



## HEAT STROKE - Risk and Consequences

Heatstroke is a condition caused by your body overheating, usually as a result of prolonged exposure to or physical exertion in high temperatures. This most serious form of heat injury, heatstroke, can occur if your body temperature rises to 104 F (40 C) or higher. The condition is most common in the summer, extreme heat season or travel to a hotter climate.

In Malaysia, the weather in the Klang Valley was recorded among the hottest, according to the Malaysian Meteorological Department (MetMalaysia). People are advised to be careful when doing outdoor activities, not to open burning, reduced wear dark clothes and to drink enough water due to the hot weather expected to end this March. Met Office also relates this phenomenon with climate change. People are advised to be alert to the initial sign of heat stroke due to the uncertain heat and dry weather in the country. The high temperature also creates complications to the brain's nervous system which can cause a coma in turn leading to death.

Working in hot conditions without drinking enough fluids is the main cause of heat stroke. You can get heat stroke by not replacing lost fluids over days or weeks, or you can bring it on in a few hours by exercising strenuously on a hot day without drinking plenty of liquids first.

Liquids help to cool us down by allowing the body to produce sweat. However, liquids are also necessary for bodily functions, such as keeping up blood pressure. You can lose large amounts of body fluid in the form of sweat without noticing any effects, but at a certain point the body will reserve the remaining fluid for vital functions and stop sweating. The body's core temperature then shoots up, and cells start dying.

Sweat evaporates more rapidly in dry weather, cooling the body more efficiently than in humid weather. When working in humid conditions, the core temperature rises more rapidly. This is why weather forecasts add a humidity factor or heat index to represent how you will actually feel outdoors.



Heat stroke generally presents with a hyperthermia of greater than 40.6 °C (105.1 °F) in combination with disorientation and a lack of sweating. Before a heat stroke occurs, people show signs of heat exhaustion such as dizziness, mental confusion, headaches, and weakness; if a heat stroke occurs when the person is asleep, symptoms may be harder to notice. However, in exertional heat stroke, the affected person may sweat excessively. Young children, in particular, may have seizures. Eventually, unconsciousness, organ failure, and death will result.

The symptoms of heat stroke are quite different from those of heat exhaustion. A person suffering from heat exhaustion will usually be sweating profusely in an attempt to get rid of excess heat, but will have normal behaviour and cognition. Remember, heat exhaustion if not treated, can lead to heat stroke. Heat stroke is diagnosed by looking at signs and symptoms, such as body temperature, and finding out about the person's recent activities.

## Symptoms

Heatstroke signs and symptoms include:

- **High body temperature**  
A core body temperature of 104 F (40 C) or higher, obtained with a rectal thermometer, is the main sign of heatstroke.
- **Altered mental state or behavior (hallucinations)**  
Confusion, agitation, slurred speech, irritability, delirium, seizures and coma can all result from heatstroke.
- **Alteration in sweating**  
In heatstroke brought on by hot weather, your skin will feel hot and dry to the touch. However, in heatstroke brought on by strenuous exercise, your skin may feel dry or slightly moist.
- **Nausea, headache and vomiting**  
You may feel sick to your stomach or vomit and your head may throb.
- **Flushed skin**  
Your skin may turn red as your body temperature increases.
- **Rapid breathing**  
Your breathing may become rapid and shallow.
- **Rapid heartbeat**  
Your pulse may significantly increase because heat stress places a tremendous burden on your heart to help cool your body.

SEVERITY	TYPES	DEFINITION
Minor	Heat Enema	Is a self-limited process manifested by mild swelling of the feet, ankles, and hands that appears within the first few days of exposure to a hot or extreme environment
	Prickly Heat	Is a pruritic, maculopapular, erythematous rash over normally clothed areas of the body
	Heat Cramps	Painful, involuntary and spasmodic contractions of skeletal muscles
	Heat Syncope	Is a variant of postural hypotension (low blood pressure) resulting from the cumulative effect of relative body water depletion, peripheral vasodilatation, and decreased vasomotor tone that lead to syncope
	Heat Exhaustion	Is occur because of body water and/or sodium depletion that tends to occur in the elderly and in persons working in hot environments with inadequate water replacement which subsequently lead to lethargy and dizziness
Major	Heat Stroke	Is a life-threatening illness characterized by an elevated core body temperature that rises above 40° C and central nervous system dysfunction that results in delirium, and convulsion or coma

**Severity of Heat Related Illness from Mild Illness to Major Illness.**

**Main risk factors**

Anyone can develop heatstroke, but several factors increase your risk:

- **Age.**  
 Your ability to cope with extreme heat depends on the strength of your central nervous system. In the very young, the central nervous system is not fully developed, and in adults over 65, the central nervous system begins to deteriorate, which makes your body less able to cope with changes in body temperature. Both age groups usually have difficulty remaining hydrated, which also increases risk.
- **Sudden exposure to hot weather.**  
 You may be more susceptible to heat-related illness if you're exposed to a sudden increase in temperature especially for prolonged periods while working, sports, outdoor activities or by intense physical activity during an extreme summer heat wave, extreme heat season or travel to a hotter climate. Limit activity for at least several days to allow yourself to acclimate to the change or limit your exposure to direct heat. However, you may still have an increased risk of heatstroke until you've experienced several weeks of higher temperatures.

## Treatment and Prevention

- If you suspect someone has heat stroke, begin treating them immediately while someone else calls an emergency contact number (999).**  
Everything must be done to cool the heat stroke victim immediately. The most effective way is to remove them from the sun and immerse the body in cold water, such as a river, stream, or bathtub. You can also fan vigorously while misting with tepid water to help cool them down until help arrives. You can also remove most of their clothes, and apply ice water towels or packs to the groin, neck, armpits, and head.
- If the person starts shivering, slow down the cooling treatment, because shivering raises core temperature.**  
Take the person's temperature every 10 minutes if you have a thermometer handy. You should aim for a core temperature of about 39°C (102°F), as too low can result in a slide towards dangerously low temperatures (*hypothermia*). All the while you should be making arrangements to get the victim to an emergency room. Watch for signs of respiratory arrest and be ready to give mouth-to-mouth resuscitation (rescue breathing) if needed.
- The heat exhaustion victim should also be put in a cool place.**  
Lay them down and give small gulps of liquid every few minutes. "Sports" drinks are best but water is often more readily available. Sponge the victim with cool water and remove unnecessary clothing. You should watch carefully for signs of deterioration, but there's no need to rush to a hospital for a normal case of heat exhaustion.
- The way to prevent these problems is to drink very large amounts of liquid during heat waves, especially if you're planning on working or exercising outdoors.**  
If you are exercising, you should consume approximately 500 mL to 1.8 L of water in the 3 hours before the activity and about 200 mL to 250 mL every 20 minutes during the activity. Fluid loss continues after the activity is over, so it is important to continue to consume water for several hours after exercise.



**EXTREME HEAT**  
CAUSES MORE DEATHS  
each year than hurricanes, lightning,  
tornadoes, earthquakes, and floods  
**COMBINED!**

**WHO'S AT RISK?**  
Adults over 65, children under 4, people with existing medical  
problems such as heart disease, and people without access  
to air conditioning

**WHAT CAN YOU DO?**

**STAY COOL**

- Find an air-conditioned shelter
- Avoid direct sunlight
- Wear lightweight, light-colored clothing
- Take cool showers or baths
- Do not rely on a fan as your primary cooling device

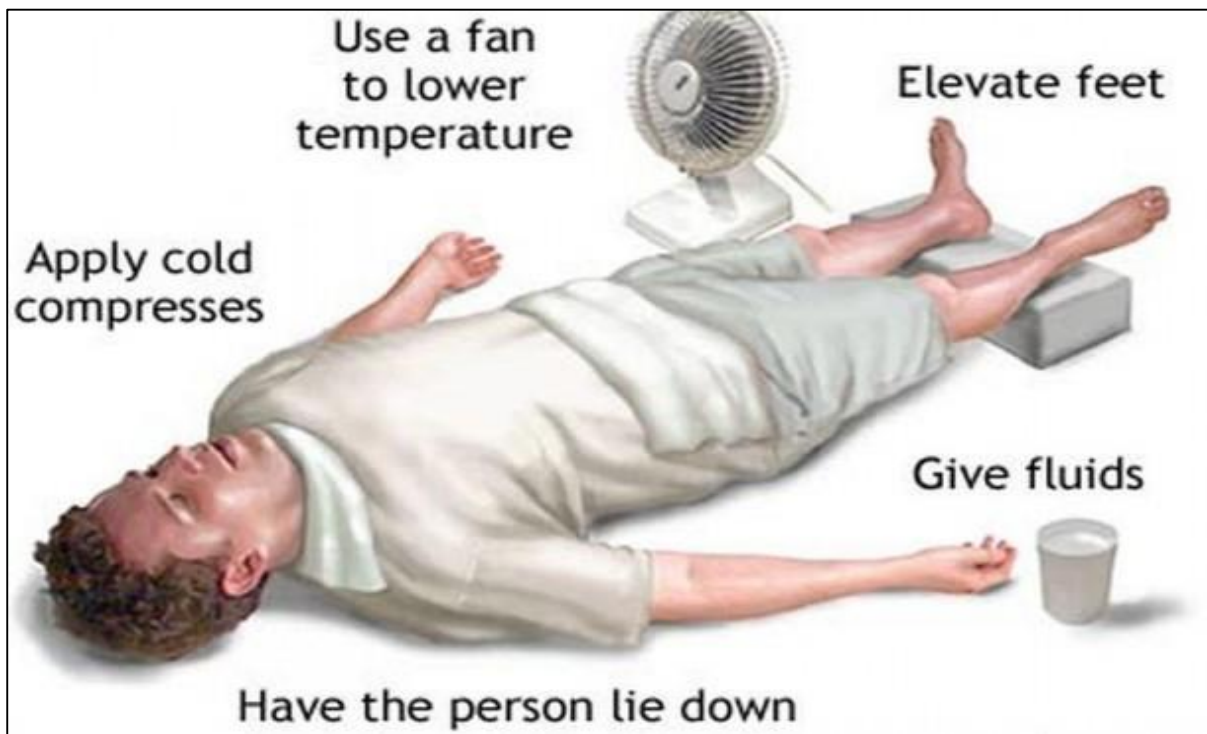
**STAY HYDRATED**

- Drink more water than usual
- Don't wait until you're thirsty to drink more fluids
- Avoid alcohol or liquids containing high amounts of sugar
- Remind others to drink enough water

**STAY INFORMED**

- Check local news for extreme heat alerts and safety tips
- Learn the symptoms of heat illness

[www.vdh.virginia.gov/Weather/ExtremeHeat.htm](http://www.vdh.virginia.gov/Weather/ExtremeHeat.htm)  
[www.cdc.gov/ephracking](http://www.cdc.gov/ephracking)



You shouldn't take salt tablets unless you're also drinking a lot of water. When in very hot environments, drink every hour whether you feel like it or not, since thirst is a late indicator of dehydration. To prevent heat stroke:

- Avoid heavy outdoor activities during the hottest times of the day (10 am to 3 pm).
- Stay out of the sun if possible.
- If you need to be in a hot environment, take 10 to 20 minutes of breaks per hour of activity in the shade or an air-conditioned space.
- Wear loose-fitting, light-colored clothes – light colors reflect more sunlight – and a wide-brimmed hat.
- Try to relax in the shade during the hottest part of the day.
- Avoid coffee and alcohol, especially beer, due to their fluid loss effect.

### **Heat stroke is a medical emergency.**

Learn to recognize the symptoms listed above and take the appropriate action. The heat stroke victim needs to go to the emergency room as soon as possible, but the first step is to get the core temperature under control. Monitor body temperature with a thermometer and continue cooling efforts until the body temperature drops to 101 to 102 F (38.3 to 38.8 C). Always notify emergency services (999) immediately. If their arrival is delayed, they can give you further instructions for treatment of the victim.

