

# Burns management in ED

Frostbite and hypothermia

# 1. Peripheral cold injuries

<b>a. Frostnip</b>	Mild, reversible, cold injury characterised by pale and numb skin
<b>b. Tissue freezing injury (frostbite)</b>	Below 5 degrees tissue freezes leading to intracellular ice crystals and microvascular occlusions
<b>c. Non-tissue freezing injury</b>	Caused by chronic exposure to high humidity and low temperatures.



# 1.b Frostbite

- First degree frostbite affects the dermis.
- Second degree frostbite lead to clear fluid containing blisters.
- Third degree frostbite lead to haemorrhagic fluid filled blisters.
- Fourth degree frostbite affect deeper structures including muscle, tendons and bone.
- In 90% of cases the distal extremities are affected but the shins, cheeks, nose, ears and corneas can also be affected.
- Frostbite is usually associated with other risk factors such as homelessness, substance misuse, psychiatric illness, previous peripheral vascular disease or trauma.



# 1.b Initial management of frostbite

- Severe frostbite should be discussed with a burns unit.
- Rewarming to the affected areas
  - water between 37-40 degrees
  - contain a antibacterial agent (iodine or chlorhexidine).
  - warmed for **30minutes** or until thawed.
  - Only performed once.
- Adequate analgesia.
- IV fluid resuscitation is not needed unless patient is clinically dehydrated.
- Keep the area elevated.
- Prophylactic antibiotics and tetanus should be given.
- Early mobilisation of affected fingers is recommended.



- **1.b Thrombolysis**

- Thrombolysis can be used to reduce mortality and incidents of distal tissue loss.
- Drugs such as Alteplase can be given in <24hours in severe frostbite.

- **1.b Complications of frostbite**

- Short term

- After rewarming, compartment syndrome is common
- Infection
- Ischemia to the distal extremities with potential necrosis.

- Long term

- Cold sensitivities
- Sensory loss
- Excessive sweating
- Chronic pain
- Loss of function
- Amputation should be considered for sepsis and severe compartment syndrome.



## 2. Hypothermia in a burn patient

- Systemic hypothermia can occur if there are no preventative measures or monitoring of temperature.
- More common in children due to higher area to body mass ratio.
- Only the burn area should be cooled with water and the rest of the body covered and dry.
- If possible, the room where cooling is taking place should be warmed.
- External warming devices should be used.
- Resuscitation fluid should be warmed.
- If a patient goes into cardiorespiratory arrest, the patient has to reach “normothermic” temperatures before resuscitation can be stopped.



## 2. Hypothermia classification and treatment

Severity of hypothermia	Temp range	Signs and symptoms	Treatment
Mild	32-35	Tachycardia Tachypnoea Altered behaviour Slurred speech Shivering Cold diuresis	Prevent further heat loss- remove wet clothes Measure core temperature External heating- warmed blankets, air devices
Moderate	28-32	Hypopnoea Bradycardia Arrhythmias ECG J waves ↓ cardiac output CNS depression Pupillary dilation and loss of light reflex Hyporeflexia No shivering	Warmed air devices Heated IV fluids
Severe	<28	Apnoea Pulmonary oedema Hypotension VF Myocardial depression Coma, fixed pupils Decreased or absent EEG activity	Intubate and ventilate with warmed oxygen DC shock if arrest Amioderone Lavage (gastric, bladder, peritoneal, pleural) Warm water bath immersion