RISK MANAGEMENT INFONET: RM3
HOT WEATHER GUIDELINES

Last Updated: January 2008

The following information is an extract from Sport Medicine Australia's 'Hot Weather Guidelines' Fact Sheet

To help organisations, coaches, teachers and other individuals when conducting sport in hot weather, SMA has produced this revised set of guidelines. These new guidelines are based on the latest research as well as the expertise of SMA's medical and scientific members.

SMA encourages a common sense approach and consideration of the comfort and well-being of all individuals including participants and officials. Modification or cancellation of events, training or withdrawal from participation may be appropriate even in circumstances falling outside these recommendations. There are many factors to be considered when clubs and associations are contemplating modifying, postponing or cancelling sporting events or training. Sporting organisations need to be aware of the difficulty of setting "one size fits all" guidelines in this area. For normally healthy active people, the only dangers from heat illness are likely to arise from high intensity exercise such as endurance running. Most community sport does not reach this level for periods long enough to cause serious harm.

However, at any time, high intensity exercise in a hot environment, with the associated elevation of body temperature, can lead to heat illness. Heat illness in sport presents as **heat exhaustion** or the more severe **heat stroke**.

Heat exhaustion

- Characterised by a high heart rate, dizziness, headache, loss of endurance/skill/confusion and nausea.
- The skin may still be cool/sweating, but there will be signs of developing vasoconstriction (eg, pale olour).

To avoid heat exhaustion, if people feel unwell during exercise they should immediately cease activity and rest. Further benefit comes if the rest is in a shaded area with some passing breeze (from a fan if necessary) and the person takes extra hydration. Misting or spraying with water can also help.

Heat stroke

- Characteristics are similar to heat exhaustion but with a dry skin, confusion and collapse.
- Heat stroke may arise in an athlete who has not been identified as suffering from heat exhaustion and has persisted in further activity.
- Core temperature measured in the rectum is the only reliable diagnosis of a collapsed athlete to determine heat stroke.

This is a potentially fatal condition and must be treated immediately. It should be assumed that any collapsed athlete is at danger of heat stroke.

The best first aid measures are "Strip/Soak/Fan":

- strip off any excess clothing;
- soak with water;
- fan;
- ice placed in groin and armpits is also helpful.

The aim is to reduce body temperature as quickly as possible. The athlete should immediately be referred for treatment by a medical professional. Important: heat exhaustion/stroke can still occur even in the presence of good hydration.

Dehydration

Dehydration is fluid loss which occurs during exercise, mainly due to perspiration and respiration. It makes an athlete more susceptible to fatigue and muscle cramps. Inadequate fluid replacement before, during and after exercise will lead to excessive dehydration and may lead to heat exhaustion and heat stroke.

To avoid dehydration, SMA recommends that:

- athletes drink approximately 500 mls (2 glasses) in the 2 hours prior to exercise;
- during exercise longer than 60 minutes, 2-3 cups (500-700ml) of cool water or sports drink are sufficient for most sports.
- after exercise replenish your fluid deficit to ensure that you are fully rehydrated, but not over-hydrated.
- refer to SMA's free DRINK UP brochure available as a web download at http://www.smartplay.com.au or from your local National Pharmacies store.

(Remember not only to take players into account but also umpires, officials and volunteers.)

TEMPERATURE

The tables below provide approximate guides to weather conditions and appropriate individual and organisational responses. Although temperature ranges are given, there are not clear demarcations in risk between ranges.

Ambient Temperature

Easily understood, most useful on hot, dry days

Ambient temperature	Relative humidity	Risk of Heat Illness	Possible modifying action for vigorous sustained activity
15 - 20		Low	Heat illness can occur in distance running. Caution over-motivation
21 -25	Exceeds 70%	Low – Moderate	Increase vigilance. Caution over-motivation.
26 - 30	Exceeds 60%	Moderate	Moderate early pre-season training intensity. Reduce intensity and duration of play/training; take more breaks.
31 - 35	Exceeds 50%	High – very high	Uncomfortable for most people. Limit intensity. Limit duration to less than 60 minutes per session.
36 and above	Exceeds 30%	Extreme	Very stressful for most people. Consider postponement to a cooler part of the day or cancellation.

WBGT

Further guidance might be gained from the Wet Bulb Globe Temperature (WBGT) index.
The WBGT is particularly useful for hot, humid days

WBGT	Risk of Heat Illness	Possible modifying action for vigorous sustained activity
Less than 20	Low	Heat illness can occur in distance running. Caution over-motivation.
21 – 25	Moderate to high	Increase vigilance. Caution over-motivation. Moderate early pre-season training intensity and duration. Take more breaks.
26 - 29	High – very high	Limit intensity. Limit duration to less than 60 minutes per session.
30 and above	Extreme	Consider postponement to a cooler part of the day or cancellation

The Bureau of Meteorology (BOM) produces ambient and WBGT readings for many locations in Australia. You can check these readings and a guide for the relative risk for your location at http://www.bom.gov.au/products/IDV65079.shtml or by clicking the "Local Hot Weather alerts" button at www.sma.org.au
N.B. It is important to watch for unusual "heatwave" conditions or variations from the average temperature for the time of year. This is one situation where there may be a greater danger of heat illness.

WHAT STEPS CAN BE TAKEN TO PREVENT PLAYERS GETTING HEAT INJURY?

There are circumstances when players are required to participate in hot conditions. The risk of experiencing heat illness, particularly in such conditions, can be reduced by employing any of a number of strategies.
These include:

1. Timing of Games

Where possible, especially during the summer months, games should not be scheduled during the hottest part of the day (usually between 11am and 3pm, or noon and 4pm daylight saving time). Early morning or night games minimise the risk of encountering unacceptable playing conditions.

2. Hydration

To diminish the risk of heat illness fluids should be consumed before, during and after activity. Thirst should not be relied upon as an indicator of a participant's fluid needs.
Fluid taken should be cooler than the ambient (air) temperature. Research indicates that sports drinks such can be beneficial for replacing fluids, energy and electrolytes lost during exercise. Water is also considered an adequate option to replace fluids, but only for activities lasting up to one hour.

3. Player Rest and Rotation

In conditions of high risk participants should be provided opportunities to rest through the use of player interchange or substitution. Shortening the length of the match or extending the time allowed for ¼, ½ & ¾ breaks may be appropriate. The positive effects of rest breaks should also be maximised by employing the following strategies:

- Allowing players to rest in naturally shaded areas, or providing portable structures that create shade where and when required
- Providing fans, ice packs (for application to groin and armpits) or ice vests
- Providing additional fluids to allow participants to spray or douse themselves

4. Clothing

Light coloured, loose fitting clothes, of natural fibres or composite fabrics, with high wicking (absorption) properties, that provide for adequate ventilation are recommended as the most appropriate clothing in the heat.

OTHER ISSUES

Fitness levels/ Athletic Ability of Participant

- An overweight and unconditioned athlete will generally be susceptible to heat stress.

Age and Gender of Participant

- Female participants may suffer more during exercise in the heat, due to their greater percentage of body fat.
- Young children are especially at risk in the heat. Prior to puberty, the sweating mechanism, essential for effective cooling, is poorly developed. The ratio between weight and surface area in the child is also such that the body absorbs heat rapidly in hot conditions.
- Child athletes must be protected from over exertion in hot climates, especially when required to exercise for 30 minutes or longer.
- Veteran participants (player or umpire) may also cope less well with exercise in the heat. Reduced cardiac function is thought to be responsible for this effect.

Surface Type

- A solid black asphalt court area in direct sunlight will retain heat. Surface type and amount of direct sunlight will vary from facility to facility.

Prior Medical Conditions

- It is important to know if any of the participating athletes have any medical condition or are taking medication that may predispose them to heat illness. Examples include asthma, diabetes, pregnancy, heart conditions and epilepsy. Some medications and conditions may need special allowances.
- Any player that is experiencing a high temperature, viral infection, diarrhoea, or vomiting should be excluded from participating due to the increased risk of heat illness.

Hats and Sunscreen

- Hats and sunscreen should also be used to assist in the prevention of heat illness.
- Sunscreens should be water soluble. Hats should be well vented.

Sports Trainers and First Aid Personnel

It is important to have trained personnel available to manage heat injuries. In situations where heat problems may be expected an experienced medical practitioner should be present. Heat stroke is potentially life threatening. Any indication of this condition should be immediately referred for medical assessment and every effort made to cool the athlete in the meantime.

FOR FURTHER INFORMATION

Sports Medicine Australia: www.sma.org.au
http://www.smartplay.com.au/vic/DocLib/Pub/DocLibDetail.asp?lngDocLibID=87