Introduction

Many businesses have operations that require employees to work outdoors or in warehouses, shops or work areas where they may be exposed to temperature extremes. One such situation that can have serious consequences is excessive heat, which raises the body's temperature beyond its natural cooling ability. When exposure occurs, measures must be taken to lower the body temperature to avoid heat related illnesses and even death.

It is difficult to predict who will be affected by heat and when. Workers vary in age, weight, degree of physical fitness, metabolism, ability to acclimate to heat, use of alcohol and drugs, and medical condition. Additionally, environmental factors such as radiant heat, air movement and relative humidity vary. Therefore, it is important to know and understand the various types of problems that can result from exposure to excessive heat and the measures that can be taken to avoid illness or injury.

As a service to our customers, Continental Western Group offers the following information and tips for handling heat stress.
Heat Stress and OSHA

The Occupational Safety and Health Administration recognizes that workers exposed to high temperatures must be protected. Between April and September 2010, the agency investigated approximately 22 workplace fatalities related to heat. They further note that the deaths were preventable had the workers and employers applied the basic principles of water, rest and shade. OSHA has developed a campaign to prevent heat illness in outdoor workers. Information can be accessed through http://www.osha.gov/SLTC/heatillness/index.html.

While OSHA does not have a specific regulation covering heat stress hazards, the “General Duty Clause,” Section 5(a)(1) of the Occupational Safety and Health Act of 1970 (the Act), requires each employer to, “furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm.” OSHA has previously used the General Duty Clause to cite employers that have allowed employees to be exposed to potential serious physical harm from excessively hot work environments.

Heat Disorders and Effects

Various conditions result from excessive heat. While heat stress is the overall term often used to describe the conditions, specific symptoms occur that lead to varying levels of danger. The following list specifically identifies the terms, conditions and symptoms associated with exposure to excessive heat.

HEAT STROKE

- The body’s system of temperature regulation fails and body temperature rises to critical levels
- Caused by a combination of work load and environmental heat load that are difficult to predict and are highly variable
- HEAT STROKE IS A MEDICAL EMERGENCY WHICH CANNOT BE IGNORED. SUMMON EMERGENCY MEDICAL ASSISTANCE OR GET THE VICTIM TO A MEDICAL FACILITY IMMEDIATELY.
- Signs and symptoms:
  - Confusion
  - Irrational behavior
  - Loss of consciousness or convulsions
  - Usually a lack of sweating
  - Hot, dry skin
  - Abnormally high body temperature, which may cause death
- Immediate actions that should be taken upon initial appearance of symptoms:
  - Obtain immediate professional medical treatment
  - Place worker in a shady area and loosen or remove outer clothing
  - Wet skin
  - Increase air movement around the worker to improve evaporative cooling
  - Replace fluids as soon as possible
- Victim’s survival depends on degree of physical fitness, timeliness and effectiveness of first aid and professional treatment
- No suspected victim of heat stroke should be allowed to be left unattended or to go home unless specifically approved by a physician
HEAT EXHAUSTION

- Signs and symptoms:
  - Headache
  - Nausea
  - Vertigo
  - Weakness
  - Thirst
  - Giddiness
  - Fainting

- Should not be taken lightly as symptoms can be very dangerous if the worker is operating equipment, machinery, or is in a hazardous area
- Be overly cautious as the symptoms are somewhat similar to those of heat stroke, a deadly condition
- Responds readily to prompt treatment
- Remove the victim from the hot environment, give fluid replacement, and encourage adequate rest
- If vomiting continues, seek immediate professional medical attention

HEAT CRAMPS

- Usually caused by hard physical labor in a hot environment
- Heat cramps may be a warning sign of impending heat exhaustion
- Result from an electrolyte imbalance caused by sweating
- Can be caused by both too much or too little salt
- Appears to be caused by lack of water replenishment
- Thirst cannot be relied on as a guide to the body’s need for water
- Water should be taken every 15 to 20 minutes in hot environments
- Apply firm pressure on cramping muscles or massage gently to relieve spasm
- Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, loss of sodium may occur. A commercially available carbohydrate-electrolyte replacement liquid may minimize physiological disturbances during recovery.

HEAT COLLAPSE

- Heat collapse (fainting) occurs when the brain does not receive oxygen because blood pools in the extremities and the worker may lose consciousness
- The signs and symptoms are similar to heat exhaustion
- Onset is rapid and unpredictable
- Workers should be gradually acclimatized to hot environments

HEAT RASHES

- Most common problem in hot work environments
- Commonly called “prickly heat”
- Appears as red bumps in areas where clothing is restrictive
- As sweating increases, the bumps give rise to a prickly sensation
- Occurs where skin is persistently wetted by sweat that does not evaporate
- May become infected if not treated
- Will generally disappear when the worker returns to a cool environment

HEAT FATIGUE

- Results from lack of acclimatization
- Symptoms include impaired performance of skilled sensorimotor, mental, or jobs that require vigilance
• No treatment except to remove the heat stress before a more serious condition develops
• Use a program of acclimatization and training for work in hot environments

The above information is from OSHA’s Technical Manual, Section III, Chapter 4 and can be accessed at their website.

**General Tips**

OSHA also offers tips on preventing heat stress for workers. After understanding the signs, symptoms, and nature of heat-related problems, incorporate them into your workplace.

• Wear sunscreen with a sun protection factor (SPF) of 15 or greater and reapply frequently
• Wear a wide brim hat that does not interfere with any personal protective equipment
• If possible, set up work in a shaded area or provide a shaded area for rest breaks
• If possible, schedule work for early morning or evening hours, especially heavier work, to reduce exposure to direct sunlight
• Drink 4 to 8 ounces of water or sports drink every 20 minutes while working in hot, humid conditions while limiting fluids to no more than 1 ½ quarts per hour & drinking no more than 12 quarts of fluid in 24 hours
• Take frequent breaks in shaded or air conditioned areas
• Know and report heat symptoms immediately
• Know what to do in an emergency
• Become acclimatized to hot and/or humid environments by working shorter hours and gradually increasing exposure over the course of several days
• Wear light colored clothing
• Limit the intake of caffeinated and/or alcoholic beverages
• If Personal Protective Equipment is required, shorten work time and take more frequent breaks
• Consider the use of personal cooling devices, such as cooling vests or suits
• Use the buddy system to monitor one another for signs and symptoms of heat related illnesses
• If someone shows signs of heat illness or stress, do not wait to call for immediate medical attention. Move the individual to a cooler area in the shade, loosen or remove heavy clothing, provide cool drinking water, and fan and mist the person with water.

OSHA encourages employers to:
• Permit workers to drink water at liberty
• Establish provisions for a work/rest regimen so that exposure time to high temperatures and/or work rates is decreased
• Develop a heat stress program that incorporates a training program to inform employees about the effects of heat stress, how to recognize heat-related illness symptoms, and preventive measures
• Consider a screening program to identify health conditions aggravated by elevated temperatures
• Implement an acclimation program for new employees or employees returning to work from absences of 3 or more days
• Identify specific procedures for handling heat-related emergencies
• Establish protocol for first aid to be administered immediately to treat employees displaying symptoms of heat-related illness
Summary

Heat related illnesses are serious and can result in death. Learn the symptoms of heat stress, the proper methods of dealing with heat-related problems, and most importantly preventive measures to lessen the chance of occurrence.

Contact your Continental Western Group Loss Control Representative for additional help with this or other safety topics.