Heat Stress Safety Training Program

Goal

This program is designed to increase employer and employee awareness of the risks of working in hot environments and provide information on measures to reduce those hazards.

Objectives

This program aims to increase employer and employee recognition of the safety and health hazards of working in high heat; factors that increase the risk of heat-related illness; signs and symptoms of heat illness; and first aid and preventive measures that decrease the risk of heat-related illness.

Regulations

Heat-related illnesses are a serious hazard. Although there is not a specific Occupational Safety and Health Administration (OSHA) standard for heat stress, employees are protected under the General Duty Clause of the Occupational Safety and Health (OSH) Act. The General Duty Clause states that employers are required to provide a place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm to their employees.

Factors

For the human body to maintain a constant internal temperature, **the body must rid itself of excess heat**. This is achieved primarily through varying the rate and amount of **blood circulation** to the outer layers of the skin and **releasing fluid** onto the skin by the sweat glands. The **evaporation of sweat** cools the skin, releasing large quantities of heat from the body. As air temperatures approach normal skin temperature, cooling of the body becomes more difficult. If the air temperature is as warm or warmer than the skin, blood brought to the body surface cannot lose its heat. Sweating becomes the primary means of maintaining a constant body temperature. Sweating does not cool the body unless the moisture is removed from

the skin by evaporation. Under high humidity conditions, the evaporation of sweat from the skin is decreased, and the body's efforts to maintain acceptable body temperature may be significantly impaired.

Heat-related illnesses are more likely to occur among new or returning employees who do not get the **time needed to adjust to hot environments**. Fortunately, humans are capable of adjusting to the heat. Employers can reduce the chance of employees experiencing heat-related illnesses by gradually exposing them to a hot environment for progressively more extended periods. This process **usually takes about five to seven days**. Gradual exposure to heat gives the body time to adjust to higher temperatures.

Safety Hazards

Heat tends to promote accidents due to **sweaty palms**, **dizziness**, or the **fogging of safety glasses**. **Mental confusion**, **tiredness**, and **irritability** may occur when an employee becomes overheated. The effect of these conditions can result in poor judgment and unsafe practices.

According to the Bureau of Labor Statistics data for Texas, exposure to environmental heat resulted in 42 work-related deaths from 2011 to 2019.[1] In addition, 3,860 nonfatal cases occurred involving days away from work due to exposure to environmental heat.[2]

Health Hazards

Excessive exposure to a hot environment can bring about a variety of heat-related health problems and illnesses.

Heat Cramps

Heat cramps may occur alone or simultaneously with other heat-related illnesses. Heat cramps are painful muscle spasms caused by sweating while performing hard physical labor in a hot environment. The cramps may be caused by either too much or too little salt. Tired muscles are very susceptible to heat cramps.

Fainting

Fainting may occur when an employee who is not used to the heat stands in one position for an extended period. Moving around, rather than standing still, reduces the possibility of fainting. If an employee faints, they should sit or lie down briefly to recover.

Heat Rash

Heat rash, also known as prickly heat, often occurs in hot, humid environments where sweat does not readily evaporate from the skin. The sweat ducts become clogged, resulting in a rash. Heat rash can

[1] Bureau of Labor Statistics, Occupational Injuries and Illnesses and Fatal Injuries Profiles, Fatal Injuries Numbers, 2011-2019, Texas, Event or Exposure, Exposure to Environmental Heat, All Ownerships. Webpage. https://data.bls.gov/gqt/InitialPage. Accessed June 16, 2021.

[2] Bureau of Labor Statistics, occupational Injuries and Illnesses and Fatal Injuries Profiles, Case and Demographic Numbers, 2011-2019, Texas, Event or Exposure, Exposure to Environmental Heat, All Ownerships. Webpage. https://data.bls.gov/gqt/InitialPage. Accessed June 16, 2021.

be uncomfortable if the rash is extensive or complicated by infection. Taking frequent breaks in a cool place during the workday and regularly bathing and drying the skin can help prevent heat rash.

Heat Exhaustion

Heat exhaustion is caused by the loss of large amounts of fluid, and sometimes salt, by sweating. An employee suffering from heat exhaustion still sweats but may experience the signs and symptoms listed below:

- headache;
- dizziness;
- weakness;
- mood changes, confusion, or irritability;
- feeling sick to the stomach;
- vomiting;
- decreased and dark-colored urine;
- light-headedness or fainting; or
- pale, clammy skin.

Heat Stroke

Heat stroke is the most severe heat-related illness and can quickly be **fatal**. Heat stroke occurs when the body's temperature-regulating system fails, and sweating becomes an inadequate way of removing excess heat. Signs that an employee may have a heat stroke are:

- dry pale skin;
- lack of sweat;
- hot, red skin;
- mood changes, irritability, and confusion;
- seizures; and
- collapse or unconsciousness.

First Aid

First Aid for Heat Cramps, Rash, and Exhaustion

Provide the following first aid to victims experiencing heat cramps, rashes, or exhaustion:

- move the person to a cool, shaded area;
- provide cool water to drink;
- fan the person to cool them;
- place a wet cloth on the person to cool their skin, lay the victim on his or her back, and raise the legs 6 to 8 inches if the individual is dizzy;
- roll the person on his or her side if nausea occurs, and loosen or remove heavy clothing; and
- stay with the victim.

Call for emergency help if the victim does not feel better in a few minutes. If heat exhaustion is not treated, the illness may advance to heat stroke.

First Aid for Heat Stroke

Prompt first aid for someone suffering from the symptoms of heat stroke should include the same first aid steps as on the previous page, plus:

- call for emergency help;
- lay the victim on his or her back unless he or she is unconscious;
- remove any objects close to the victim in case a seizure occurs;
- provide cool water to drink if conscious; and
- place ice packs under the armpits and in the groin area.

Employees at Increased Risk

Employees are at increased risk for heat-related illness when they:

- are dehydrated;
- are fatigued;
- use improper work methods;
- have infrequent exposure to hot temperatures and high humidity;
- are over the age of 40;
- are in poor physical condition or overweight;
- use certain medications, such as antihistamines, diuretics, and some tranquilizers;
- have had prior heat-related illnesses;
- have used drugs or alcohol within the past 24 hours;
- have a heat rash or sunburn;
- wear restrictive or heavy clothing;
- wear certain types of heavy personal protective equipment such as arc flash protection and chemical suits;
- work in direct sunlight;
- work at a task that involves heavy and continuous personal energy expenditure; or
- work in unventilated areas.

Prevention

Employers can protect their employees by following these recommendations:

- train all employees on the signs and symptoms of heat-related illnesses and how to respond;
- schedule the most demanding work during the coolest part of the day;
- encourage a buddy system that allows employees to work in pairs in hot environments;
- provide plenty of cool water and encourage employees to drink one quart per hour with a daily fluid intake limit of no more than 12 quarts;

- encourage employees to wear light-colored, loose-fitting, breathable (cotton) clothing;
- provide frequent short breaks in cool shaded areas;
- encourage employees to avoid eating large meals or consuming caffeine and alcoholic beverages before and during work in hot environments;
- reduce radiant heat (heat coming from hot surfaces like pipes) by placing shields around hot machines or furnaces;
- increase the amount of insulation on furnace walls;
- open windows and doors;
- use exhaust ventilators or air blowers;
- use fans or air conditioning;
- lower humidity levels by installing exhaust hoods over areas that release moisture;
- provide tools and equipment that reduce physical demands on employees;
- monitor remote employees or employees in hot or humid areas frequently;
- hold daily safety briefings to remind employees of high-temperature hazards and ways to mitigate the hazards;
- have emergency phones and emergency phone numbers readily available;
- practice emergency procedures and have them in place for heat-related rescues, such as a confined spaces;
- quiz employees on how to prevent heat-related injuries and ways to prevent and treat them; and
- show extra caution when the heat index is 100°F or above; and when working in direct sun.

Review Questions

1. Name the primary means by which a human body maintains a constant body temperature.
2. How does a hot, humid environment inhibit the body's ability to maintain a constant internal temperature?
3. List four conditions that increase a person's risk of heat-related illness.
4. Describe the first-aid treatment for victims of heat stroke.

Answers

1. Sweating.
2. It decreases sweat evaporation from the skin.
3. Any four of the following: dehydration, fatigue, improper work methods, lack of exposure to hot temperatures and high humidity, older than 40, medications, prior heat-related illnesses, recent alcohol or drug use, heat rash or sunburn, or heavy clothing.
4. Call for emergency help, lay victim on their back unless unconscious, remove nearby objects, and provide ice packs under armpits and groin area.

www.txsafetyatwork.com
1-800-252-7031, Option 2

The Texas Department of Insurance,
Division of Workers' Compensation (DWC)-Workplace Safety
P.O. Box 12050
Austin, TX 78711-2050