



# Heat Exhaustion and Heat Stroke

## Safe Work Practices for Workers in Hot Environments

Some jobs must unavoidably take place in hot working environments. Working in conditions of extreme heat combined with additional stresses to the body from physical activity, loss of fluids, fatigue, and various other factors, can lead to dangerous health effects or can jeopardize worker safety. However, if the risks are understood and precautions are taken, work in hot environments can be performed in relative comfort and security.

There are four environmental factors which can contribute to the amount of heat stress a worker may experience on the job -temperature, humidity, radiant heat, and air velocity. Other contributing factors may be the worker's age, weight, fitness, medical condition, and the ability to acclimatize to the heat. If the temperature of the work environment cannot be controlled, then every effort should be made to assist the individuals to maintain a safe and healthy body temperature while working in a high-heat environment.

The human body naturally strives to maintain a balanced operating temperature (normally 98.6 degrees Fahrenheit), even when it's exposed to extreme heat. Breathing, sweating, blood circulation, and the body's adaptation to the hot environment combine to enable the body to remain within a safe temperature range. But sometimes heat from the sun, radiant heat from a hot surface or heat from hot processes can overwhelm the body's cooling mechanisms and result in mild to severe health disorders. These heat-related disorders include heat rash, heat cramps, heat syncope, heat exhaustion, and heat stroke.



Heat exhaustion and heat stroke are the most serious conditions and result when the body is subjected to more heat than it can handle. How much is too much? It varies, depending on the person and the situation. If improperly treated, heat stroke can be life-threatening. However, many heat-related health problems can be prevented or the risk of developing them reduced by following a few basic precautions:

**Acclimatization** - Give workers time to get used to the heat. With gradual increased exposure, workers become better able to tolerate the heat. Provide cool, shaded rest areas where workers can take periodic breaks as needed. Longer or more frequent breaks may be necessary when it's very hot or the work is especially strenuous. Job sharing or heavy work rotation among several workers can also lessen the heat load on workers.

**Rehydration** - Sweating is part of the body's natural cooling system, but it does result in water loss. The way to replace this loss and help the body continue to cool itself is to drink water or electrolyte-replacement "sport drinks" throughout the day, at least one cup every 20-30 minutes. Thirst is not enough to insure sufficient water intake. Workers should be encouraged to drink before, during, and after work. Alcohol, coffee, tea, and caffeinated soft drinks, which cause dehydration, should be avoided.

**Appropriate Dress** - Thin, light-colored, loose-fitting clothing aids in evaporation and allows air movement near the skin. For some jobs, clothing with built-in air cooling features is appropriate. Reflective clothing can shield the body from radiant and convective heat. Those who work outdoors should wear a hat and sunscreen for increased protection against the sun's rays.

**Physical Conditioning** - Workers who are in good physical condition are better able to tolerate higher work temperatures. Encourage workers to stay in shape, avoid alcohol, and eat light, healthy meals. Heavy meals contribute to body heat and divert blood to the digestive system.

**Engineering Controls** - Fans, ventilators, exhaust systems, and air coolant systems help keep worksite temperatures to adaptable levels. Other controls such as installing heat shields and insulating heat-producing machinery can also help reduce radiant heat or lower the environmental temperatures. Install a temporary canopy over outdoor work areas or shade heavy equipment operators to lessen the sun's intensity. Use available mechanical devices to reduce physical exertion.



**Work Scheduling** - To take advantage of climatic and other environmental conditions, start jobs earlier in the morning, then space hot work throughout the day. Schedule the more strenuous or the hottest work for the coolest times of the day. Schedule more workers to reduce the work load or have them work in shifts or limit work hours within shifts to minimize exposure to high temperature and sun. Rotate work in areas where humidity may be high and air movements minimal. Postpone nonessential tasks during heat spells.

**Monitoring** - Supervisors should check environmental conditions at least hourly and monitor worker response to the heated conditions. Heat stress is a silent hazard. Workers may not realize that there is a problem until heat stress is well advanced. In wilderness environments, recognition of the gravity of the situation is important. The victim of serious heat distress must be transported as soon as possible to the nearest medical facility. In the meantime, every effort to reduce the victim's body heat load must be made.

**Educating** - Workers should be aware of the need to replace fluids, recognize dehydration and heat exhaustion, and know what to do when those conditions appear. Employers should train workers to recognize early warning signs of heat distress and take prompt, appropriate action.

Workers should know to get immediate emergency medical attention if a worker has one or more of the following symptoms:

- Mental confusion or loss of consciousness
- Flushed face, hot dry skin or no sweating.

Make sure all workers know who is trained to give first aid. Emergency phone number of ambulance, hospital, and doctors should be posted and readily accessible at all job sites.

Safety is also a concern in hot environments. Accident frequency seems to be higher in hot environments. Hot environments tend to lower mental alertness, impair judgment, and reduce physical performance. Increased body temperatures and physical discomfort in turn promotes irritability, anger, and other emotional states which may cause workers to become less aware of safety procedures.

During unusually long exposure to hot working conditions, the number of heat illnesses typically rises. Heat stress can be life threatening. The key to preventing heat related illnesses and accidents is to understand the hazards of working in hot environments, take proper precautions to safeguard health, ensure recognition of early warning signs of heat stress, and make sure workers follow recommended safe work practices.

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*This Alliant Risk Control Consulting fact sheet is not intended to be exhaustive. The discussion and best practices suggested herein should not be regarded as legal advice. Readers should pursue legal counsel or contact their insurance providers to gain more exhaustive advice.*

**For more information on this topic, please contact Alliant Risk Control Consulting at (949) 260-5042 or [riskcontrol@alliant.com](mailto:riskcontrol@alliant.com)**

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