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EH&S FACT SHEET
Environment, Health and Safety Information for the Berkeley Campus

Heat Illness Prevention and Response

Work in hot environments can result in heat illness, a group of medical conditions caused by the body's inability to cope with heat. Heat illness includes heat cramps, heat exhaustion, fainting, and heat stroke. All university employees who work outdoors may be at risk for heat illness including, but not limited to, field researchers, grounds crews, maintenance workers, and special event staff.

This fact sheet provides information about heat illness and establishes Berkeley campus and field procedures for preventing and responding to it.

Supervisors are responsible for ensuring that the following measures are taken to prevent heat illness among employees and completing the Work Planning and Site Checklist to document that controls are in place whenever temperatures are expected to reach 80° F or higher.

Procedures for Preventing Heat Illness

Take Breaks - Workers must be provided a preventative recovery period in shade for at least five minutes to recover from heat in order to prevent heat illness. Rest breaks also provide an opportunity to drink water.

Allow for Acclimatization - Acclimatization is a temporary adaptation of the body to work in heat. It occurs gradually as a person is exposed to hot conditions, and takes 4 to 14 days for most people. Training about heat illness prevention is needed before starting work in hot conditions and, when possible, workers should be encouraged to take more breaks and perform less strenuous tasks during the acclimatization period.

Provide Access to Shade - Wide brimmed hats can decrease the impact of direct heat from the sun. If possible, work should be performed in the shade. If not, supervisors must provide a shaded area for breaks such as under trees, canopies, umbrellas, or other structures that block direct sunlight. Shade is not considered adequate for breaks if heat in the area defeats the cooling purpose of shade. A car sitting in the sun, for example, does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.

Drink Water - Keep hydrated. Frequent drinking of water is encouraged. Supervisors must ensure that employees have access to one quart (four cups) of fresh, pure and suitably cool drinking water per hour for the entire shift when the work environment is hot. During periods of high heat, drinking water is very important; avoid caffeinated or alcoholic beverages. Generally, dark yellow-colored urine indicates dehydration and the need to drink more water.

Identify, Evaluate, and Control Exposures - Supervisors should monitor employees closely for signs and symptoms of heat illness, particularly when employees are not acclimated, and when a heat wave occurs. Employees, supervisors, and safety committees should periodically discuss and update procedures to identify, evaluate and control high risk tasks for heat illness. The Office of Environment, Health & Safety (EH&S) is available upon request to help assess various job tasks and environmental conditions and to provide heat illness prevention training.

All workers should be accounted for during and at the end of a work shift. There is no absolute cutoff below which work in heat is not a risk. As a general rule, actions

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to prevent heat illness should be implemented when temperatures approach 80 ° F. During heat waves, it is advised that strenuous outdoor work be performed, if necessary, early in the morning or late in the afternoon when heat is less intense.

Monitor Weather Conditions – Supervisors are responsible for monitoring weather conditions and heat waves at specific locations where work activities are planned. Useful web resources include weather.gov and wunderground.com, or, a thermometer may be used at the work site.

Additional High Heat Controls – When the outdoor temperature exceeds 95° F a pre-shift meeting is required, and effective communication must be maintained. Whether by voice, observation, or phone or text, employees must be able to contact a supervisor at all times. Supervisors must monitor employees for alertness and signs or symptoms of heat illness. They must also remind employees to drink plenty of water throughout the work shift and take a mandatory 10-minute cool-down break in the shade every two hours. Any new employees that have been working for less than 14 days must be closely supervised at all times.

Signs and Symptoms

Heat illness is the result of dehydration and elevated body temperatures. Common early symptoms and signs of heat illness include headache, muscle cramps, and unusual fatigue. Progression to more serious illness can be rapid and include unusual behavior, nausea or vomiting, weakness, rapid pulse, excessive sweating or hot dry skin, seizures, and fainting or loss of consciousness. Always remember that mild heat illness has the potential to become a severe life-threatening emergency if not treated properly.

Table 1. Types of Heat Illness

Type of Heat Illness	Signs and Symptoms	Treatment
Heat Edema	Swelling of the hands, feet and ankles is common during the first few days in a hot environment.	Heat edema is usually self-limiting and typically does not require any treatment.
Heat Rash	Sweat ducts become plugged, resulting in itchy, red, bumpy rash on areas of the skin kept wet from sweating.	Cool and dry the affected skin and avoid conditions that may induce sweating.
Heat Cramps	Painful muscle spasms or cramps that usually occur in heavily exercised muscles. Spasms often begin when a person is resting after exercise.	Rest in a cool environment and gently apply steady pressure to the cramped muscle. Drink cold water containing a small amount of salt or a diluted sports hydration beverage.
Heat Exhaustion	Faintness, dizziness, headache, increased pulse rate, restlessness, nausea, vomiting, and possibly even a brief loss of consciousness.	This is the most common type of heat illness. Stop all exertion and move to a cool shaded place. Remove constrictive clothing. Drink water. Loosen clothing and spray clothes and exposed skin with water and fan. Cool by placing ice or cold packs along neck, chest, armpits and groin (do not place ice directly on skin). Do not return to work in the sun. If condition does not improve seek medical help. Heat exhaustion can progress to heat stroke.

Type of Heat Illness	Signs and Symptoms	Treatment
Heat Stroke	Victim's skin is hot, usually dry, red or spotted. Body temperature is usually 104° F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Anyone with an elevated temperature and an altered mental state should be considered a victim of heat stroke. The victim will also likely have increased heart and breathing rates. Seizures, coma and death are possible.	Call 911 or seek medical help immediately. Heat stroke is a life threatening medical emergency. A victim can die within minutes if not properly treated. Efforts to reduce body temperature must begin immediately! Move (gently) to a cooler spot or shade. Loosen clothing and spray clothes and exposed skin with water and fan. Cool by placing ice or cold packs along neck, chest, armpits and groin (do not place ice directly on skin).

Environmental Risk Factors

Working conditions that contribute to the risk of heat illness include air temperature, relative humidity, radiant heat from the sun or other sources, conductive heat from the ground or other sources, air movement, workload severity and duration, and clothing worn by employees.

Personal Risk Factors

Factors such as an employee's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications may affect the body's water retention and other physiological response to heat.

Employees suffering from heat illness, or believing a preventative recovery period is needed, must be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. Such access must be permitted at all times.

Other measures for responding to specific heat illnesses are listed in Table 1.

Procedures for Responding to Heat Illness

Supervisors should reiterate to all employees the importance of immediately reporting any symptoms or signs of heat illness in themselves or co-workers and should remind employees what to do if emergency medical treatment is needed. Procedures for contacting emergency medical services, and if necessary, transporting employees to a point where they can be reached by an emergency medical provider, must be provided.

For any life-threatening emergency, call 911. On the Berkeley campus, urgent care services are available at University Health Services (Tang Center) at 2222 Bancroft Way during working hours. Call ahead if possible at (510) 642-3188. The nearest emergency room to the campus is at Alta Bates Hospital, 2450 Ashby Avenue, just east of Telegraph Avenue.

Obtaining Emergency Medical Services

Supervisors must ensure that employees are able to provide clear, concise directions to their work site. In remote field locations, developing procedures for emergency medical services may require extensive planning, and supervisors must ensure that employees are informed of exactly how and where medical attention may be received. At remote work sites, at least one member of your group must have current first aid training. To help with planning, a Field Safety Plan template is available on the EH&S website at ehs.berkeley.edu/field-safety.

Documented Training

Supervisors and employees must be provided with training on the information summarized in this fact sheet before they begin work in hot environments. All such training must also be documented. Departments with employees who are likely at risk of heat illness should refer to this fact sheet as part of their Injury and Illness Prevention Program (IIPP).

Further Information

For additional information on heat illness, contact the Office of Environment, Health & Safety at (510) 642-3073, or ehs@berkeley.edu, or the University Health Services (510) 642-2000.

Other Resources

California Occupational Safety and Health Administration (Cal/OSHA) heat illness prevention resources are available at their website:
http://www.dir.ca.gov/dosh/HeatIllnessInfo.html

Centers for Disease Control (CDC) guidance on heat stress:
http://www.cdc.gov/niosh/topics/heatstress/

Training Documentation

Name (Printed)	Signature	Date