging classification* for different levels of hypothermia is based on clinical findings rather than being reliant core temperature measurement. It has been shown to correlate well with the traditional mild, moderate and severe categories.

Patients with **Stage 1** hypothermia will clinically have a cold trunk, but be fully conscious and shivering. They can be managed with warming blankets, warm drinks and can be encouraged to keep active which will increase their metabolic rate.

Stage 2 hypothermia causes a varying degree of impaired conscious level, and shivering will have ceased. Full ABCDE assessment, cardiac monitoring and supportive care is required. Rewarm with blizzard blanket (but avoid direct heat contact on skin) and apply an insulating layer and an external vapour barrier. **Minimal patient handling is important to reduce the risk of arrhythmias** - this group are unlikely to benefit from invasive airway management.

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Stage 3 hypothermic patients will be unconscious, but will retain some of their vital signs (check for up to 1 minute). In the absence of a central pulse, organised ECG activity generally indicates a low output state rather than true cardiac arrest. The presence of cardiac contractility on ultrasound indicates that chest compressions should be withheld even in the absence of a central pulse. Bradycardia and hypotension that is secondary to hypothermia does not require treatment with drugs. Re-warm as above and transfer to a facility capable of providing extracorporeal re-warming. Airway management in the form of lgel or drug-assisted intubation may be required, but there remains a risk of precipitating arrhythmias with any invasive procedure.

Where organised cardiac activity has been lost, patients are in **stage 4** hypothermia.

Stage 4 hypothermia (VF/Asystole)

Exclude futility using history and clinical findings. The majority of these patients will be asystolic, but may still be salvageable. A thoughtful judgement is required that distinguishes patients who got cold and then recently lost their cardiac output, versus those that died then subsequently got cold. In asystolic patients who have been unseen for prolonged periods (eg. overnight) or those with major traumatic injuries, it may be appropriate to withhold any resuscitation attempts on the basis of futility.

In all other cases:

- Commence BLS and ALS
 - Use mechanical chest compression device where possible
 - CPR can be interrupted for short periods *if essential for extrication*
 - Defibrillation should be attempted up to 3 times, but then withheld
 - Consider withholding ALS drugs as ineffective <30°C. Double interval for 30-35°C
- Prevent further heat loss
- **Early pre-alert** and transport to a centre capable of providing extracorporeal re-warming

RVI, JCUH, Blackpool or Wythenshawe in adults

RVI or Alderhey in children

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Frostbite

Frostnip and **frostbite** are parts of the spectrum of soft tissue injury caused by freezing temperatures. They characteristically affect the distal extremities such as the fingers, toes, nose and ears.



Mild cases of frostnip can be rubbed and actively rewarmed. Prehospital treatment of frostbite is more focused on analgesia, protection of the injured area and passive rewarming only. Active rewarming of established frostbite using a warm water bath should be delayed until the patient reaches hospital.