How do you tell if someone has heat illness?

Heat illness occurs in strenuous sports, but may also occur in activities such as cricket, golf, and lawn bowls with prolonged exposure to hot weather. During sports activities participants should “listen to their bodies”. If they start to experience any of the following symptoms or signs they should stop immediately.

**Symptoms of heat illness may include:**
- light headedness, dizziness
- nausea,
- obvious fatigue
- cessation of sweating
- obvious loss of skill and coordination/clumsiness or unsteadiness
- confusion
- aggressive or irrational behaviour
- altered consciousness
- collapse
- ashen grey pale skin

Heat illness in sport presents as heat exhaustion or heat stroke. Heat exhaustion is the more common sports-related heat illness. Heat stroke is rare, but it is a life threatening condition.

Heat exhaustion. Participants who collapse after exercise, are likely suffering post-exercise drop in blood pressure (postural hypotension), but some may have heat stroke.

Heat stroke. Those who show signs of altered mental function, loss of consciousness or collapse during exercise are likely suffering heat stroke. Sports participants showing signs of confusion. loss of skill. loss of coordination or irrational behaviour should be stopped and removed from the field immediately.
Factors that increase the risk of heat illness include:

- High exercise intensity e.g. Exercising close to personal capacity
- Lack of fitness (due to insufficient training that includes some at competition intensity and duration)
- Previous history of heat illness or heat intolerance
- Age over 65
- High air temperature and high humidity (see tables)
- Low air movement/ no wind, following wind in road running
- Prolonged exposure to hot conditions
- Heavy clothing and protective equipment e.g. padding
- Lack of acclimatisation (due to lack of recent training in warm and humid conditions)
- Dehydration (inadequate water intake before exercise and during activity longer than 60 minutes)
- Illness and medical conditions (current or recent infectious illness, chronic health disorders)

What steps can be taken to minimise the risk of heat illness?

1. Acquiring adequate fitness and acclimatisation

Excellent physical fitness arising from regular endurance training, and acclimatisation to heat from regular training in warm conditions, markedly increase heat tolerance. Acclimatisation for sports activities requires at least 5 days of training in hot or humid conditions, progressing from moderate intensity and duration as acclimatisation develops. In summer, acclimatisation develops naturally as the weather becomes warmer and more humid.

2. Adjusting training and competition intensity to conditions

Exercise intensity in training should be appropriate to current fitness and weather; for example, moderate intensity and duration for pre and early season training of unconditioned players in warm weather. In conditions of increased risk participants should be provided with opportunities to rest through the use of player interchange or substitution. In moderate risk conditions players should be rested for at least 10 minutes per hour. In high-risk conditions players should be rested for at least 15 minutes in an hour.

Some Golden Rules for Training and Competition

- Achieve a high level of physical fitness before exercising strenuously in competition, or in warm weather.
- Exercise at moderate intensity in hot or humid conditions.
- Do not undertake hard exercise, or exercise in hot or humid weather if you feel unwell or are recovering from recent illness.
- Drink water before and during exercise.
- Stop exercise if you feel unwell when exercising hard, or if exercising in hot or humid weather.
- Stop other sports participants if they appear unwell, confused or show loss of skill and coordination.

Children and Heat Stress

Children sweat less and get less evaporative cooling than adults. In warm and hot weather they have greater difficulty getting rid of heat; they look flushed, and feel hotter and more stressed than adults. Overweight children are particularly disadvantaged exercising in warm weather.

Children seem to be effective at “listening to their bodies” and regulating their physical activity. For this reason, children should always be allowed to exercise at their preferred intensity. They should never be urged to exercise harder or compelled to play strenuous sport in warm weather. If children appear distressed or complain of feeling unwell, they should stop exercising.

In warm weather wet sponging will make children feel more comfortable.

Drinks should be provided for children playing sport.
Guidelines to Environmental Conditions and Risk

Remember, sports heat illness can occur with high intensity exercise in cool conditions and with well-hydrated participants. Because sports heat stress is complex, and because individual responses to heat stress vary, it is not possible to provide overall recommendations about limiting conditions to cover all sports. Since heat stress increases with increasing exercise intensity, potential for heat illness may be rated according to the exercise characteristics of the sport. The following sports are rated by decreasing levels of sustained exertion and therefore decreasing potential for risk of heat illness.

1. Endurance running in competition or training (higher intensity/higher risk)
2. Football codes and hockey
3. Tennis
4. Cricket (lower intensity/lower risk)

Individual tolerance to heat stress varies widely. Discomfort is the best personal indication of heat stress. Even in team sports individuals should pace themselves according to their personal feelings of stress. In warm weather if you feel uncomfortably hot reduce exercise intensity. In humid conditions sweat may not evaporate sufficiently for effective cooling; if your skin is dripping wet all over with sweat, reduce exercise intensity.
The following tables provide estimates of risk related to the weather and also guidelines to managing activity in order to minimise heat stress.

**Ambient temperature**
Easily understood, most useful on hot, dry days

<table>
<thead>
<tr>
<th>Ambient Temperature°C</th>
<th>Relative humidity</th>
<th>Risk of Heat Illness</th>
<th>Recommended management for sports activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 20</td>
<td></td>
<td>Low</td>
<td>Heat illness can occur in running Caution over-motivation</td>
</tr>
<tr>
<td>21 - 25</td>
<td>Exceeds 70%</td>
<td>Low - moderate</td>
<td>Increase vigilance Caution over-motivation</td>
</tr>
<tr>
<td>26 - 30</td>
<td>Exceeds 60%</td>
<td>Moderate - high</td>
<td>Moderate early pre-season training Reduce intensity and duration of play/training Take more breaks</td>
</tr>
<tr>
<td>31 - 35</td>
<td>Exceeds 50%</td>
<td>High - very high</td>
<td>Uncomfortable for most people Limit intensity, take more breaks Limit duration to less than 60 minutes</td>
</tr>
<tr>
<td>36 and above</td>
<td>Exceeds 30%</td>
<td>Extreme</td>
<td>Very stressful for most people Postpone to cooler conditions (or cooler part of the day) or cancel</td>
</tr>
</tbody>
</table>

**Heat stress increases with increases in air temperature but be aware that there are not clear demarcations in risk between temperature ranges. At relative humidity levels above those indicated in the table, stress increases markedly.**

Or, further guidance might be gained from the Wet Bulb Globe Temperature (WBGT) index. The WBGT is useful when humidity is high.

**WBGT**
Suitable for hot, humid days

<table>
<thead>
<tr>
<th>WBGT</th>
<th>Risk of Heat Illness</th>
<th>Recommended management for sports activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 20</td>
<td>Low</td>
<td>Heat illness can occur in distance running Caution over-motivation</td>
</tr>
<tr>
<td>21 - 25</td>
<td>Moderate - high</td>
<td>Increase vigilance Caution over-motivation Moderate early pre-season training Take more breaks</td>
</tr>
<tr>
<td>26 - 29</td>
<td>High - very high</td>
<td>Limit intensity, take more breaks Limit duration to less than 60 minutes per session</td>
</tr>
<tr>
<td>30 and above</td>
<td>Extreme</td>
<td>Consider postponement to a cooler part of the day or cancellation (allow swimming)</td>
</tr>
</tbody>
</table>

**Check local weather conditions**
The Bureau of Meteorology provides detailed information about temperature conditions (both ambient and WBGT) wind speed and relative humidity for many regions in Australia (www.bom.gov.au).

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