



SAFE WORK PRACTICES:

HEAT STRESS

What are the dangers of heat stress?

As your body heat rises, your blood vessels get bigger and put an increased strain on the heart and circulatory system. In addition, a greater volume of blood is dedicated toward cooling (see below), which causes less blood flow to the brain and can result in dizziness or momentary blackout. If your core temperature gets high enough ($\approx 108^{\circ}\text{F}$), it can cause permanent damage to the central nervous system and can lead to death.

How does the body cool itself?

The primary way your body cools itself is by pumping hot blood from the core organs to the skin, which allows heat to dissipate to the environment. Sweating aids this process by evaporating and cooling the skin and blood near the skin surface. This cooling process can be hindered by the following:

- Hot or humid conditions, which decrease evaporation at the skin surface;
- Loss of fluids and minerals from excessive sweating, which reduces the volume of blood available to transfer heat from the core;
- Loss of fluids, which reduces sweating and the cooling effect of evaporation;
- Digestion of large meals, which increases the core temperature and leaves less blood available to transfer heat from the core; and
- Increased work activity, which generates heat at the core.

What can be done to avoid heat stress?

1) Acclimatization. Gradually get your body adapted to higher temperatures by working increasingly longer periods each day with rest or light work in between. Your body may need a week or more to fully adapt to higher temperatures and will begin to lose its resistance after a week without exposure. Physical fitness speeds the acclimatization process.

2) Work Procedures. Rotate duties between indoor and outdoor or light and heavy work in order to give your body a chance to recover from heat exposure.

3) Food and Water Intake. Don't eat a big lunch if you are going to be working in a hot environment all afternoon. Drink 5-7 ounces of cool water ($50\text{-}60^{\circ}\text{F}$) each 15-20 minutes when working in a hot environments. If you wait until you get thirsty, your body is already in a one-liter deficit. Do not take salt supplements unless you are being treated for a heat disorder.

Effects of Heat Stress

Heat Rash

Symptoms: A red itchy rash (a.k.a. prickly heat).

Cause: Hot and humid environments, which result in sweat ducts getting plugged and the skin remaining moist for prolonged periods.

Treatment & Prevention: Can be treated with skin ointment and prevented by regular bathing and by keeping the skin clean and dry.

Heat Cramps

Symptoms: Painful cramps of the muscles used while working (e.g., arms, legs, stomach). Sudden onset accompanied by hot, moist skin, a normal pulse, and a normal to high temperature.

Cause: Excessive sweating and replacement of water but not salt.

Treatment & Prevention: Drink lightly salted fluids, move to a cool/shaded area, and loosen clothing. Seek medical assistance if cramps do not go away.

Heat Exhaustion

Symptoms: Heavy sweating with cool, moist, and pale skin. Pulse is weak and rapid, and blood pressure may be low. Intense thirst, weakness, and loss of coordination. Additional symptoms may include: tingling in the hands and feet, headache, nausea, vomiting, loss of appetite, rapid breathing, and fainting.

Cause: Loss of fluids and minerals, which cause enlarged blood vessels to collapse.

Treatment & Prevention: Seek medical assistance immediately. Cool the victim as fast as possible (e.g., move to a cool/shaded area, loosen/remove clothing, fan, douse with cool water). Elevate the victim's legs, and massage the limbs. Have the victim drink salted fluids.

Heat Stroke

Symptoms: High body temperature with an absence of sweating. Hot, flushed, and dry skin. Rapid pulse with labored breathing, high blood pressure, and general weakness. Headache or dizziness with confusion, bizarre behavior, nausea, and vomiting. The victim's condition may deteriorate rapidly and can lead to seizure/convulsions, loss of consciousness, and death.

Cause: Failure of the body's cooling system leading to a rapid and uncontrolled rise in body core temperature.

Treatment & Prevention: Seek emergency medical assistance immediately. Treatment is the same as for heat exhaustion (above) except more urgent since the victim is in far worse condition. Heat stroke is often not recognized or is mistaken for a heart attack or head injury.

FOR FURTHER GUIDANCE CONTACT THE RISK SERVICES OFFICE AT X4797