

Information Bulletin

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Protecting Workers in Hot Environments

Many workers spend part of their working day in a hot environment. Workers in bakeries, construction projects or laundries, to name a few, often face hot working conditions which pose special hazards to health and safety.

Heat Stress Causes Body Reactions

Four environmental factors affect the amount of stress workers face in a hot work area:

- temperature
- humidity
- radiant heat (from the sun, stove or a furnace) and
- air velocity.

Perhaps most important to the level of stress an individual faces are personal characteristics such as age, weight, fitness, medical condition and the ability to acclimate to the heat. Older workers, obese workers and personnel on some types of medication are at greater risk.

The body reacts to high external temperature by circulating blood to the skin, which increases skin temperature and allows the body to give off its excess heat. However, if the muscles are being used for physical labor, less blood is available to flow to the skin and release heat.

Sweating is another method the body uses to maintain a stable internal body temperature in a heated environment. However, sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are adequately replaced.

There are many ways a person may choose to reduce the risk of heat stress, such as moving to a cooler place, reducing the work pace, loosening clothing and/or replacing fluids.

If the body cannot dissipate excess heat, it will be stored instead. When this happens the body's core temperature rises and the heart rate increases. As the body continues

to store heat, the individual will begin to lose concentration and have difficulty focusing on a task, may become irritable or sick and often loses the desire to drink. This is most often followed by fainting and then possible death if the person is not removed from the heat stress.

Heat Disorders

Heat Rash, also known as prickly heat, may occur in a hot and humid environment where sweat is not easily removed from the surface of the skin by evaporation. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a workers performance or even results in temporary total disability. It can be prevented by resting in a cool place and allowing the skin to dry.

Heat exhaustion develops as a result of loss of fluid through sweating when a worker has failed to drink enough fluids or take in enough salt or both. The worker with heat exhaustion still sweats, but experiences extreme weakness or fatigue, giddiness, nausea or headache. The skin is clammy and moist, the complexion pale or flushed and the body temperature normal or slightly higher. Treatment is usually simple: the victim should rest in cool place and drink fluids and replenish lost salt.

Heat cramps and painful spasms of the muscles are caused when workers drink large quantities of water but fail to replace their bodies' salt loss. Tired muscles - those used for performing the work - are usually the ones most susceptible to cramps. Cramps may occur during or after working hours and may be relieved by replenishing liquids by mouth.

Heatstroke, the most serious health problem for workers in hot environments is caused by the failure of the body's internal mechanism to regulate its core temperature. Heat stroke is an emergency that requires immediate medical attention.



Symptoms of Heatstroke or Sunstroke

- Headache, nausea, dizziness
- Red, dry, very hot skin (sweating has ceased)
- Pulse strong and rapid
- Small Pupils
- Very high fever
- May become very disoriented
- Unconsciousness and possible convulsions

First Aid for Heatstroke or Sunstroke

- Remove victim to a cooler location, out of the sun
- Loosen or remove clothing and immerse victim in very cool water if possible
- If immersion isn't possible, cool victim with water or wrap in wet sheets and fan for quick evaporation
- Use cold compresses-especially to the head and neck area, also the armpits and groin
- Seek medical attention immediately

Preventing Heat Stress

Following a few basic precautions should lessen heat stress.

- Acclimation to the heat through short exposures followed by longer period of work in the hot environment can reduce heat stress. New employees and workers returning from an absence of two weeks or more should have a 5-day period of acclimation.
- This period should begin with 50 percent of the normal workload and time exposure the first day and gradually building up to 100 percent on the fifth day.

- A variety of engineering controls including general ventilation and spot cooling by local exhaust ventilation at points of high heat production may be helpful. Shielding is required as protection from radiant heat sources. Evaporative cooling and mechanical refrigeration or cooling fans can also reduce heat in hot conditions. Eliminating steam leaks will also help.

- Provide plenty of drinking water - as much as a quart per worker per hour - available at the workplace can help reduce the risk of heat disorders. Training first aid workers to recognize and treat heat stress disorders and making the names of trained staff known to all workers is essential. Employers should also consider individual workers' physical condition when determining their fitness for working in hot environments.

- Alternating work and rest periods with longer rest periods in a cool area can help workers avoid heat strain. If possible heavy work should be scheduled during the cooler parts of the day and appropriate protective clothing provided. Supervisors should be trained to detect early signs of heat strain and should permit workers to interrupt their work if they are extremely uncomfortable.

- Employee education is vital so that workers are aware of the need to replace fluids and salt lost through sweat and can recognize dehydration, exhaustion, fainting, heat cramps, salt deficiency, heat exhaustion and heatstroke as heat disorders. Workers should also be informed of the importance of daily weighing before and after work to avoid dehydration.