PAEDIATRIC ACUTE CARE GUIDELINE	
Hypothermia	
Scope (Staff):	All Emergency Department Clinicians
Scope (Area):	Emergency Department

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http://kidshealthwa.com/about/disclaimer/

Hypothermia

Hypothermia is core temperature < 35°C. Young children are at risk due to high body surface area to weight ratio.

Background

- Hypothermia usually due to environmental causes e.g. immersion and exposure
- Check core temperature using a rectal or oesophageal thermometer
- Be aware that sepsis may present with hypothermia

General

Effects of hypothermia

32°C	• Decreased pulse / respiratory rate / BP / conscious state • Shivering stops. Muscle rigidity (may mimic rigor mortis) • Atrial arrhythmias appear – usually innocent and revert when rewarmed
28°C	• Ventricular arrythmias (including VF) • Fixed dilated pupils
26°C	• Comatose • Absent reflexes • Apnoea
20°C	• Asystole
15°C	• Temperature of the coldest known survivor

Hypothermia in Resuscitation

- Hypothermia substantially reduces effectiveness of defibrillation and resuscitation drugs. It is reasonable to attempt defibrillation, but if unsuccessful, continue cardiac compression until core temperature is > 30°C, when defibrillation / drugs are more likely to be effective.
- Drugs are generally withheld until core temperature is >30°C, as accumulation may occur while cold, with resultant toxicity when rewarmed.
- Never diagnose death and thus stop resuscitation until the patient is rewarmed to at least 32°C or cannot be rewarmed despite active measures.

Assessment

- Monitor core temperature
- Monitor heart rate and rhythm
- Check electrolytes and glucose

Initial management

Important Principles:

- Actively rewarm to 32°C, then allow passive rewarming. Once above the fibrillation threshold (32°C) there is no urgency in rewarming
- Mild brain hypothermia may limit reperfusion injury
- Avoid hyperthermia (keep temperature < 36.5°C)
- Never diagnose death and thus stop resuscitation until the patient is rewarmed to at least 32°C, or cannot be rewarmed despite active measures
- Beware: rewarming may lead to vasodilation and hypotension (so-called "*after shock*"), which can contribute significantly to mortality
- Beware: Peripheral rewarming and vasodilation can result in cold, acidotic blood being shunted to the core, with a drop in core temperature (so-called "*after drop*") and an increased risk of arrhythmias
- Hypokalaemia is common, even in the presence of marked acidosis
- Check blood gases, potassium, glucose, and haematocrit with every few degrees of warming

Further management

External rewarming (for temperature > 32°C)

- Passive external rewarming:
    - Remove wet clothes, dry patient
    - Warm blankets
    - Cover with sheet of foil/space blankets

- Active external rewarming (truncal areas only):
  - Overhead warmers
  - Warm air system e.g. Bair Hugger
  - Thermal mattresses

Active core rewarming (for temperature < 32°C)

- Warm IV fluids to 39°C with blood warmer (slow) – start with pre-warmed IV 0.9% saline at 40ºC
- Gastric or bladder lavage with 0.9% saline at 40°C
- Peritoneal lavage with potassium-free dialysate or 0.9% saline at 40°C. Use 20 mL/kg cycled every 15 minutes
- Ventilation with humidified gas heated to 42°C
- Pleural or pericardial lavage
- Haemodialysis, extra-corporeal blood warming

Nursing

Routine nursing care.

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