Heat Related Illness and Stress Prevention – Quick Tips



It’s important for employers to be aware of the dangers that excessive heat exposure has on employees.

While the hazards of heat exposure are most commonly associated with the summer months, certain jobs such as foundry and boiler room work are hot regardless of the time of year. Heat and humidity combined with physical exertion can do more than just make employees uncomfortable. These variables can lead to a variety of heat-related illnesses, some of which can have grave consequences.

Heat Cramps

Heat cramps are painful muscle spasms. They can occur during and after vigorous exercise or intense physical activity in extreme temperatures. Abdominals, calf and thigh, and the biceps/triceps muscles are most frequently affected but other exerted muscles can cramp as well. Cramping can be alleviated by rest, by drinking water, and by correcting the body’s electrolyte imbalance by drinking sports beverages that contain carbohydrates and electrolytes. The Centers for Disease Control and Prevention (CDC), advises seeking medical help if the worker experiencing cramping has heart problems, is on a low sodium diet, or if the cramps do not subside within an hour.

Heat Rash

Heat rash, or prickly heat, appears as fine red spots or small bumps, usually found where clothing is somewhat restrictive (i.e., on the neck and upper back, chest or arms). This harmless rash is triggered by hot, humid weather when one is dressed too warmly for conditions. The rash develops when skin is persistently wet with perspiration. The small inflamed spots on the skin can become infected. The condition usually disappears when the skin is cooled and dried.

Heat Exhaustion

According to the CDC, heat exhaustion is often considered a precursor to the more serious heat stroke. Their data shows that heat exhaustion occurs 10 times more frequently than heat stroke. Heat exhaustion is a result of exposures to excessive heat and humidity and an insufficient intake of water or sports beverages. All combined this can lead to dehydration. Heat exhaustion is usually accompanied by a slightly elevated core body temperature of 38-39 degrees Celsius (C), or 100.4-102.2

degrees Fahrenheit (F) and the symptoms include the following:

- Rapid pulse
- Heavy sweating
- Headache
- Nausea
- Vertigo
- Weakness
- Thirst
- Irritability
- Decrease in urine production

The Occupational Safety and Health Administration (OSHA), advises that any worker exhibiting symptoms of heat exhaustion should be taken to a clinic or emergency room for medical evaluation and treatment. They also recommend the following for those showing signs of heat exhaustion:

- If medical care is not available, call 911 immediately
- Make sure that someone stays with the worker until help arrives
- Remove unnecessary clothing including shoes and socks
- Cool the worker with cold compresses to the head, neck and face, or have the worker wash his or her head, face and neck with cold water
- Encourage frequent sips of cool water

Untreated heat exhaustion can lead to heatstroke, a life-threatening condition that occurs when your body temperature becomes elevated to critical levels (40 C or 104 F or higher).

Heat Stroke

Heat Stroke is the most serious heat-related health problem. Heat stroke is caused by an overexposure to extreme heat and humidity when the body's temperature regulating system fails and body temperature rises to critical levels (40 C or 104 F or higher). Heat stroke is a medical emergency that may rapidly result in death.

According to the CDC, heat stroke can occur in two forms – either classic or exertional. In its "Criteria for a Recommended Standard Occupational Exposure to Heat and Hot Environments," the CDC describes the differences between the two. Classic heat stroke generally occurs in sedentary individuals and includes a major disruption of central nervous system function, a lack of sweating and rectal temperature in excess of 41 C (105.8 F). Young children and the elderly are most likely to incur classic heat stroke. Exertional heat stroke occurs in physically active individuals between the age of 15 and 45. Unlike classic heat stroke, these victims will very often continue sweating. With exertional heat stroke, the skeletal muscle often rapidly breaks down, which is called acute rhabdomyolysis. It's also more common for those with exertional heat stroke to experience renal (kidney) failure.

According to OSHA, the following symptoms are exhibited by individuals suffering from heat stroke:

- Confusion, altered mental status, slurred speech
- Loss of consciousness
- Seizures
- Very high body temperature
- Hot, dry skin or profuse sweating

Heat stroke is an extreme medical emergency requiring immediate medical

attention. OSHA recommends while first aid measures are being implemented to call 911 and get emergency medical assistance as soon as possible. They also advise to:

- Make sure someone stays with the worker until help arrives
- Move the worker to a shaded, cool area and remove the outer clothing
- Wet the worker with cool water and circulate the air to speed cooling
- Place cold wet cloths or ice all over the body or wet the worker's clothing with cold water

Even though it is important to replace fluids as soon as possible, liquids should NOT be administered to a victim in an altered mental state of heat stroke—there is a risk of these liquids being aspirated into the lungs. Medical professionals will give intravenous (I.V.) fluids to an individual suffering from heat stroke when they arrive at the scene.

Rhabdomyolysis and Heat Syncope

Two other heat related maladies that the CDC calls out are rhabdomyolysis and heat syncope. As pointed out above, rhabdomyolysis can occur during exertional heat stroke. The CDC defines rhabdomyolysis as "a medical condition associated with heat stress and prolonged physical exertion, resulting in the rapid breakdown of muscle and the rupture and necrosis of the affected muscles." Symptoms are muscle pain, cramping, swelling, weakness, decreased range of motion of the joints, and dark or tea colored urine. Those showing symptoms should stop the activity they're performing, increase hydration and seek immediate medical care. In severe cases of rhabdomyolysis, hospitalization and aggressive treatment with I.V. fluids is needed to minimize kidney damage.

Heat syncope is a fainting episode or dizziness that occurs after prolonged standing or sudden rising from a sitting or lying position during hot and humid conditions. Symptoms of syncope include light-headedness, dizziness, and fainting. Recommended first aid measures are sitting or lying down in a cool place and hydrating after the fainting spell has passed.

Heat-Related Illness Prevention

Currently, OSHA does not have a standard specific to employee exposure to excessive temperatures, either hot or cold. Employers are responsible for furnishing their employees, "employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm ," as stated in the General Duty Clause of the OSH Act of 1970. OSHA has used the General Duty Clause to cite employers who have allowed employees to be exposed to serious physical harm from excessively hot work environments.

While OSHA does not have a high temperature work environment standard for employers to follow, there are resources available to help create a heat illness prevention program. OSHA offers guidance for employers on its Heat Illness Prevention resource page. Here OSHA identifies the core components of a heat illness prevention program. The program should, "provide workers with water, rest and shade; gradually increase workloads and allow more frequent breaks for new workers or workers who have been away for a week or more to build a tolerance for working in the heat (acclimatization); modify work schedules as necessary; plan for emergencies and train workers about the symptoms of heat-related illnesses and their prevention; and monitor workers for signs of illness."

Regarding, acclimatization, OSHA says, "If workers are new to working in the heat or returning from more than a week off, and for all workers on the first day of a sudden

heat wave, implement a work schedule to allow them to get used to the heat gradually." OSHA recommends that new workers and those returning from a prolonged absence should begin with 20% of the workload on the first day, increasing by no more than 20% each following day. OSHA also states, "Full acclimatization may take up to 14 days or longer depending on factors related to the individual such as an increased risk of heat illness due to certain medications or medical conditions, or the environment."

The National Institute for Occupational Safety and Health (NIOSH) offers some more specifics related to program components for employers. For hydration, NIOSH recommends that drinkable water at a temperature of less than 59 F be made accessible near the employees work area. They recommend that employees working in the heat for less than two hours and involved in moderate work activities should drink eight ounces of water every 15-20 minutes, but during prolonged sweating lasting several hours, they should drink sports drinks containing balanced electrolytes. If a sports drink is used, the percentage by volume of electrolytes/carbohydrates should not exceed 8%. And NIOSH indicates that acclimatization for a "non-physically fit individual" may take 50% longer than the time required for a physically fit peer.

Other on-the-job heat-related illness prevention methods include the following:

- Wear loose-fitting clothing
- Schedule hot jobs for the cooler part of the day (early morning or late afternoon)
- Schedule routine maintenance and repair work in hot areas during the cooler seasons of the year
- Provide additional breaks and comfortable break areas
- Add additional personnel to reduce exposure time for each member of a crew
- Permit workers the freedom to interrupt work when they feel extreme heat discomfort

OSHA's Technical Manual discusses specific engineering and administrative control measures in great detail. It also outlines a variety of personal protective equipment (PPE) that can be implemented to reduce the possibility of heat-related illnesses. This reference material is available from OSHA.

Commonly Asked Questions

Q: There seems to be conflicting opinions on the use of salt tablets. When, if ever, are they appropriate for employee use?
A: According to the CDC, "do not take salt tablets unless directed by your doctor. Heavy sweating removes salt and minerals from the body. These are necessary for your body and must be replaced. The easiest and safest way to do this is through your diet. Drink fruit juice or a sports beverage when you exercise or work in the heat."

Q: Are sport drinks any better than water for employees working in high temperature environments?
A: The real key is to keep fully hydrated. During short-term moderate physical exertion, 8-ounces of water every 15-20 minutes is what's recommended by the CDC. The CDC advises the use of sports drinks during periods of prolonged sweating lasting two hours or longer. In these periods of more intense exertion, sports drinks can replenish and rebalance electrolytes levels. If used, the electrolyte/carbohydrate

levels of sports drinks should not exceed 8% by volume.

Sources

OSHA – Heat Illness Prevention Campaign

OSHA Technical Manual

NIOSH's Criteria for a Recommended Standard Occupational Exposure to Heat and Hot Environments

CDC's Extreme Heat Resource Center

The information contained in this article is intended for general information purposes only and is based on information available as of the initial date of publication. No representation is made that the information or references are complete or remain current. This article is not a substitute for review of current applicable government regulations, industry standards, or other standards specific to your business and/or activities and should not be construed as legal advice or opinion. Readers with specific questions should refer to the applicable standards or consult with an attorney.

Source: Grainger Know How – https://www.grainger.com/know-how