



Goal

This program provides information on keeping workers healthy in the heat and preventing heat illness.

Objective

The participant will understand how to address the heat index, prevent heat illness, recognize the symptoms of heat illness and administer first aid.

Introduction

Many people are exposed to heat on the job, whether from working outdoors in hot weather and direct sun or hot indoor environments such as steel foundries. Every year, thousands of workers, regardless of age or physical condition, are affected by occupational heat exposure, and heat illnesses can even lead to death. Knowledge to prevent heat illness and recognize the symptoms in yourself or your co-workers can keep everyone safer in the heat.



Health Effects of Heat

Just as cars can overheat, so can your body. When you're working in a hot environment, the body must get rid of excess heat to maintain a stable internal temperature, which is usually accomplished by circulating blood to the skin and through sweating. If you're in a hot environment, it becomes more difficult for your body to accomplish cooling down. If the humidity is too high to allow sweat to evaporate, the sweating is not an effective way for the body to cool. When the body can't cool down any more, it starts to store heat, so the body's core temperature rises and the heart rate increases. Eventually, it will be more difficult to concentrate, you may become irritable or sick, and you won't feel like drinking any fluids. Going on in this manner can lead to fainting or even death.

How Hot is Too Hot?

There are many indications that the heat is rising to a level that requires a few more safety considerations. A few things to consider are:

- Rise in temperature
- Increase in humidity
- Sun gets stronger (moves directly overhead)
- There is no air movement
- No controls are in place to reduce the impacts of heat-radiating equipment
- Protective clothing or gear is worn
- Strenuous work

Heat Index - The heat index takes both temperature and humidity into account to give a "real feel" of the weather, or how hot the day feels as opposed to how hot it really is. The higher the heat index, the more prevention methods should be practiced.



Prevention

There are several opportunities to make the work environment healthier by taking steps to prevent heat-related illness or reduce the risk of developing heat-related health problems.

Water, Rest, Shade

Various work practices can be put into place to prevent heat illness. When working outdoors in an area with direct sunlight, employers should provide a tented area for shade, provide adequate, cool drinking water, and have an emergency plan in place in the event medical services are required.

Some other prevention methods are:

- Drink small amounts of water frequently, at least every 15 minutes, even if not thirsty
- Rotate job functions to minimize overexertion and heat exposure
- Schedule heavier work for cooler times of the day/work shift or, if possible, reduce physical demands during hot weather

- Watch out for your co-workers for symptoms of heat-related illness and let a supervisor know of any concerns
- In some situations, physiological monitoring may be necessary to measure a worker's heart rate and body temperature

Engineering Controls

If the work environment is indoors, some of the following engineering controls can reduce workers' exposure to heat:

- Air conditioning (e.g., in break rooms or vehicle cabs)
- Increased general ventilation
- Cooling fans
- Local exhaust ventilation at points of high production or moisture (e.g., exhaust hoods in laundry rooms)
- Reflective shields to redirect radiant heat
- Insulation of hot surfaces
- Elimination of steam leaks

Personal Protective Equipment

While some PPE can increase the risk of heat-related illness (e.g., certain types of respirators or impermeable clothing), some protective gear can offer more protection depending on the task being performed:

- Insulated gloves or suits
- Reflective clothing or infrared reflecting face shields
- A garment with pockets meant to be filled with ice packs
- Breathable, light-colored clothing and hats

Acclimatization

An important consideration for working in heat is acclimatization, which is the process of gradually adjusting to an environment. Think about getting a new goldfish – when you take that goldfish home in its little baggy of water the fish is used to, it's not advised to immediately pour the bag and the fish directly into its new fishbowl – this could lead to serious stress and even death of your new fishy friend! You want to acclimate the fish to the new water first because the water in its new bowl is a completely different environment than the fish is accustomed to. Like slowly introducing a fish to new water, you want to slowly introduce yourself or your workers to working in high heat conditions.

New workers, and workers who have been away from high heat for more than a week, will be the most prone to developing heat illness if exposed to 100% workload on the first day on the job. Adjustment to heat generally takes between 5 and 7 days, but can extend to several weeks in some circumstances (e.g., the individual, medications or medical conditions). Consider beginning with 20% workload on the first day, and increasing the workload by no more than an additional 20% each subsequent day.

Heat-Related Illnesses – Their Symptoms and Necessary First Aid

The first steps for all heat-related illnesses are the same: have the worker sit or lie down in a cool, shaded area, and provide cool water to drink. In addition to these steps, look at the different types of heat-related illness and other steps to respond to symptoms.



Heat Stroke

Heat stroke is the most serious form of heat-related illness. It happens when the body becomes unable to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat.

Symptoms: Confusion; fainting; seizures; excessive sweating or red, hot, dry skin (indicating sweating has stopped); very high body temperature

First Aid: **Immediately call 911.** While waiting for help to arrive, place in a cool, shaded area; provide cool water to drink; loosen clothing and/or remove outer clothing; fan air on them and place cold packs in their armpits; wet them with cool water and apply other ice packs as available; stay with them until help arrives.

When to go to the doctor: **Immediately**



Heat Exhaustion

Heat exhaustion is the body's response to loss of water and salt from heavy sweating. Someone experiencing heat exhaustion should be excused from work for the remainder of the day.

Symptoms: Cool, moist skin; heavy sweating; headache; nausea or vomiting; dizziness; light headedness; weakness; thirst; irritability; fast heart beat

First Aid: Place in a cool, shaded area; provide cool water to drink; cool them with ice packs or cold compresses

When to go to the doctor: If signs or symptoms worsen or do not improve within 60 minutes



Heat Cramps

Heat cramps are caused by the loss of body salts and fluid during sweating. Low salt levels in muscles cause painful cramps. Tired muscles—those used for performing the work—are usually the ones most affected by cramps. Cramps may occur during or after working hours. Workers experiencing heat cramps should wait a few hours before returning to strenuous work tasks.

Symptoms: Muscle spasms; pain; usually in abdomen, arms, or legs

First Aid: Place in a cool, shaded area; provide cool water to drink

When to go to the doctor: If the cramps don't go away.

Heat Rash

Heat rash, also known as prickly heat, is skin irritation caused by sweat that does not evaporate from the skin. Heat rash is the most common problem in hot work environments.

Symptoms: Clusters of red bumps on the skin; often appears on neck, upper chest, or folds of skin

First Aid: Place in a cool, shaded area; provide cool water to drink; keep the affected area dry; move work to a cooler, less humid environment when possible

When to go to the doctor: Generally not necessary as the heat rash will subside on its own

Daily Reminders

At the start of each workday, use a checklist to consider the following:

- Water
 - Is there plenty of fresh, cool drinking water available?
 - Are water coolers refilled throughout the day?
- Shade
 - Is there shade available for breaks and if workers need to recover?
- Training – do the workers know the:
 - Common signs and symptoms of heat illness?
 - Proper precautions to prevent heat illness?
 - Importance of acclimatization?
 - Importance of drinking water frequently, even if they are not thirsty?
 - Steps to take if someone is having symptoms?
- Emergencies
 - Does everyone know who to notify if there is an emergency?
 - Can workers explain their location if they need to call an ambulance?
 - Does everyone know who will provide first aid?
- Drink water often, Rest in the shade, Report heat symptoms early, and Know what to do in an emergency.

Summary

You may not always be able to avoid heat exposure, but it is important to know your body's limitations and how to use techniques to prevent heat illness. Prevention is key and knowing how to identify the symptoms when they arise is important for swift first aid. Always reach out to a supervisor if you notice someone else is having symptoms, as you're more likely to recognize it than the person affected. Keep in mind – **Water, Rest, Shade**.

Review

1. There is no way for the body to overheat because it has ways to get rid of excess heat.
True / False
2. The heat index tells how it really feels outside by combining temperature and humidity levels.
True / False
3. Heat illness prevention methods include:
 - a. Personal protective equipment
 - b. Water, Rest, Shade
 - c. Engineering controls
 - d. All of the above
4. Acclimatization is the process of:
 - a. Working a full day in the sun after you have been sick
 - b. Refraining from climbing a ladder on a hot day
 - c. Allowing yourself several days to get used to working in a hot environment
 - d. None of the above
5. If someone appears to be suffering from heat stroke, which of the following should be done first?
 - a. Alert EMS by calling 911
 - b. Give the victim cool water to sip
 - c. Remove excess clothing
 - d. Check their mental status by giving them a short memory quiz
6. For all heat-related illnesses, two steps for first aid are placing the victim in a cool, shaded area and giving them cool water to drink.
True / False

Answers

1. False (if the humidity is too high to allow sweat to evaporate, this cooling mechanism isn't effective)
2. True
3. D
4. C
5. A
6. True

For more information on heat-related illness and prevention see the Service Lloyds website. In Risk Control's Training Materials section, we have additional resources including:

- Heat Illness Prevention Program – Sample Safety Program
- Sun Safety – Toolbox Talk
- Parlay Handouts:
 - The Hazards of Heat

Remember to practice Safety; don't learn it by accident.

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