

For Their Safety

International Board of Environmental Health & Safety

“Instilling Professionalism”

Jul – Aug - Sep 2019 Volume 17, Issue 3



- Working in Outdoor and Indoor Heat Environments
- First Aid for Heat-Related Injuries
- Anxiety in the Workplace

Working in Outdoor and Indoor Heat Environments

OSHA

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.

Indoor workplaces with hot conditions may include iron and steel foundries, brick-firing and ceramic plants, glass products facilities, electrical utilities (particularly boiler rooms), bakeries, commercial kitchens, laundries, chemical plants, material handling and distribution warehouses, and many other environments.

Outdoor workplaces with work in hot weather and direct sun, such as farm work, construction, oil and gas well operations, landscaping, emergency response operations, and hazardous waste site activities, also increase the risk of heat-related illness in exposed workers.

Every year, many workers become sick from occupational heat exposure, and some are fatally injured. These illnesses and fatalities are preventable.

Why Is Heat a Hazard to Workers?

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 and even death if the person is not cooled down.

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.

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.

Who Could be Affected by Heat?

Workers exposed to hot indoor environments or hot and humid conditions outdoors are at risk of heat-related illness, especially those doing heavy work tasks or using bulky or non-breathable protective clothing and equipment. Some workers might be at greater risk than others if they have not built up a tolerance to hot conditions, or if they have certain health conditions. The table below shows some environmental and job-specific factors that increase the risk of heat-related illness.

Factors that put workers at greater risk:

Environmental

- High temperature and humidity
- Radiant heat sources
- Contact with hot objects
- Direct sun exposure without shade
- Limited air movement

Job Specific

- Physical exertion
- Non-breathable personal protective equipment

Workers who are suddenly exposed to working in a hot environment face additional, but generally avoidable hazards to their safety and health. New workers and those returning from time away are especially vulnerable. That's why it is important to prepare for the heat: educate workers about the dangers of heat, and acclimatize workers by gradually increasing the workload or providing more frequent breaks to help new workers and those returning to a job after time away build up a tolerance for hot conditions.

How Do I Know If It's Too Hot?

Heat Index	Risk Level	Protective Measures
Less than 91°F (33°C)	Lower (caution)	Basic heat safety and planning
91°F to 103°F (33°C to 40°C)	Moderate	Implement precautions and heighten awareness
103°F to 115°F (40°C to 46°C)	High	Additional precautions to protect workers
Greater than 115°F (46°C)	Very High to Extreme	Triggers even more aggressive protective measures

- The temperature rises
- Humidity increases
- The sun gets stronger
- There is no air movement
- No controls are in place to reduce the impacts of equipment that radiates heat
- Protective clothing or gear is worn
- Work is strenuous

The heat index, which takes both temperature and humidity into account, is a useful tool for outdoor workers and employers (see Using the Heat Index: A Guide for Employers).

How Can Heat-Related Illness be Prevented?

Heat-related illnesses can be prevented. Important ways to reduce heat exposure and the risk of heat-related illness include engineering controls, such as air conditioning and ventilation, that make the work environment cooler, and work practices such as work/rest cycles, drinking water often, and providing an opportunity for workers to build up a level of tolerance to working in the heat. Employers should include these prevention steps in worksite training and plans. Also, it's important to know and look out for the symptoms of heat-related illness in yourself and others during hot weather. Plan for an emergency and know what to do — acting quickly can save lives!

Prevention

Most heat-related health problems can be prevented, or the risk of developing them can be reduced. For indoor environments, refer to the information below.

Engineering Controls

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

- Air conditioning.
- Increased general ventilation.
- Cooling fans.
- Local exhaust ventilation at points of high heat production or moisture.
- Reflective shields to redirect radiant heat.
- Insulation of hot surfaces (such as furnace walls).

Work Practices

- Employers should have an emergency plan in place that specifies what to do if a worker has signs of heat-related illness, and ensures that medical services are available if needed.
- Employers should take steps that help workers become acclimatized (gradually build up exposure to heat), especially workers who are new to working in the heat or have been away from work for a week or more.
- Workers must have adequate potable (safe for drinking) water close to the work area, and should drink small amounts frequently.
- Rather than being exposed to heat for extended periods of time, workers should, wherever possible, be permitted to 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.
- Rotating job functions among workers can help minimize overexertion and heat exposure.
- Workers should watch out for each other for symptoms of heat-related illness and take action if need.

Personal Protective Equipment

Workers should be aware that use of certain personal protective equipment (e.g., certain types of respirators and impermeable clothing) can increase the risk of heat-related illness. In some situations, special cooling devices can protect workers in hot environments:

- In some workplaces, insulated gloves, insulated suits, reflective clothing, or infrared reflecting face shields may be needed.
- Thermally conditioned clothing might be used for extremely hot conditions; for example:
 - A garment with a self-contained air conditioner in a backpack.
 - A garment with a compressed air source that feeds cool air through a vortex tube.
 - A plastic jacket whose pockets can be filled with dry ice or containers of ice.

Training

Workers and supervisors should be trained about the hazards of heat exposure and their prevention. T

- Risk factors for heat-related illness.
- Different types of heat-related illness, including how to recognize common signs and symptoms.
- Heat-related illness prevention procedures.
- Importance of drinking small quantities of water often.
- Importance of acclimatization, how it is developed, and how your worksite procedures address it.
- Importance of immediately reporting signs or symptoms of heat-related illness to the supervisor.
- Procedures for responding to possible heat-related illness.
- Procedures to follow when contacting emergency medical services.
- Procedures to ensure that clear and precise directions to the work site will be provided to emergency medical services.

First Aid for Heat-Related Emergencies

Healthline

Heat emergencies are health crises caused by exposure to hot weather and sun. Heat emergencies have three stages: heat cramps, heat exhaustion, and heatstroke. All three stages of heat emergency are serious.

Signs and Symptoms of Heat-Related Emergency

Heat Cramp - the first stage of heat emergency; usually happen when you've been physically active in the heat, but they can also occur if you haven't been active - heat cramps are especially likely in the elderly or small children, overweight people, and people who have been drinking alcohol. Muscle pain and tightness are symptoms of heat cramps.

Heat Exhaustion – symptoms may include:

- muscle cramps
- dizziness
- mild confusion
- fast heart rate or breathing
- headache
- irritability
- extreme thirst
- nausea or vomiting
- pale skin
- heavy sweating
- fainting

Heat Stroke - all the symptoms of heat exhaustion may be present, plus:

- body temperature over 104°F
- irrational behavior or hallucinations
- confusion
- rapid, shallow breathing
- rapid, weak pulse
- seizures
- loss of consciousness
- dry skin

Rendering Aid to Heat-Related Illness

Heat Cramps

- Move to a cooler area, out of direct sunlight.
- Gently massage the cramping muscle.
- Stretch the muscle gently.
- Drink cool water or sports drinks every 15 minutes.

Heat Exhaustion

- Move to a cooler area, out of direct sunlight.
- Loosen clothing.
- Apply cool, wet towels to your face, neck, chest, and limbs.
- Have someone fan your skin.
- Drink cool water or sports drinks every 15 minutes.
- Don't drink too quickly.

Heat Stroke – this is a life-threatening emergency and medical attention should be summons immediately

- Move the person to a cooler area, out of direct sunlight.
- Loosen clothing.
- Remove any sweaty clothing.
- Apply cool, wet towels to the face, neck, chest, and limbs.
- Apply ice, if you have it, to the underarms, wrists, and groin.
- Fan the person's skin.
- Offer cool water or sports drinks every 15 minutes if the person is conscious.

Quotes:

"*The safety of the people shall be the highest law.*" – Marcus Tullius Cicero, Roman philosopher born in 106 BC

Anxiety in the Workplace

Anxiety & Depression Assn of America

It comes as no surprise that most working Americans experience stress or anxiety in their daily lives. And the Anxiety Disorders Association of America (ADAA) 2006 Stress & Anxiety Disorders Survey backs that up.

A certain amount of stress and anxiety is normal at work as well as at home. However, persistent, excessive, and irrational anxiety that interferes with everyday functioning is often an indication of an anxiety disorder.

Survey Findings

Frequency of stress in the workplace (self-reporting of anxiety symptoms and prescription medication use is high, but diagnoses of anxiety disorders are dramatically low)

- 72 percent of people who have daily stress and anxiety say it interferes with their lives at least moderately.
- 40 percent experience persistent stress or excessive anxiety in their daily lives.
- 30 percent with daily stress have taken prescription medication to manage stress, nervousness, emotional problems or lack of sleep.
- 28 percent have had an anxiety or panic attack.
- Only 9 percent have been diagnosed with an anxiety disorder.

Other key findings

- *On the job* – employees comment that stress has an impact on:
 - workplace performance (56 percent)
 - relationship with coworkers and peers (51 percent)
 - quality of work (50 percent)
 - relationships with superiors (43 percent)
- *Off-time* – more than three-fourths who say stress interferes with their work say it carries over to their personal life, particularly men (83 percent vs. 72 percent for women).
- *Significant other* – seven in 10 of these adults report that workplace stress affects their personal relationships, mainly with their spouses. Men (79 percent) report it affecting personal relationships more than women (61 percent).
- *Main culprits* – work related stress
 - deadlines (55 percent)
 - interpersonal relationships (53 percent)
 - staff management (50 percent)
 - dealing with issues/problems that arise (49 percent)
- *Sleep* – number one method of managing high levels of stress
- *Women / Men* – managing job stress differently
 - Women are significantly more likely than men to eat more (46 percent vs. 27 percent) and talk to family and friends (44 percent vs. 21 percent) to manage job stress.
 - Men are significantly more likely than women to have sex more frequently (19 percent vs. 10 percent) and use illicit drugs (12 percent vs. 2 percent) to manage job stress.
- *Common ways men / women cope:*
 - consuming more caffeine (31 percent)
 - smoking (27 percent)
 - exercising more frequently (25 percent)
 - taking over-the-counter or prescription medication (23 percent)
 - consuming more alcoholic beverages (20 percent)

- *Tight-lipped* – fewer than half (40 percent) employees whose stress interferes with work have talked to their employer about it. Why:
 - fear their boss would interpret it as lack of interest or unwillingness to do the activity (34 percent)
 - fear being labeled “weak” (31 percent)
 - fear it would affect promotion opportunities (22 percent)
 - fear it would go in their file (22 percent)
 - fear being laughed at or not taken seriously (20 percent)
- *Fear of stigma* – only one-fourth of those with an anxiety disorder have told their employers. The three-fourths who have not feared...
 - their boss would interpret it as lack of interest of unwillingness to do the activity (38 percent).
 - it would affect promotion opportunities (34 percent).
 - it would go in their file (31 percent).
- *Symptom triggers* – half said their work responsibilities trigger symptoms of their disorder (53 percent), primarily dealing with problems and meeting deadlines. Interpersonal relationships also trigger symptoms (46 percent), as do changes to work situations (37 percent) — such as leaving a job, starting a new one, or getting fired — and staff management (35 percent).
- *Coping* – employees with anxiety disorders ease their symptoms in a variety of ways, primarily...
 - taking over-the-counter or prescription medication (52 percent)
 - sleeping more (50 percent)
 - eating more (39 percent)
 - talking to family or friends (38 percent)
 - talking to a medical or mental health professional (37 percent)

OSHA

NOAA

OSHA has partnered with the National Oceanic and Atmospheric Administration (NOAA) on weather service alerts. NOAA's alerts are based on a "heat index" that indicates how hot it really feels when relative humidity is factored with the actual air temperature. This information can help workers and employers take precautions in a timely way to prevent heat-related illness.

Measuring Temperature

Wet Bulb Globe Temperature (WBGT) is the most accurate tool to measure heat hazards for outdoor workers. It takes temperature, humidity, wind speed, and radiant heat into account. The OSHA Technical Manual Heat Stress Chapter provides WBGT information and calculations, and the National Weather Service provides a prototype WBGT location tool and work/rest recommendations.

EPA

2019 Marks 25 Years of the UV Index, Yet Skin Cancer Remains the Most Common Cancer in the USA. “Given the prevalence of skin cancer, we want to remind all Americans to be smart in the sun this holiday weekend and throughout the year,” said Bill Wehrum, assistant administrator for EPA’s Office of Air and Radiation. “The UV Index helps Americans prevent overexposure to UV radiation while we enjoy the outdoors.” To download the app, search for EPA’s UV Index in the iTunes App Store and on Google Play.

CDC

Food Safety at Fairs and Festivals - One of the biggest draws to these events is the many different types of foods and drinks available. To be safe look for:

- Vendors that have a clean and tidy workstation
- Vendors that have sinks for employees to wash their hands
- Employees wearing disposable gloves
- Refrigeration for raw foods
- Inspection stickers