

Heat Related Illness [49, 60, 154–237]

1. Introduction

- Heat related illness is a relatively uncommon presenting condition to ambulance services but it can be life-threatening.
- Heat related illness can be **exogenous**, caused by environmental factors (e.g. the sun) or **endogenous** (e.g. drugs and exercise).
- Heat related illness is a continuum of heat related conditions (Figure 3.1).

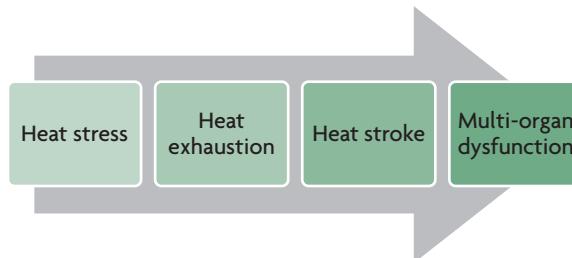


Figure 3.1 – Continuum of heat related illness.

The management of heat related illness is supportive: refer to Table 3.36.

Heat stress

- Heat stress is a mild form of heat illness, characterised by the features below (Table 3.33). This level of heat disorder is often self-managed, but if left untreated can progress to more serious conditions.

Table 3.33 – FEATURES OF HEAT STRESS (EUROPEAN RESUSCITATION COUNCIL GUIDELINES)

Heat stress
Temperature: normal or mildly elevated.
Heat oedema: swelling of feet and ankles.
Heat syncope: vasodilation and dehydration causing hypotension.
Heat cramps: sodium depletion causing cramps.

Heat exhaustion

- A less severe heat illness than heat stroke, lacking the defining neurological symptoms of this condition. Symptoms are mainly due to excess fluid loss and electrolyte imbalance.

Table 3.34 – FEATURES OF HEAT EXHAUSTION (ERC)⁶⁰

Heat exhaustion
Systemic reaction to prolonged heat exposure (hours to days).
Temperature $>37^{\circ}\text{C}$ and $<40^{\circ}\text{C}$.
Headache, dizziness, nausea, vomiting, tachycardia.
Hypotension, sweating, muscle pain, weakness and cramps.

Table 3.34 – FEATURES OF HEAT EXHAUSTION (ILCOR) *continued*

Heat exhaustion

- Haemoconcentration.
- Hyponatraemia or hypernatraemia.
- May progress rapidly to heat stroke.

Heat stroke

- A ‘systemic inflammatory response’ to a core body temperature $>40.6^{\circ}\text{C}$ in addition to a change in mental status and organ dysfunction (European Resuscitation Council Guidelines)⁶⁰.

There are two types of heat stroke:

- Non-exertional heat stroke** due to very high external temperatures and/or high humidity; it tends to be more common in very hot climates. It tends to occur in the:
 - elderly
 - very young
 - chronically ill.
- Exertional heat stroke** is due to excess heat production. This tends to occur in:
 - athletes including marathon and fun-runners
 - manual workers
 - firefighters
 - military recruits.

Table 3.35 – FEATURES OF HEAT STROKE (ERC)⁶⁰

Heat stroke

- Core temperature $\geq 40^{\circ}\text{C}$.
- Hot, dry skin (sweating is present in about 50% of cases of exertional heat stroke).
- Early signs and symptoms, e.g., extreme fatigue, headache, fainting, facial flushing, vomiting and diarrhoea.
- Cardiovascular dysfunction including arrhythmias and hypotension.
- Respiratory dysfunction including ARDS.
- Central nervous system dysfunction including seizures and coma.
- Liver and renal failure.
- Coagulopathy.
- Rhabdomyolysis.

2. Incidence

The exact incidence of heat stroke is unknown with many sufferers self-managing their condition. Mortality, in the absence of a heat wave is relatively low; in the United Kingdom it is estimated to be 40 deaths per million annually.