OSHA

Occupational Safety
and Health Administration

Outdoor and Indoor Health-Related Hazards National Emphasis Program

National Emphasis Program Goal

Reduce or eliminate worker exposures to heat-related hazards that result in illnesses, injuries, and deaths, by targeting industries and worksites, including worksites with radiant heat sources, where employees are exposed to heat-related hazards and have not been provided adequate protection that includes cool water, rest, cool areas, training, and acclimatization. To achieve swift abatement to prevent heat-related injuries and deaths.

OSHA enforces workplace protections related to heat illness using the General Duty Clause 5(a)(1).

(a)Each employer --

(1)shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

Other OSHA standards that may be applicable include the use of Personal Protective Equipment, medical services and first aid and:

- Recordkeeping 1904.7(b)(5)

  Unconscious, the use of Oxygen both must be recorded

- Sanitation Standards 1910.141, 1926.51

  Cool potable water

- General Construction Training & Education 1926.20 and 1926.21

Engineering Controls

The best engineering controls to prevent heat-related illness is to make the work environment cooler and to reduce manual workload with mechanization. A variety of engineering controls can reduce workers' exposure to heat:

- Air conditioning (such as air-conditioned crane or construction equipment cabs, air conditioning in break rooms)
- Increased general ventilation
- Cooling fans
- Local exhaust ventilation at points of high heat production or moisture (such as exhaust hoods in laundry rooms)
- Reflective shields to redirect radiant heat
- Insulation of hot surfaces (such as furnace walls)
- Elimination of steam leaks
- Cooled seats or benches for rest breaks
- Use of mechanical equipment to reduce manual work (such as conveyors and forklifts).
- Misting fans that produce a spray of fine water droplets

Administrative Controls

Some worksites cannot be cooled by engineering controls. At those locations, employers should modify work practices when heat stress is too high to work safely. Consider the following activity modifications:

- Modify work schedules and activities for workers who are new to warm environments.
- Schedule shorter shifts for newly hired workers and unacclimatized existing workers. Gradually increase shift length over the first 1-2 weeks.
- Require mandatory rest breaks in a cooler environment (such as a shady location or an air conditioned building). The duration of the rest breaks should increase as heat stress rises. See the Hazard Recognition section for more information.
- Consider scheduling work at a cooler time of day, such as early morning or late afternoon.
- Reduce physical demands as much as possible by planning the work to minimize manual effort (such as delivering material to the point of use so that manual handling is minimized).

Administrative Controls

- Rotate job functions among workers to help minimize exertion and heat exposure.
- Ensure that workers drink an adequate amount of water or electrolyte-containing fluids.
- Employers should have an emergency plan that specifies what to do if a worker has signs of heat-related illness, and ensures that medical services are available if needed.
- Workers should watch out for each other for symptoms of heat-related illness prepared to administer appropriate first aid to anyone who is developing a heat-related illness.
- Administer appropriate first aid [hyperlink to first aid page] to any worker who is developing a heat-related illness.
- In some situations, employers may need to conduct physiological monitoring of workers.
- Implement a buddy system for new workers and in heat stress environments.
- Avoid drinking hot beverages during lunch and afternoon breaks.

Personal Protective Equipment

In most cases, heat stress should be reduced by engineering controls or work practice modifications. However, in some limited situations, special cooling devices can protect workers in hot environments:

- Insulated suits
- Reflective clothing
- Infrared reflecting face shields
- Cooling neck wraps

In extremely hot conditions, the following thermally conditioned clothing might be used:

- Vest that receives cooled air from a vortex tube connected to an external compressed air source.
- Jackets or vests with reusable ice packs or phase change cooling packs in the pockets.
- Workers should be aware that use of certain personal protective equipment (e.g., certain types of respirators, impermeable clothing, and head coverings) can increase the risk of heat-related illness.

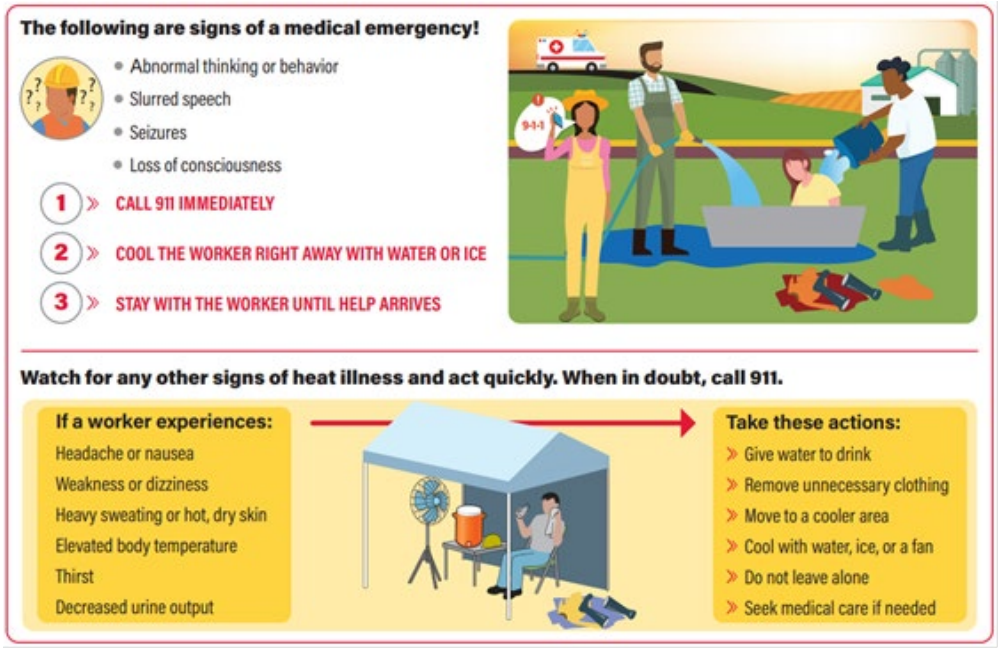
Heat Related Resources available to all:

OSHA-NIOSH

Heat Safety Tool App

This App provides current and projected heat indices for that day at the current location

The App indicates the hazard levels as: Caution (less than 80 ° F HI), Warning (80 ° F – 94 ° F-HI), Danger (95 ° F Hi or higher), and offers recommended actions to protect workers.



OSHA Educational Resources:

Fact Sheets/Posters/Brochures

some publications are now translated in over 10 languages

OSHA Webpages:

Heat Illness Prevention Campaign Webpage – Heat Illness Prevention

UNITED STATES
DEPARTMENT OF LABOR

Occupational Safety and Health Administration

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Home / Heat Illness Prevention Campaign

Heat Illness Prevention

Heat | General Education | Employer's Responsibility | Worker Information | National Heat Contest

Every year, dozens of workers die and thousands more become ill while working in hot or humid conditions. The OSHA Heat Illness Prevention campaign educates employers and workers on the dangers of working in the heat.

Heat Illness General Education

Heat illness is serious, but you can prevent it.

Learn More

Employer's Responsibility

Employers can keep workers safe in the heat.

Learn More

Worker Information

Understand workers' rights and what workers should know about heat illness.

Learn More

Featured Resources

National Heat Contest Information Session – May 16

Hydration: Urine Color Chart (ZIP) • Español (ZIP)

Heat Illness: Prevent Heat Illness at Work Poster (PDF) • Español (PDF)

Sun Safety at Work Infographic English (ZIP)

See all OSHA publications about Heat

Join our mailing list

By subscribing, you will receive our newsletter on heat illness prevention, The Heat Source.

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Safety and Health Topics Webpage – Occupational Heat Exposure

Overview: Working in Outdoor and Indoor Heat Environments

Millions of U.S. workers are exposed to heat in their workplaces. Although illness from exposure to heat is preventable, every year, thousands become sick from occupational heat exposure, and some cases are fatal. **Most outdoor fatalities, 50% to 70%, occur in the first few days of working in warm or hot environments because the body needs to build a tolerance to the heat gradually over time. The process of building tolerance is called heat acclimatization. Lack of acclimatization represents a major risk factor for fatal outcomes.**

Occupational risk factors for heat illness include heavy physical activity, warm or hot environmental conditions, lack of acclimatization, and wearing clothing that holds in body heat. (See also, personal risk factors, below.)

Hazardous heat exposure can occur indoors or outdoors, and can occur during any season if the conditions are right, not only during heat waves. The following is a list of some industries where workers have suffered heat-related illnesses.

Outdoors	Indoors
Agriculture	Bakeries, kitchens, and laundries (sources with indoor heat-generating appliances)
Construction – especially, road, roofing, and other outdoor work	Electrical utilities (particularly boiler rooms)
Construction – roofing work	Fire Service
Landscaping	Iron and steel mills and foundries
Mail and package delivery	Manufacturing with hot local heat sources, like furnaces (e.g., paper products or concrete)
Oil and gas well operations	Warehousing

Highlights

- National Emphasis Program – Outdoor and Indoor Heat-Related Hazards. OSHA Directive CPL 03-00-024, (April 8, 2022). NEW
- OSHA Publishes Advance Notice of Proposed Rulemaking for Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings. OSHA, (October 27, 2021).
- COVID-19 Guidance on the Use of Cloth Face Coverings while Working Outdoors in Hot and Humid Conditions. OSHA, (September 2020).
- COVID-19 Guidance on the Use of Cloth Face Coverings while Working Indoors in Hot and Humid Conditions. OSHA, (September 2020).

OSHA-NIOSH Infosheet – Protecting Workers from Heat Illness

OSHA·NIOSH INFOSHEET

Protecting Workers from Heat Illness

At times, workers may be required to work in hot environments for long periods. When the human body is unable to maintain a normal temperature, heat-related illnesses can occur and may result in death. This fact sheet provides information to employers on measures they should take to prevent heat-related illnesses and death.

Factors That Increase Risk to Workers

- High temperature and humidity
- Direct sun exposure (with no shade)
- Indoor exposure to other sources of radiant heat (ovens, furnaces)
- Limited air movement (no breeze)
- Low fluid consumption
- Physical exertion
- Heavy personal protective clothing and equipment
- Poor physical condition or health problems
- Some medications, for example, different kinds of blood pressure pills or antihistamines
- Pregnancy
- Lack of recent exposure to hot working conditions
- Previous heat-related illness
- Advanced age (65+)

Health Problems Caused by Hot Environments

Heat Stroke is the most serious heat-related health problem. Heat stroke occurs when the body's temperature regulating system fails and body temperature rises to critical levels. **Heat stroke is a medical emergency that may rapidly result in death!**

Symptoms of heat stroke include:

- Confusion
- Loss of consciousness
- Seizures
- Very high body temperature
- Hot, dry skin or profuse sweating

If a worker shows signs of possible heat stroke:

- **Heat stroke is a life-threatening emergency! While first aid measures are being implemented, call 911 and get emergency medical help.**
- **Make sure that someone stays with the worker until help arrives.**
- Move the worker to a shaded, cool area and remove outer clothing.
- Wet the worker with cool water and circulate the air to speed cooling.
- Place cold wet cloths or ice all over the body or soak the worker's clothing with cold water.

Heat Exhaustion is the next most serious heat-related health problem.

Symptoms of heat exhaustion:

- Headache
- Nausea
- Dizziness
- Weakness
- Irritability
- Thirst
- Heavy sweating
- Elevated body temperature
- Decreased urine output

If a worker shows signs of possible heat exhaustion:

- Workers with signs or symptoms of heat exhaustion should be taken to a clinic or emergency room for medical evaluation and treatment.
- If medical care is not available, **call 911 immediately.**
- Make sure that someone stays with the worker until help arrives.
- Workers should be removed from the hot area and given liquids to drink.
- Remove unnecessary clothing including shoes and socks.
- Cool the worker with cold compresses to the head, neck, and face or have the worker wash his or her head, face and neck with cold water.
- Encourage frequent sips of cool water. If the worker is unable to drink, get emergency medical help immediately.

Heat Cramps are muscle pains usually caused by physical labor in a hot work environment. Heat cramps are caused by the loss of body salts and fluid during sweating.

If a worker shows signs of possible heat cramps:

- Workers should replace fluid loss by drinking water and having a snack, and/or carbohydrate-electrolyte replacement liquids (e.g., sports drinks) every 15 to 20 minutes.
- Workers should avoid salt tablets.
- Get medical help if the worker has heart problems, is on a low sodium diet, or if cramps do not subside within one hour.

Heat Rash is the most common problem in hot work environments. Heat rash is caused by sweating and looks like a red cluster of pimples or small blisters. Heat rash usually appears on the neck, upper chest, in the groin, under the breasts and in elbow creases.

If a worker shows signs of possible heat rash:

- The best treatment for heat rash is to provide a cooler, less humid work environment.
- The rash area should be kept dry.
- Powder may be applied to increase comfort.
- Ointments and creams should not be used on a heat rash. Anything that makes the skin warm or moist may make the rash worse.

Preventing Heat Illness

The best way to prevent heat illness is to make the work environment cooler.

Recommendations for All Work Environments (Indoors and Outdoors):

- Train workers and supervisors about the hazards leading to heat illness and ways to prevent them.
- Train workers to recognize symptoms in themselves and others.
- Train and encourage workers to immediately report symptoms in themselves and others.
- If you have someone who is new to the job or who has been away for more than a week, gradually increase the workload or allow more frequent breaks the first week.
- Provide workers with plenty of cool water in convenient, visible locations close to the work area. Water should have a palatable (pleasant and odor-free) taste and water temperature should be 50-60°F if possible.
- Remind workers to frequently drink small amounts of water before they become thirsty to maintain good hydration. Simply telling them to drink plenty of fluids is not sufficient. During moderate activity, in moderately hot conditions, workers should drink about 1 cup every 15 to 20 minutes. Instruct workers that urine should be clear or lightly colored.
- Workers should eat regular meals and snacks as they provide enough salt and electrolytes to replace those lost through sweating as long as enough water is consumed. Electrolyte drinks (e.g. Gatorade®) are usually not necessary.
- Set up a buddy system if possible; if not, check routinely (several times an hour) to make sure workers are making use of water and shade and not experiencing heat-related symptoms.
- Make workers aware that it is harmful to drink extreme amounts of water. Workers should generally not drink more than 12 quarts (48 cups) in a 24 hour period. If higher amounts of fluid replacement are needed due to prolonged work in high heat conditions, a more comprehensive heat illness prevention program may be warranted.
- Reduce the physical demands of the job. If heavy job tasks cannot be avoided, change work/rest cycles to increase the amount of rest time.
- Schedule frequent rest periods with water breaks in shaded or air-conditioned recovery areas. Note that air conditioning will NOT result in loss of heat tolerance and is recommended for rest breaks.

Additional Recommendations for Outdoor Work Environments

- Monitor weather reports daily and reschedule jobs with high heat exposure to cooler times of the day. Be extra vigilant during heat waves when air temperatures rise above normal. When possible, routine maintenance and repair projects should be scheduled for the cooler seasons of the year.

Additional Recommendations for Indoor Work Environments

- Indoor workplaces may be cooled by using air conditioning or increased ventilation, if cooler air is available from the outside.
- Other methods to reduce indoor temperature include providing reflective shields to redirect radiant heat, insulating hot surfaces, and decreasing water vapor pressure, e.g., by sealing steam leaks and keeping floors dry.
- The use of fans to increase the air speed over the worker will improve heat exchange between the skin surface and the air, unless the air temperature is higher than the skin temperature.
- Reflective clothing, such as safety vests, worn as loosely as possible, can minimize heat illness. Water-dampened cotton whole-body suits are an inexpensive and effective personal cooling technique. Cooling vests with pockets that hold cold packs are comfortable and effective.
- More complex and expensive water-cooled suits are also available; however, these may require a battery-driven circulating pump and liquid coolant.
- In worksites where high ambient temperatures typically occur (e.g., foundries, steel mills), professional consultation should be sought to evaluate the extent of the heat exposure and to make recommendations on how to prevent heat-related illnesses.

Resources

For more information about protecting workers from heat-related illnesses visit:

- OSHA online at: www.osha.gov/SLTC/heatstress/index.html and www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html
- NIOSH online at: http://www.cdc.gov/niosh/topics/heatstress/
- Cal/OSHA's Heat Safety program at: www.99calor.org/english.html

OSHA Publications

OSHA has an extensive publications program. For a listing of free items, visit OSHA's web site at www.osha.gov/publications or contact the OSHA Publications Office, U.S. Department of Labor, 200 Constitution Avenue, N.W., N-3101, Washington, DC 20210. Telephone (202) 693-1888 or fax to (202) 693-2498.

Contacting OSHA

To report an emergency, file a complaint or seek OSHA advice, assistance or products, call (800) 321-OSHA (6742) or contact your nearest OSHA regional, area, or State Plan office; TTY: 1-877-889-5627.

Contacting NIOSH

To receive documents or more information about occupational safety and health topics, please contact NIOSH: 1-800-CDC-INFO (1-800-232-4636); TYY: 1-888-232-6348; e-mail: cdcinfo@cdc.gov or visit the NIOSH web site at www.cdc.gov/niosh.

For more complete information:

U.S. Department of Labor
Hilda L. Solis, Secretary of Labor

OSHA® Occupational Safety and Health Administration
www.osha.gov
(800) 321-OSHA

CDC Workplace Safety and Health

NIOSH
www.cdc.gov/niosh
(800) 232-4636

DHHS (NIOSH) 2011-174 OSHA 3439-11

NIOSH Criteria Document – Criteria for a Recommended Standard:

Occupational Exposure to Heat and Hot Environments

The National Institute for Occupational Safety and Health (NIOSH)

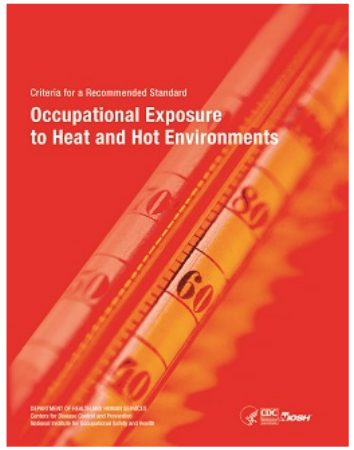
NIOSH Publications & Products > NIOSH-Issued Publications

Promoting productive workplaces through safety and health research NIOSH

Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments

Print

DHHS (NIOSH) PUBLICATION NUMBER 2016-106 FEBRUARY 2016



Occupational exposure to heat can result in injuries, disease, reduced productivity, and death. To address this hazard, the National Institute for Occupational Safety and Health (NIOSH) has evaluated the scientific data on heat stress and hot environments and has updated the *Criteria for a Recommended Standard: Occupational Exposure to Hot Environments*. This document was last updated in 1986, and in recent years, including during the Deepwater Horizon oil spill response of 2010, questions were raised regarding the need for revision to reflect recent research and findings. This revision includes additional information about the physiological changes that result from heat stress; updated information from relevant studies, such as those on caffeine use; evidence to redefine heat stroke and associated symptoms; and updated information on physiological monitoring and personal protective equipment and clothing that can be used to control heat stress.

Occupational Exposure to Heat and Hot Environments [PDF – 3.6 MB]

- Other NIOSH Resources: Heat Stress

Think Safety and Work Safely so all our employees can go home and enjoy their friends, families & life.