

PRIMAL Women's Ultimate Club Inc.

Hot Weather Policy



1. Name

- 1.1. The name of this policy is the PRIMAL Women's Ultimate Club Inc. (PWUC) Hot Weather Policy.

2. Date

- 2.1. This policy was enacted on 2 March 2008.

3. Aim & Scope

- 3.1. The aim of this policy is to provide information and guidelines for the reduction of risk of heat-related illness and injuries.

4. Revision

- 4.1. This Policy is to be maintained and reviewed by the Secretary of the PWUC.

5. Background

- 5.1. The risk of heat injury from high intensity sport is significant. It can range from cramps, through heat exhaustion to heat stroke, coma, and death.
- 5.2. During a competition, a competitor may produce 15 - 20 times the heat they produce at rest. Dissipation of this excess heat is primarily achieved through sweating. If the body's ability to dissipate heat is compromised, core temperature in an average size individual may rise by one degree Celsius for every five minutes of exercise if no temperature regulating mechanisms are activated.
- 5.3. If an individual's core temperature is above 40 degrees Celsius (normal 37 degrees) the risk of heat injury is significant.
- 5.4. Factors which impair the body's ability to dissipate heat are:
 - 5.4.1. High ambient temperature
 - 5.4.2. Solar radiation
 - 5.4.3. Humidity (this compromises the efficacy of sweating)
 - 5.4.4. Lack of wind
 - 5.4.5. Dehydration
- 5.5. These factors significantly increase the risk of heat injury occurring.

6. Wet Bulb Globe Temperature

- 6.1. Wet Bulb Globe Temperature (WBGT) is the best measure of heat strain currently available. WBGT is not the same as Ambient or 'Dry' temperature as the WBGT accounts for the levels of humidity, radiation, wind movement and ambient temperature.
- 6.2. Generally speaking, on a dry, windy, overcast day WBGT will be well below ambient temperature, whereas on a humid, still, sunny day WBGT will be above ambient temperature.
- 6.3. Ideally, WBGT should be measured on site immediately prior to the start of an activity or event using a specific WBGT thermometer. This is done to ensure measurements are reflective of the conditions at which the event is to be played.
- 6.4. If a WBGT thermometer is not available, the following formula can be used to estimate WBGT:
$$\text{WBGT} = 0.567 \times \text{Ta} + 0.393 \times e + 3.94$$
where:
 - Ta = Dry bulb temperature (°C)
 - e = Water vapour pressure (hPa) [humidity]The vapour pressure can be calculated from the temperature and relative humidity using the equation:

$$e = rh / 100 \times 6.105 \times \exp (17.27 \times Ta / (237.7 + Ta))$$

where:

rh = Relative Humidity [%]

This formula assumes full sunshine and light winds and so is conservative.

- 6.5. For the general population, the following strategies should be adopted:
 - 6.5.1. At WBGT greater than 28 degrees Celsius there is extreme risk of heat injury to all participants. Activities requiring moderate to intense exercise should be postponed or cancelled.
 - 6.5.2. At WBGT between 23 and 28 degrees Celsius there is a high risk of heat injury. Activities requiring moderate to intense exercise should be modified to allow best heat management strategies to be implemented.
 - 6.5.3. At WBGT between 18 and 22 degrees Celsius there is a moderate risk of heat injury.
 - 6.5.4. At WBGT below 18 degrees Celsius there is a minimal risk of heat injury.
- 6.6. Since it is extremely difficult at the moment for event organisers to get measurements of WBGT, it is recommended that organisers adopt the hot weather management strategies outlined in this policy, taking into account the following factors when decided whether to cancel or postpone activities:
 - 6.6.1. ambient temperature
 - 6.6.2. solar radiation (cloud cover, elevation of sun)
 - 6.6.3. wind
 - 6.6.4. humidity
 - 6.6.5. fitness of participants
 - 6.6.6. intensity of activity

7. Heat Illnesses

- 7.1. Dehydration
 - 7.1.1. Fluid loss 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.
- 7.2. Heat Exhaustion
 - 7.2.1. Dehydration can lead to heat exhaustion:
 - 7.2.2. Characterised by a high heart rate, dizziness, headache, loss of endurance/skill/confusion and nausea.
 - 7.2.3. The skin may still be cool/sweating, but there will be signs of developing vasoconstriction, eg pale colour.
 - 7.2.4. Athletes will pass little urine, which will be highly concentrated.
 - 7.2.5. Cramps may be associated with dehydration.
 - 7.2.6. The rectal temperature may be up to 40°C and the athlete may collapse on stopping activity.
- 7.3. Heat Stroke
 - 7.3.1. Severe dehydration may lead to heat stroke.
 - 7.3.2. Characterised similar to heat exhaustion, but with a dry skin, confusion and collapse.
 - 7.3.3. Heat stroke may arise in an athlete who has not been identified as suffering from heat exhaustion and has persisted in further activity.
 - 7.3.4. This is a potentially fatal condition and must be treated immediately by a medical professional.
 - 7.3.5. Heat exhaustion/stroke can still occur even in the presence of good hydration.
- 7.4. Hyponeutremia

- 7.4.1. In addition to fluids, replacing electrolytes is critical in training sessions longer than one hour. The primary electrolytes include sodium (generally bound to chloride), potassium, magnesium (best absorbed when bound to gluconate) and calcium. These electrolytes are involved in metabolic activities and are essential to the normal function of all cells, including muscle.
- 7.4.2. An electrolyte imbalance includes symptoms similar to dehydration: nausea, vomiting, muscle weakness, muscle cramping, muscle twitching, overall fatigue, laboured breathing, the sensation of "pins and needles" and confusion.
- 7.4.3. Failing to replace electrolytes during exercise longer than an hour can be life threatening. Hyponatremia ("water intoxication"), when blood sodium levels drop dangerously low, can trigger seizures, coma and even death.
- 7.5. First aid
 - 7.5.1. Remove from playing field.
 - 7.5.2. Lay down in cool, shady place.
 - 7.5.3. Administer electrolytic drinks.
 - 7.5.4. Cool body by putting in cold shower, under hose, applying ice packs to armpits & groin.
 - 7.5.5. If losing consciousness or not responding immediately to first aid treatment, call an ambulance or seek professional medical advice.

8. Susceptibility

- 8.1. Age
 - 8.1.1. Athletes under 13 or over 40 are at increased risk.
- 8.2. Gender
 - 8.2.1. Women are generally more at risk than men due to average high percentage of body fat.
- 8.3. Fitness
 - 8.3.1. Unfit or unconditioned athletes are at increased risk.
- 8.4. Overweight
 - 8.4.1. Athletes who are overweight are at increased risk.
- 8.5. Predisposed Medical Conditions
 - 8.5.1. Various medical conditions may significantly increase the risk of heat illness, including:
 - 8.5.1.1. Conditions: asthma, diabetes, pregnancy, heart conditions, epilepsy
 - 8.5.1.2. Acute illness: fever, flu, gastro, nausea, vomiting.
 - 8.5.1.3. Drugs: alcohol, social drugs, some medications.
- 8.6. Acclimatisation
 - 8.6.1. Athletes who are coming from colder climates are at an increased risk of heat illness.

9. Hydration

- 9.1. The more an athlete sweats, the more fluid he must consume to avoid dehydration. High levels of dehydration may increase the risk of heat stress. To diminish the risk of heat stress fluid should be consumed before, during and after activity.
- 9.2. It is recommended participants drink at least 7-8ml of fluid per kg of body mass no more than 2 hours before exercising to promote adequate hydration and allow time for excretion of excess water.
- 9.3. During exercise it is recommended that participants should drink fluid at regular intervals to replace water lost through sweating. Participants should aim to drink at least 3ml per kg of body mass (about 250ml for the average athlete of around 70 kilograms) every 15 to 20 minutes.

However this may vary dependent on the rate of sweating. Fluid taken should be cooler than the ambient temperature.

- 9.4. Water is considered an adequate fluid option for activities lasting up to one hour although there is evidence that sports drinks do provide a benefit for exercise that is less than one hour in duration.
- 9.5. Participants in events or activities exceeding one hour should use sports drinks as a means of replacing fluids, carbohydrates and electrolytes lost during prolonged activity.
- 9.6. Post-event re-hydration can take 24 hours or more.
- 9.7. In high risk conditions:
 - 9.7.1. Players should be encouraged to drink fluids at scheduled drinks breaks.
 - 9.7.2. Players should be provided convenient access to fluids during activity without unnecessary interruption to the game or event.
 - 9.7.3. Event organisers should include additional drinks breaks for players in conditions of high risk.
- 9.8. The PWUC recommends the average athlete drinks:
 - 9.8.1. at least 500mls, 45minutes prior to exercise
 - 9.8.2. at least 200mls every 15 minutes during exercise (1 litre over a 90 minute game)
 - 9.8.3. 1.5 times fluid deficit after exercise to ensure full re-hydration.

10. Venue considerations

- 10.1. If adequate shade is not available adjacent to the playing fields, shade can be provided by tents or umbrellas. Players can bring their own shade if forewarned by the event organiser.
- 10.2. Access to water should be made clear to all athletes. Preferably water is made available on the sideline.
- 10.3. On the beach
 - 10.3.1. Sand is a much hotter environment for play than grass.
 - 10.3.2. Water is often not readily available on the sand.

11. Player rest

- 11.1. In moderate risk conditions, players should rest at least 10% of the playing time.
- 11.2. In high risk conditions, players should rest at least 25% of the playing time.
- 11.3. Roster sizes and breaks in competition should be set to allow these minimum rest times.

12. Cooling

- 12.1. The following strategies can be used to assist cooling of players:
 - 12.1.1. Spending time off the field in shade.
 - 12.1.2. Electric fans on the sideline.
 - 12.1.3. Retreating to air-conditioned areas during breaks.
 - 12.1.4. Water spray bottles.
 - 12.1.5. Wetting the hair.
 - 12.1.6. Cold showers between games.
 - 12.1.7. Cool water immersion or the wearing of ice vests.
- 12.2. Pre-cooling before events has been demonstrated to increase athletic performance in endurance sports. This practice could be of benefit to many athletes. However, it must be noted that the effects of a pre-cooling manoeuvre are reduced rapidly by a warm up. Therefore, any pre-cooling strategy must be undertaken in concert with a vastly reduced warm-up if it is to be effective.

13. Uniforms

- 13.1. Light coloured, loose fitting clothes, made 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.
- 13.2. This clothing should further complement the existing practices in Australia that protects the skin against permanent damage from the sun.

14. Children

- 14.1. The physiological and structural difference between children and adults places children at a greater risk of suffering from heat illness. These differences impact on a child's ability to respond to environmental heat and acclimatise to heat. These differences include:
 - 14.1.1. A larger surface area/body mass ratio, which affects their ability to dissipate heat when environmental temperature is greater than skin temperature. This can be an advantage when heat loss is necessary, but is a disadvantage when radiant or convective heat gain occurs.
 - 14.1.2. Immature sweating mechanisms which require a greater increase in body temperature before the onset of sweating.
 - 14.1.3. Fewer and smaller sweat glands which limits the production of sweat.
- 14.2. At ambient temperature greater than or equal to 34 degrees Celsius there is extreme risk of heat injury to all children and adolescents participants. Events should be postponed or cancelled.
- 14.3. The following strategies for sport involving children should be considered in addition to strategies for reducing the risk of heat illness for the general population.
- 14.4. Venues
 - 14.4.1. Organisers of activities that are conducted under hot conditions must provide sufficient shade, and regular drinking opportunities. This is particularly critical where the fitness and state of acclimatisation of the young participants are uncertain.
- 14.5. Hydration
 - 14.5.1. Children may consume more fluid when the drinks offered are perceived as palatable to them. Therefore, for children and adolescents having trouble drinking adequate tap water, flavoured drinks such as commercially available sports drinks may need to be considered.
 - 14.5.2. Conversely, the high energy content of some flavoured drinks may be unnecessary during exercise in athletes who have a genuine rather than an aesthetic need to lower body fat levels.
 - 14.5.3. It is recommended that young athletes begin regular and effective drinking routines before, during and after activity so that the practice becomes habitual.
 - 14.5.4. Individuals could monitor weight changes before and after activity to estimate the amount of fluid that they are likely to require.
- 14.6. Overweight Children
 - 14.6.1. Coaches of overweight children and adolescents should take extra precautions to lessen the potential for heat gain.
 - 14.6.2. Whenever activity in hot conditions is unavoidable with these children, coaches should decrease the volume and duration of physical activity, and increase opportunities for drinking, rest, and shade as a matter of priority.
- 14.7. Acclimatisation
 - 14.7.1. At the onset of hot weather, the young athlete may take longer to acclimatise.
 - 14.7.2. It is recommended that training volumes (duration and intensity) decrease during the first few weeks of hot weather, along with increased times for rest, using access to shade more frequently, and increasing the number of mandatory drinking breaks.

14.8. Clothing

- 14.8.1. Select uniforms that minimise heat gain.
- 14.8.2. Coaches, teachers, and parents should encourage children and adolescents to wear appropriate clothing in layers that can be easily removed during activity.

15. Event organisers checklist

- 15.1. The following precautions are recommended when any of the following conditions is true:
 - 15.1.1. The event is to be held between December and February during daylight hours.
 - 15.1.2. The weather forecast is for temperatures above 30 degrees C or humidity is above 50%.
 - 15.1.3. Children or athletes of unknown fitness or acclimatisation are participating.
 - 15.2. Have a thermometer at the fields to measure ambient temperature during the competition.
 - 15.3. Alert Captains to the conditions and to changes in the events, and encourage teams to pace their games accordingly.
 - 15.4. Adopt a minimum roster size to provide sufficient rest periods.
 - 15.5. Schedule longer or more frequent breaks in play.
 - 15.6. Schedule sufficient re-hydration time between games.
 - 15.7. Schedule a major break (at least 1 hour, eg lunch) during the hottest part of the day (11am-3pm).
 - 15.8. Provide shade adjacent to all fields, or alert teams if they should bring their own shade.
 - 15.9. Provide sunscreen lotion for all athletes and volunteers.
 - 15.10. Have water available within 100m of all playing venues, or provide teams with the means to collect and transport sufficient water for each game.
 - 15.11. Provide sports drinks for purchase by the athletes.
 - 15.12. Have extra water available for athletes to spray or douse themselves.
 - 15.13. Have trained first aid personnel available to treat any injuries.
 - 15.14. Report any incidents of heat illness to the PWUC.
16. The following resources/websites provide useful information on hot weather and sport:
1. Bureau of Meteorology information on WBGT:
http://www.bom.gov.au/weather/sa/inside/heat_stress/
 2. Sports Medicine Australia (SMA) - Preventing Heat Illness in Sport Policy:
http://www.sma.org.au/information/preventing_heat_illness_in_sport_policy.asp
 3. Sports Medicine Australia – South Australian (SMASA), Hot Weather Guidelines: www.smasa.asn.au