

Heat Stress

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Summer heat can have a detrimental effect on employees and volunteers who work outdoors or within indoor environments with elevated temperatures. Each year more people in the United States die from extreme heat than from hurricanes, lightning, tornados, floods, and earthquakes combined.

BACKGROUND

Heat Stress is influenced by several risk factors: climatic conditions, the work environment, demands of the work, clothing and personal characteristics.

Climatic and environmental conditions that affect the risk of heat-related disorders are air temperature and humidity, air movement, and the temperature of surrounding surfaces which affects radiant heat exchange.

Demands of the work influence the stress on the temperature regulation system. Individual responses to a given work load vary but, as an employee expends more energy, the body's internal metabolic heat production rises. This increases stress on the cardiovascular system to regulate body temperature (i.e., by increasing blood flow to skin). Work-related factors that influence heat stress include work rate, level of physical effort, and duration of activity.

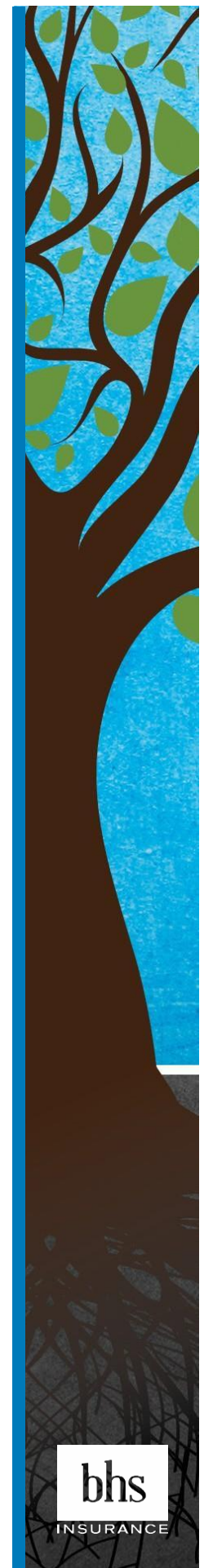
Clothing characteristics such as insulation, permeability, weight, fit and ventilation affect the body's ability to regulate internal temperatures. Other factors that may increase the risk of heat-related disorders include additional equipment, the use of a respirator, or other personal protective equipment (PPE).

Personal characteristics such as age, weight, previous heat stress injury, underlying medical conditions (e.g., diabetes, cardiovascular disorders, chronic pulmonary disease, and thyroid disorders), medication use and overall health and physical fitness contribute to an employee's susceptibility of contracting a heat-related illness.

Working in an environment with heat stress not only increases the risk for specific heat related conditions such as heat exhaustion and heat stroke, but also increases the risk for other adverse events. A study conducted by NIOSH (National Institute for Occupational Safety and Health) links the signs of heat stress (e.g., lower mental alertness and physical performance) to an increase in workplace accidents.

SIGNS AND SYMPTOMS OF HEAT-RELATED DISORDERS

Heat related disorders may occur when there is an exposure to heat risk factors. The chart below illustrates some of the signs and symptoms associated with heat stress. If the employee is experiencing any of these symptoms (excluding heat rash), the employee should be taken to the emergency room for treatment immediately.



Disorder	Signs	Symptoms
Dehydration	Loss of work capacity Delayed response to stimuli	Fatigue Weakness Dry mouth
Heat Exhaustion	High pulse rate, confusion, anxiety Profuse sweating Low blood pressure Pale face, or flushing Body temperature increased but below 104 degrees F. Excessive thirst, decreased urine output	Fatigue, malaise Weakness Blurred vision Dizziness Headache Nausea Loss of appetite
Heat rash	Skin eruptions	Itching skin, prickly sensation
Heat Stroke	Red face Mental status changes such as Disorientation, Confusion or Irritability Hot, dry skin Erratic behavior Collapse Shivering Body temperature >104 F	May be same as those for heat exhaustion (see above)
Heat Cramps	Incapacitating pain in muscle	Muscle cramps (abdominal and lower extremities) Fatigued muscles
Heat Syncope	Brief fainting or near fainting behavior	Blurred vision

PREVENTATIVE CONTROLS

A control is a mechanism used to minimize or eliminate an exposure to a hazard, such as heat. There are three types of controls (e.g. engineering, administrative and personal protective equipment) that can be implemented to reduce exposure to excessive heat. Each person and situation is unique, so controls and their application will vary.

ADMINISTRATIVE CONTROLS

Administrative controls, also known as work strategy controls, are strategies used by supervisors to limit exposure to a hazard. For example, changes to the work schedule (i.e., when and how the job is performed) can limit the amount of time an employee is exposed to elevated temperatures.

ENGINEERING CONTROLS

Engineering controls are physical changes made to the work environment, such as adding fans or air conditioning to an indoor environment.

WORK PRACTICES AND PERSONAL PROTECTIVE EQUIPMENT

Other than hats and loose-fitting clothing, there is a limited selection of personal protective equipment to reduce the risk of heat stress. In some cases, personal protective equipment—such as impermeable protective clothing and respirators—may increase the risk of developing a heat-related disorder.

MONITORING FOR SIGNS AND SYMPTOMS OF HEAT STRESS

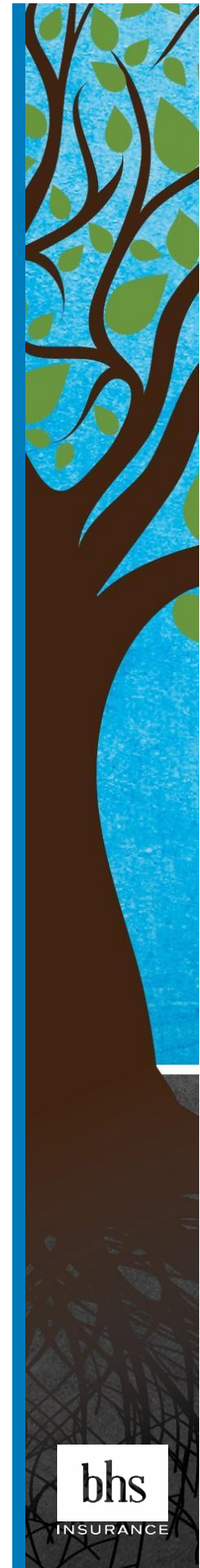
Supervisors, coworkers and employees themselves are responsible for monitoring for the signs and symptoms of heat-related disorders. See the above table for information on recognizing the signs and symptoms of impending heat stress. A supervisor or coworker is often in the best position to observe the onset of a heat-related disorder.

- When heat stress risks are present, supervisors should regularly check workers (by observation and questions) for signs and symptoms of heat stress.
- Take extra care to monitor those at high risk, such as employees who are older or overweight, employees who overexert themselves, and employees with chronic medical conditions including diabetes, heart or lung disease, thyroid disease or high blood pressure. Employees who take certain medications may also be at increased risk and need to check with their physician.
- If you need to work outdoors or within indoor environments with elevated temperatures, monitor yourself for the signs and symptoms of heat-related illness, such as taking your own pulse.
- Use a buddy system. When working in the heat, monitor the condition of your coworkers and have someone do the same for you.
- Supervisors should check to ensure that employees are self-monitoring, and ask for their determinations.

TRAIN EMPLOYEES WHO ARE AT RISK OF HEAT STRESS

Heat stress training should include:

- A review of heat-related disorders and their risk factors.



- Recognition of the signs and symptoms of heat-related disorders, and the importance of monitoring for them.
- Preventive measures that will be used.
- Fluid replacement options and expectations.

ISSUE HEAT ALERTS

When conditions are present that contribute to heat stress, departments and work units are to alert at-risk employees and implement their preventive measures for working in heat. The alert should include a reminder of signs and symptoms, how to control exposure and a re-emphasis of the preventive work strategies to be followed.

EMPLOYEE'S RESPONSIBILITY

Employees who work outdoors or within indoor environments with elevated temperatures have the following responsibilities.

- Participate in your work unit's heat stress training. Learn the signs and symptoms of heat stress, as well as risk factors.
- Take extra care if you are at high risk. You may be at increased risk if you are older or overweight, you overexert, you have a chronic medical condition including diabetes, heart or lung disease, thyroid disease or high blood pressure. If you take medications, you should check with your doctor to see if you are at increased risk because of the effects of these medications.
- Follow the preventive measures recommended for your job.
- Take time to acclimate to heat and humidity. A heat wave is stressful to your body. You will have a greater tolerance for heat if you limit physical activity until you become accustomed to it.
- Stay hydrated by drinking small amounts of cool water frequently, to relieve thirst and maintain adequate urine output.
- Wear appropriate clothing. Choose lightweight, light-colored, loose-fitting clothing.
- Pace yourself. Start slowly and pick up the pace gradually.
- Monitor yourself for the signs and symptoms of heat-related illness, described above.
- When working in the heat, monitor the condition of your co-workers. Ask your coworker to do the same for you.
- Promptly report to your supervisor any known or suspected unsafe conditions or unsafe procedures.

MORE INFORMATION

If you would like a power point training presentation or employee flyers for your institution, please contact Kim Slager (kslager@bhsins.com) or Sharon VanLoon (svanloon@bhsins.com) at BHS Insurance.

