

Citation:

Japan Amateur Sports Association (Japan)

<http://www.japan-sports.or.jp>

Part II

Preventing Heat Stroke While Playing Sport

Heat stroke – ignorance and overdoing it

1. Knowing and preventing heat stroke

Heat stroke is a generic term for any illness that occurs in hot environments. When playing sports the main problem areas are thermal fatigue and heat exhaustion. Here are a few of the types of illnesses.

- i) Heat syncope: With the expansion of the cutaneous blood vessels, blood pressure drops causing diminished cerebral blood flow. As a result dizziness and fainting may occur, along with paleness and a faint quick pulse.
- ii) Thermal fatigue: Symptoms that occur due to dehydration include lassitude, fatigue, dizziness, headaches, nausea, etc.
- iii) Heat cramps: If you sweat profusely and drink only water, the salt level in your blood stream drops and you may suffer cramps in your legs, arms, and abdominal muscles.
- iv) Heat stroke: Due to the rise in body temperature, abnormalities may occur in the central nervous system and cause impaired consciousness (slow to react, unusual behaviour, loss of consciousness, etc.). If this happens, the chances of fatality are high.

8 DO NOT LOSE YOUR HEAD – Quick First Aid Measures

Be aware of first aid measures for when you might need them.

Heat syncope (i); thermal fatigue (ii): Take the affected person to a cool area, loosen their clothing and lay them down. Upon drinking water they should recover. Put their legs in an elevated position. Massaging their ankles (from the periphery then towards the centre) is also effective. If they are unable to drink water due to feeling nauseous or vomiting, it will be necessary to take them to a hospital and get an intravenous drip.

Heat cramps (iii): They should recover upon drinking normal saline solution (0.9%).

Heat stroke (iv): This is a possibly life-threatening emergency. Cool them down and take them immediately to the intensive care ward of a hospital. The prognosis will depend on how quickly the affected person's body temperature drops and regains consciousness. Therefore, immediate first aid treatment is important.

In order to reduce the temperature, souse the affected person with water, dab them with a moist towel and fan them. Dabbing the neck, armpit and base of the legs, where there are thick veins, with ice or icepacks is also effective. If the person has bad circulation, elevate their legs and massage them.

Their level of consciousness and body temperature are important factors for ascertaining symptoms. The affected person may have impaired consciousness. If they are slow to respond or behave in an unusual way, it is best to assume that their condition may be critical and begin first aid treatment.

Principles of Preventing Heat Stroke

WBGT: 31~°C/Wet bulb temperature 27°C~/Dry bulb temperature 35°C~: Stop exercising.

When your WBGT becomes higher than 31°C, the body temperature becomes higher than the skin temperature. Apart from special circumstances, stop exercising.

WBGT: 28~31°C/Wet bulb temperature 24°C~27/Dry bulb temperature 31°C~35: Be on high alert (stop all strenuous exercise).

When your WBGT becomes higher than 28°C, there is a high risk of heat stroke occurring. Avoid strenuous exercise, or marathon type exercises that raise your thermal temperature. When exercising take plenty of breaks and drink fluids. If you are low on strength or not used to the heat, stop all exercising.

WBGT: 25~28°C~/Wet bulb temperature 21°C~24°C/Dry bulb temperature 28°C~31°C: Be on alert (take plenty of breaks).

When your WBGT becomes higher than 21°C, the risk of heat stroke increases, thus you should take regular breaks, and drink fluids. Watch out for signs of heat stroke in addition to regularly drinking water while exercising.

WBGT: 21~25°C~/Wet bulb temperature 18°C~21°C/Dry bulb temperature 24°C~28°C: Mostly okay (drink fluids as needed).

When your WBGT is less than 21°C, normally there is very little risk of heat stroke however, you still need to drink fluids as needed. There is a chance that heat stroke may occur at local marathons and other such events, therefore caution is still advised.

WBGT (Wet Bulb Globe Temperature is commonly used as a guidance for environmental heat stress to prevent heat stroke during physical exercise or while at work)

Outdoors: $WBGT=0.7 \times \text{wet bulb temperature} + 0.2 \times \text{globe temperature} + 0.1 \times \text{dry bulb temperature}$

Indoors: $WBGT=0.7 \times \text{wet bulb temperature} + 0.3 \times \text{globe temperature}$

- The WBGT is preferable for the environmental condition grade.
- The wet bulb temperature may be undervalued when the temperature is high. Refer to the dry bulb temperature as well when using the wet bulb temperature.
- Pay attention to the temperature when using the dry bulb temperature. As the temperature increases you will need to be careful that the environmental condition does not fall into a more severe category.