



## AUSTRALIAN RESUSCITATION COUNCIL

### GUIDELINE 9.3.4

### HEAT INDUCED ILLNESS (HYPERTHERMIA); FIRST AID MANAGEMENT

#### INTRODUCTION

Heat induced illness may be caused by:

- excessive heat absorption from a hot environment.
- excessive heat production from metabolic activity
- failure of the cooling mechanisms
- an alteration in the body's set temperature.

Factors which may contribute to heat induced illness include:

- excessive physical exertion
- hot climatic conditions with high humidity
- inadequate fluid intake
- infection (particularly a viral illness)
- inappropriate environments (eg unventilated hot buildings)
- wearing inappropriate heavy, dark clothing on hot days
- drugs which affect heat regulation.

The very young<sup>1,2,3</sup> and very old<sup>4</sup> are more prone to heat induced illness.

#### RECOGNITION

Mild elevation in body temperature is normally controlled with sweating, which allows cooling by evaporation. Once the individual becomes too dehydrated to sweat, body temperature can rise rapidly and dramatically.

**Heat Exhaustion** is recognised by fatigue associated with headache, nausea, vomiting, malaise and dizziness, which may be accompanied by collapse. Body temperature will be less than 40°C and conscious state will become normal once the victim is lying down<sup>5</sup>,

**Heat Stroke** is the most serious form of heat related illness which may lead to unconsciousness and death. All body organs may be affected. Heat stroke may be recognized by lack of sweating, temperature above 40°C, central nervous system (CNS) involvement, a hot dry skin (however, in some victims profuse sweating is common), collapse<sup>5</sup>.

## **MANAGEMENT**

The management of heat induced illness is aimed at removing the cause and assisting the normal cooling mechanisms of evaporation, conduction, radiation and convection.

### **Heat Exhaustion**

- lie the victim down
- loosen and remove excessive clothing
- moisten the skin with a moist cloth or atomiser spray
- cool by fanning
- give water to drink if fully conscious
- call for an ambulance (Dial Triple Zero - 000)
- keep in the shade.

### **Heat Stroke**

Heat stroke is a life threatening condition <sup>6,7</sup>:

- call for an ambulance (Dial Triple Zero - 000)
- resuscitate following ARC Basic Life Support Flow Chart Guideline 8
- place the victim in a cool environment
- moisten the skin with a moist cloth or atomiser spray and fan repeatedly
- apply wrapped ice packs to neck, groin and armpits.

**Febrile Convulsions** (See ARC Guideline 9.2.4 First Aid Management of a Seizure.)

## **PREVENTION**

On warm humid or hot days:

- keep infants and the elderly in cool, ventilated areas and provide ample oral fluids
- wear light coloured, loose-fitting clothing during physical exertion and hats during outside activities
- take adequate fluids during exertion on hot days.

For participants in sporting events:

- allow six weeks for acclimatisation with progressive exercise before competition
- avoid vigorous exercise during a viral illness
- plan to conduct events in the early morning or late evening or in the cooler months of the year
- provide regular water stations.
- follow the support guidelines relevant to that activity.

At no time should children or the elderly be left unattended in parked cars.

For workers in outdoor or potentially hot environments, refer to occupational health guidelines relevant to the particular environment. Work environments that may be particularly prone to precipitating hyperthermia and heat induced illness include those in which there is a high ambient temperature with reduced air movement, the worker is exposed to radiant heat and there is difficulty in maintaining adequate hydration.

## **LEVEL OF EVIDENCE**

Consensus of Expert Opinion

## **CLASS OF RECOMMENDATION**

Class A: Recommended

## **REFERENCES**

1. Falk B. Effects of thermal stress during rest and exercise in the paediatric population, *Sports Med.* 1998. **25**: 221–240.
2. Harpin V.A., Chellappah G. & Rutter N. Responses of the newborn infant to overheating, *Biol. Neonate* 1983. **44**: 65–75.
3. Mellor M.F.A., Heat-induced illnesses. In: R.M. Barkin, Editor, *Pediatric Emergency Medicine* (2nd ed), St Louis, MO. Mosby. 1997: 496–499.
4. Woodruff R., Hales S., Butler C., McMichael A. (2005) “Climate Change Health Impacts in Australia”, joint report for the Australian Conservation Foundation and the Australian Medical Association, [www.ama.com.au](http://www.ama.com.au).
5. Rogers I. & Williams A. Heat-related illness. In: Cameron P., Jelinek G., Kelly A., Murray L., Heyworth J., editors. *Adult Textbook of Emergency Medicine*. 2nd ed. Sydney: Churchill Livingstone. 2004: 748-751.
6. Bouchama A., Dehbi M., Chaves-Carballo E. Cooling and hemodynamic management in heatstroke: practical recommendations. *Critical Care* 2007, **11**(3):54.
7. Ramsey C.B., Watson W.A., Robinson W.A. Effect of cooling time on survival in classical heatstroke. *Journal of Wilderness Medicine* 1993. **4** (1): 27–31.

## **FURTHER READING**

ARC Guideline 2 Priorities in an Emergency  
ARC Guideline 8 Cardiopulmonary Resuscitation  
ARC Guideline 9.2.4 First Aid Management of a Seizure