ENVIRONMENTAL HEALTH & SAFETY
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Heat Stress and Occupational Heat Exposure

Many people are exposed to heat on the job, in both indoor and outdoor heat environments. Operations involving high air temperatures, radiant heat sources (e.g., sunlight, hot exhaust), high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for causing heat-related illness.

Why is Heat a Hazard?

When a person works in a hot environment, the body must get rid of excess heat to maintain a stable internal temperature. It does this mainly through circulating blood to the skin and through sweating.

When the air temperature is close to or warmer than normal body temperature, cooling of the body becomes more difficult. Blood circulated to the skin cannot lose its heat. Sweating then becomes the main way the body cools off. But sweating is effective only if the humidity level is low enough to allow evaporation, and if the fluids and salts that are lost are adequately replaced.

If the body cannot get rid of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the person begins to lose concentration and has difficulty focusing on a task, may become irritable or sick, and often loses the desire to drink. The next stage is most often fainting, then eventually death if the person is not cooled down.

Exposure to heat can also increase the risk of injuries because of sweaty palms, fogged-up safety glasses, dizziness, and burns from hot surfaces or steam.

Heat and First Aid

Excessive exposure to heat can cause a range of heat-related illnesses, from heat rash and heat cramps to heat exhaustion and heat stroke. Heat stroke can result in death and requires **immediate medical attention**. Each of these heat-related illnesses have specific signs and symptoms, outlined in the table below. The table also details first aid measures to take for individuals experiencing each heat-related illness.

When a heat-related illness presents itself, it is of the utmost importance that the affected individual be removed from the high-risk environment to a cooler, better ventilated area. The individual's supervisor should be informed, then depending on the severity of the illness, emergency services should be contacted through Community Safety at (503) 788-6666 or by simply dialing 6666 on a campus phone.

It is also important to recognize areas and tasks where heat-related illnesses are more likely to occur, and to plan accordingly. For example, at Reed College, a common higher-risk area would be the boiler room in the physical plant. A higher-risk task would be strenuous outdoor activity, such as digging with a shovel or removing fallen branches. Directly prior to and during the performance of higher-risk work, the following guidelines should be observed to prevent or minimize heat-related illness:

- Workers should communicate with a supervisor to ensure that someone outside of the higher-risk area is aware that higher-risk work is being undertaken and is able to respond to a heat-related

emergency if one were to occur. Workers should also coordinate the minimization of heat exposure and overexertion with a supervisor.

- Workers should avoid caffeine and alcohol prior to undertaking higher-risk work, and wear light-colored, lightweight, and loose-fitting clothing.
- Workers should ensure that they have adequate potable (safe for drinking) water close to the work area, and should drink small amounts frequently (around one pint or 500mL of water per hour, with no more than 15 minutes between drinks).
- Workers should not undertake higher-risk work without supervision. At least one other worker should be present to watch for symptoms of heat-related illness and administer appropriate first aid to anyone who is developing a heat-related illness.
- Rather than being exposed to heat for extended periods of time, workers should, wherever possible, distribute the workload evenly over the day and incorporate work/rest cycles.
- If possible, physical demands should be reduced during hot weather, or heavier work scheduled for cooler times of the day.
- Job functions should be rotated among workers to minimize overexertion and heat exposure.
- Workers who are new to working in the heat or have been away from work a week or more should start slow, with more frequent breaks, gradually increasing workloads during the first week of work to become acclimatized to high heat.

Illness	Symptoms	First Aid*
Heat stroke	▪ Confusion ▪ Fainting ▪ Seizures ▪ Excessive sweating or red, hot, dry skin ▪ Very high body temperature	▪ Call Community Safety at ext. 6666, and direct the dispatcher to call 911 about a heat stroke emergency While waiting for help: ▪ Place worker in shady, cool area ▪ Loosen clothing, remove outer clothing ▪ Fan air on worker; cold packs in armpits ▪ Wet worker with cool water; apply ice packs, cool compresses, or ice if available ▪ Provide fluids (preferably water) as soon as possible ▪ Stay with worker until help arrives
Heat exhaustion	▪ Cool, moist skin ▪ Heavy sweating ▪ Headache ▪ Nausea or vomiting ▪ Dizziness ▪ Light headedness ▪ Weakness ▪ Thirst ▪ Irritability ▪ Fast heart beat	▪ Have worker sit or lie down in a cool, shady area ▪ Give worker plenty of water or other cool beverages to drink ▪ Cool worker with cold compresses/ice packs ▪ Take to clinic or emergency room for medical evaluation or treatment if signs or symptoms worsen or do not improve within 60 minutes. ▪ Do not return to work that day
Heat cramps	▪ Muscle spasms ▪ Pain ▪ Usually in abdomen, arms, or legs	▪ Have worker rest in shady, cool area ▪ Worker should drink water or other cool beverages ▪ Wait a few hours before allowing worker to return to strenuous work ▪ Have worker seek medical attention if cramps don't go away
Heat rash	▪ Clusters of red bumps on skin ▪ Often appears on neck, upper chest, folds of skin	▪ Try to work in a cooler, less humid environment when possible ▪ Keep the affected area dry

* Remember, if you are not a medical professional, use this information as a guide only to help workers in need.

For more information, consult the OSHA QuickCard "Protecting Workers from Heat Stress" or contact April Sams at karra@reed.edu or (503) 777-7788.