

Before you begin

Review the reference section's resources at the end of this section. Become familiar with ways to prevent heat stress for your employees. Ask group members to list how they deal with heat-stress related symptoms at home and on the job.



Introduction

High temperature and humidity extremes can be dangerous to people at work and can lead to injuries, illnesses, and even death. There is statistical evidence that accidents increase during periods of temperature extremes.

Heat stress can affect your physical and mental conditions. These conditions diminish your motor coordination and mental capacity, as well as cause fatigue, resulting in more accidents. You can stop thinking rationally, make poor decisions, panic, and fail to take advantage of life saving actions.

These conditions may impair your ability to work safely when operating equipment, working at elevation, around road traffic, and handling hazardous substances.

Heat stress or hyperthermia symptoms can range from minor illnesses to fatalities if the victim does not seek or get relief quickly.

The information in this discussion is vital for your safety at work, but it is also relevant for you and your family away from work.

Definitions

Heat Cramps—Severe, sometimes disabling, cramps that may begin suddenly in the hands, calves, or feet; characterized by hard, tense muscles. This condition is generally caused by dehydration and associated loss of electrolytes. It is often common for symptoms to occur after working hours. Heat Cramps will generally resolve on their own with rest, gentle stretching and rehydration. They can be treated with frequent fluid intake — water and/or carbohydrate-electrolyte drinks.

Heat exhaustion — This is a dangerous condition for people who do not receive help quickly. Primary causes are dehydration and not being acclimatized. The person usually feels weak, has an elevated body temperature, and therefore, appears flushed. You should take the person to a cooler, shaded environment and give them fluids right away.

Heat stroke — This is by far the most dangerous heat-related ailment. It happens when the body's cooling defense mechanisms become overwhelmed resulting in a continually rising core body temperature, permanent brain damage, and even death. **Heat stroke is a medical emergency; immediately seek medical help.** You should make every effort to immediately lower the person's temperature with whatever means are at hand. Remember to never give liquids orally to an unconscious person because this could cause serious injury and/or death.

Acclimatization— This refers to the beneficial physiological adaptations that occur during repeated exposure to a hot environment that reduces physiological strain (e.g., heart rate and body temperatures), improves comfort, improves physical capacities, and reduces the risks of serious heat illness during exposure to heat stress.

Discussion

Employers should reduce workplace heat stress by implementing engineering and work practice controls. Engineering controls work by focusing on removing the hazard at the source before it comes into contact with the worker, while work practice controls are focused on changing how the job is performed in order to minimize worker exposure to the hazards.

Proper Hydration

- Dehydration is the primary cause of heat stress. Replacing fluids lost from sweating is the single most important way to control heat stress and keep workers productive, safe, and alert.
- The first choice should be water. Encourage workers to drink one cup of cool water every 15 to 20 minutes even if they are not thirsty.
- Make sure everyone understands thirst is not a good indicator that body fluids need replacement.
- For un-acclimatized individuals, adding sliced fresh fruit to a container of water can help bolster lost electrolytes.
- It's important to avoid drinks that contain caffeine or alcohol. They promote loss of fluids through increased urination.

Acclimatization

The first days on the job are the most dangerous! Acclimatization enhances the person's tolerance to the heat. People need to adjust (acclimate) to hot working conditions over a few days. Gradually increase workers' time in hot conditions over 7-14 days. OSHA has found that almost half of heat-related deaths occur on a worker's very first day on the job, while over 70% of heat-related deaths occur during a worker's first week.

- Establish an acclimatization schedule as environmental temperatures increase. Gradually increase the time you spend in the heat. Follow the schedule when workers are first assigned and when workers return from an extended absence.
- Closely watch employees for the first 14 days or until they are fully acclimatized.
- Non-physically fit workers require more time to fully acclimatize.
- Acclimatization can be maintained for a few days of no heat exposure
- Taking breaks in air conditioning will not affect acclimatization.

Conclusion

Hot environmental conditions can affect your body. Be aware of the signs or symptoms caused by hyperthermia or heat stress and take appropriate action to correct the situation. If you act quickly, the effects of heat stress may be controlled and lessened.

Group activity

Ask the group members to identify those who are most likely to suffer from the effects of high temperatures and humidity.

- Those who take certain medications.
- Those in poor physical condition.
- Those who suffer from illnesses such as diabetes, hypertension, or cardiovascular disease.
- Those involved in heavy physical exertion.
- Individuals wearing protective clothing.

Ask what one can do to mitigate heat stress exposure.

- Employers should reduce workplace heat stress by implementing engineering and work practice controls.
- Engineering controls might include those that:
 - Increase air velocity.
 - Use reflective or heat-absorbing shielding or barriers.
 - Reduce steam leaks, wet floors, or humidity.
- Work practice recommendations include the following:
 - Limit time in the heat and/or increase recovery time spent in a cool environment.
 - Reduce the metabolic demands of the job.
 - Use special tools (i.e., tools intended to minimize manual strain).
 - Increase the number of workers per task.
- Train supervisors and workers about heat stress.
- Implement a buddy system where workers observe each other for signs of heat intolerance.
- Require workers to conduct self-monitoring and create a work group (i.e., workers, a qualified healthcare provider, and a safety manager) to make decisions on self-monitoring options and standard operating procedures.
- Provide adequate amounts of cool, potable water near the work area and encourage workers to drink frequently.
- Implement a heat alert program whenever the weather service forecasts that a heat wave is likely to occur.
- Institute a heat acclimatization plan and increase physical fitness.

Ask the group what fluids are best for rehydration.

Answers given should include water and electrolyzed sports drinks. Adding fresh fruit to water can also help replace lost electrolytes.

Ask what one can do to recognize symptoms of heat stress.

Communication between coworkers and supervisors is key. Symptoms of heat stress include excessive thirst, weakness, headache, loss of consciousness, muscle cramps, nausea, and dizziness.

Resources

[OSHA: Safety and Health Topics – Heat](#)

[OSHA-NIOSH: Heat Safety Tool Smart Phone App](#)

[National Integrated Heat Health Information System](#)

[American Society of Safety Professionals: How to Recognize and Prevent Occupational Heat Stress](#)

[National Institute for Occupational Safety and Health \(NIOSH\) web page on heat stress](#)