

# HEAT STRESS

Heat stress occurs when the body becomes dehydrated and is unable to cool itself enough to maintain a stable, internal temperature. Heat-related illness can range from mild conditions such as a rash or cramps, to very serious conditions such as heat stroke, which can be fatal. Overexertion in hot weather, sun or bushfire exposure, and exercising or working in hot, poorly ventilated or confined areas can increase your risk of heat stress. Heat can also exacerbate an existing medical condition, for example heart disease. Prevention is the best approach in order to avoid heat stress.

## PERSPIRATION AND EVAPORATION

Maintaining fluid balance, or hydration, is an important factor in preserving various body functions and supporting physical performance. During exercise or work in hot and/or humid environments, fluids are lost mainly through perspiration (some water is also lost through respiration). Unless you consume fluid to replace these losses, a fluid deficit will occur. In general, men perspire more than women even when doing the same level of activity, and researchers believe this is primarily because female bodies evaporate sweat on their skin more efficiently; thus cooling down the body without large amounts of perspiration. Weighing yourself before and immediately after physical activity can help you determine your sweat rate.



## HOW TO KEEP YOUR COOL!

The human body is consistently regulated at 37 C. To cool itself, the body perspires and directs blood flow to the surface of the skin, removing heat from the skin as the sweat evaporates.

We can assist the effectiveness of this process however, by:

- Maintaining fluid intake through the day, especially water
- Avoiding exposure to heat sources, including staying out of the sun as much as possible
- Protecting yourself when outside (remember to slip, slop and slap on sunscreen, seek shade and slide on sunglasses)
- Eating light, regular meals to maintain your energy levels
- Limiting physically strenuous activity (particularly outside in hot weather or direct sun)
- Staying cool by using air conditioning, fans and weather appropriate clothing where possible
- Watching out for others, especially older, sick or frail individuals
- Not leaving children or pets inside cars



## RESTORING FLUIDS



Unfortunately, thirst is not an adequate indicator of the body's need for water. We often only feel thirsty once we are already dehydrated, as prior to that our body sends out hunger signals!

Water is the most effective option when it comes to staying hydrated, as it empties from the stomach quickly and is not a diuretic. Fruits and vegetables also have good fluid levels, with consumption promoting hydration. Chilled fluids are fine, however it is advised that water is not ice-cold. This quenches thirst quicker, with less water consumed overall. Hydration-specific drinks containing electrolytes may be useful during heavy exercise or strenuous work in warm temperatures due to their hydration-promoting properties, aiding replenishment of water and electrolytes lost through perspiration.



# WHAT ARE ELECTROLYTES?

Electrolytes are an important part of normal human function, obtained through the foods and fluids we consume. Failure to maintain a normal balance of electrolytes can lead to dehydration, and more concerning, potential heart and neurological problems. Sweat is largely made up of water, as well as important minerals including: sodium, potassium, magnesium, chloride, calcium, bicarbonate, phosphate and sulphate. These minerals are collectively known as electrolytes and are essential in the normal functioning of our cells and organs, including helping to prevent cramps, co-ordinate muscle contractions and improve fluid absorption. Electrolytes can be purchased in: powder form, effervescent tablets, gels, ice blocks and as drinks.

When selecting an electrolyte supplement:

- Try re-hydrating with water first
- Be wary of sugar content
- Avoid caffeinated energy drinks
- Observe the recommended serve size
- Choose reputable products, such as Hydrolyte, Gatorade, Powerade



## EFFECTS OF FLUID LOSS

% BODY WEIGHT LOST THROUGH PERSPIRATION	PHYSIOLOGICAL EFFECT
2 %	Impaired thermo-regulatory ability, dizziness and pale lips
3 %	Reduced muscle endurance and impaired performance
4 - 6 %	Reduced muscle strength and endurance
> 6 %	Severe heat cramp, heat exhaustion, coma and death

## SYMPTOMS & TREATMENT FOR HEAT-RELATED ILLNESS

It is important to know the signs and symptoms of heat exposure and how you should respond, as symptoms vary according to the type of heat-related illness.

### HEAT STRESS

#### SYMPTOMS:

- Tiredness
- Nausea
- Cramps (mainly in calves)
- Feeling hot
- Flushed skin
- Excessive sweating
- Possible fainting / collapsing
- Overall weakness
- Headache
- Tiredness
- Heat fatigue
- Rapid but weak pulse
- Feeling thirsty
- Reduced appetite

#### TREATMENT FOR HEAT STRESS

- Lay down in a cool ventilated area
- Drink plenty of fluids
- If the individual has fainted, elevate legs slightly
- If cramping, provide some electrolytes as well as water

## HEAT EXHAUSTION

#### SYMPTOMS:

- Dizziness
- Profuse sweating
- Headache
- Nausea
- Rapid but weak pulse
- Confusion, disorientation, possible aggression
- In this state, the person could lose consciousness



#### TREATMENT FOR HEAT EXHAUSTION

- Seek immediate medical treatment
- Try to decrease body temperature
- Increase air flow and avoid direct sun
- Replace fluids
- If vomiting occurs, discontinue fluid intake and transport the individual to hospital as they may

## HEAT STROKE

#### SYMPTOMS:

- Severe disorientation
- Confusion
- Possible loss of consciousness
- Person is extremely hot but skin may be dry (not clammy)
- Vomiting
- Convulsions
- Collapse (which could lead to a coma)
- In this state, it is possible for organ damage to occur which can be fatal

#### TREATMENT FOR HEAT EXHAUSTION

- Ring ambulance (triple 000)
- Try to cool the person by thoroughly soaking the person's clothing with cool water or placing them in a tub of cool water
- If conscious, give the person cool water to drink

**Keep water intake up before, during and after exercise, when working in hot or humid conditions or when exposed to sun or bushfire heat. Supplement with electrolytes when undertaking strenuous activity or exposed to heat for long periods.**



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