

SAFETY & LOSS PREVENTION

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OUTLOOK

STAYING COOL
WHEN TEMPERATURES RISE



Protecting Employees from the Occupational Hazards of Extreme Heat



STAYING COOL WHEN TEMPERATURES RISE

While many people look forward to summer weather, the climbing thermometer can put those who work in Florida's sweltering heat at risk.

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EXTREME HEAT

Between May 1 and September 30, 2018, outdoor workers in every Florida county were exposed to dangerous levels of heat for at least one hour on 71% of the days they worked, and in some counties, as many as 99% of workdays, according to the National Institute for Occupational Safety and Health (NIOSH).

WHAT IS EXTREME HEAT?

For most of the United States, temperatures above 90° with high humidity constitute extreme heat, according to the Department of Homeland Security. Here in Florida, we are frequently faced with such outdoor conditions. In May of this year, parts of Florida saw temperatures reaching nearly 100°, much earlier than usual for such temperatures.

Total heat stress is the sum of metabolic heat (the heat generated by the body) and environmental heat (the heat gained from the environment), minus the heat lost from the body to the environment. The body reacts to metabolic and environmental heat by transferring heat back to the environment through processes such as sweating, in an attempt to maintain core body temperature. At high levels of heat stress, the body is no longer capable of maintaining the body's temperature needed for normal body functions, and the risks of heat-related hazards increases. Total heat exposure to workers should be regulated by employers based on the health and acclimatization of each individual worker.

Because outdoor labor adds to the risk of heat stress, NIOSH has issued recommended temperature limits over which workers should be protected from heat (see the chart). The heavier the labor, the lower the temperature limit.

WHAT ARE THE DANGERS OF WORKING IN EXTREME HEAT?

Increased risk of accidents

A recent study by the Barcelona Institute for Global Health indicates that extreme temperatures may increase the risk of occupational accidents as much as 9%, which puts Florida's workers, especially those who work outdoors, at a high risk of injury. Surprisingly, bone fractures accounted for the most injuries. This is not only due to hazards such as sweaty palms and fogged-up glasses, but also the cumulative impacts of fatigue and dehydration, which can cause dizziness and reduce brain function responsible for reasoning.

Heat Related Illnesses

When a person is exposed to extremely hot temperatures, the body works to maintain a

| SAFE TEMPERATURE LIMITS | |
|---|--------|
| RESTING (sitting) | 90°F |
| LIGHT LABOR (sitting, standing, light arm work, occasional walking) | 87°F |
| MODERATE LABOR (normal walking, moderate lifting) | 82.4°F |
| HEAVY LABOR (handling heavy materials, walking quickly) | 78.8°F |
| VERY HEAVY LABOR (pick & shovel work) | 77°F |

constant inner temperature by pumping more blood to the surface of the skin and increasing sweat production, thus reducing the flow of blood to the brain, muscles, and organs. This can result in several illnesses.

HEAT RASH

Also known as “prickly heat,” clusters of red bumps form on the skin caused by irritation from sweat that does not evaporate. This is the most common problem in hot work environments. **First Aid:** Have the worker keep the affected area dry, and move to a cooler, less humid work environment, if possible.

HEAT CRAMPS

These are painful muscle spasms, usually in the abdomen, arms, or legs, caused by the loss of body fluid and salts during sweating. Cramps may occur during or after working, and the most tired muscles are typically the most affected. **First Aid:** Have the worker rest in a shady, cool area and drink lots of fluids. Beverages that help replenish electrolytes can help. Wait a few hours before allowing worker to return to strenuous work.

HEAT EXHAUSTION

Like heat cramps, heat exhaustion is also caused

by the loss of water and salts during sweating, but symptoms are more severe and can include headache, nausea, dizziness, weakness, muscle cramps, extreme thirst, and an accelerated heart rate. **First Aid:** Worker should rest in a shady, cool area and drink fluids. Loosen and remove as much outer clothing as possible and cool the skin with cold compresses or ice packs. If symptoms do not improve within an hour, the worker should go to the emergency room.

RHABDOMYOLYSIS

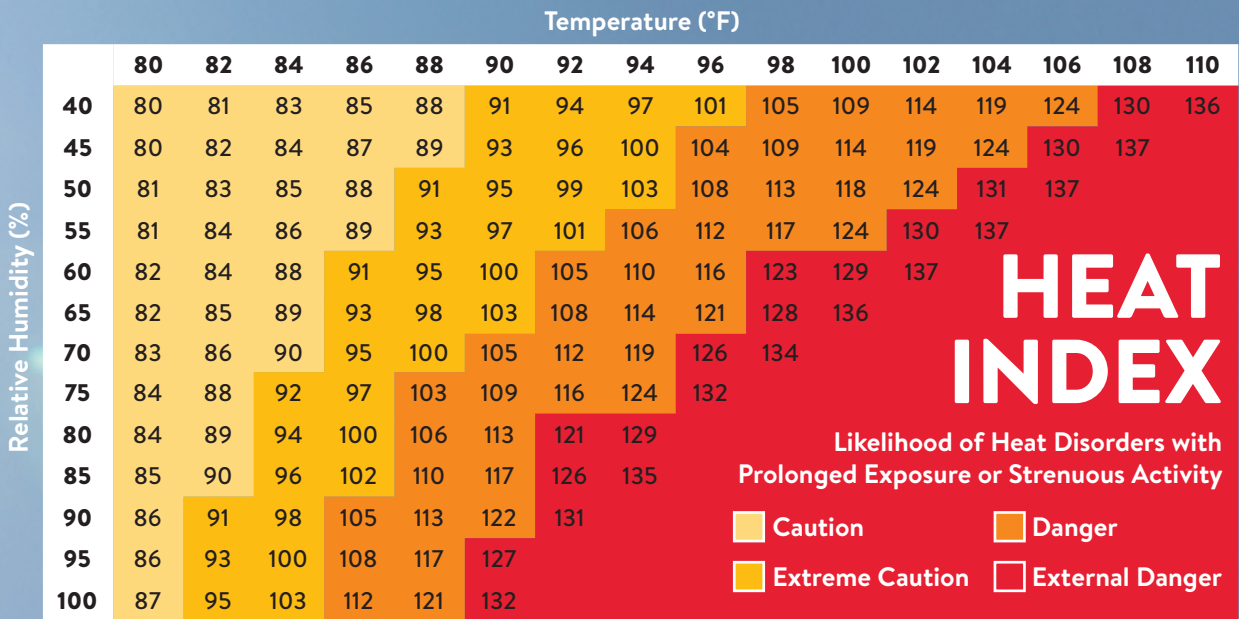
This serious medical condition occurs when workers are subjected to prolonged physical exertion and heat stress, causing the breakdown of muscle tissue. This releases proteins into the bloodstream that can cause irregular heartbeat, seizures, and kidney damage. Symptoms are not always apparent, but muscle cramps and weakness, exercise intolerance, and abnormally dark urine can be signs. **First Aid:** Worker should stop working and drink water, then seek medical care.

HEAT STROKE

Heat stroke occurs when the body is no longer able to regulate its temperature through sweating. This is a medical emergency that can result in death if not treated. **Call 911 immediately** if the worker shows symptoms such as throbbing headache, confusion, fainting, vomiting, seizures, or a very high body temperature. Often a person suffering heat stroke is no longer capable of sweating, so their skin will be dry and red hot. **First Aid: Call 911.** Next, place the worker in a shady, cool area. Loosen and remove as much outer clothing as possible, or drench clothing with cool water. Cool the body with fans, cool water, or ice packs, and place cold wet cloths on the head, neck, armpits, and groin. Stay with the worker until help arrives.

WHAT IS THE HEAT INDEX?

This is a measure of environmental heat stress that combines air temperature and humidity to calculate the “apparent temperature” (what the air feels like). Humid air increases the heat index, making the air feel warmer than it is. The higher



the heat index, the more difficult for the body to cool itself.

WHO IS AT RISK?

It isn't just outdoor workers at risk for occupational illnesses and injuries caused by heat stress. Anyone who is subjected to high temperatures and humidity, direct sun exposure, indoor radiant heat sources, and/or limited air movement is at risk. This includes bakery and factory workers, construction workers, and firefighters. Other factors, such as physical conditions like lung disease, stimulant medications (including caffeine use), pregnancy, advanced age, or having previously experienced a heat-related illness can also increase this risk. Personal protective equipment (PPE) can add to the problem. (This does not mean workers should forego PPE use in extreme heat – just take into account the added risk of heat stress.)

HOW CAN HEAT RELATED ILLNESSES BE PREVENTED?

Employers should provide heat stress training

to workers prior to working in hot environments. This should include information about heat-related illnesses, how to recognize and report symptoms, the importance of proper hydration and acclimatization, proper use of heat-protective clothing and equipment, the effects of various factors such as medications and personal protective equipment on heat tolerance.

Employers can use engineering controls to modify the causes of heat stress on the work environment, such as:

- Increasing ventilation and bringing in cooler outside air (opening windows, using fans, etc.)
- Using air conditioning equipment to lower temperatures and humidity
- Reducing radiant heat source temperatures and sources
- Shielding workers with heat-absorbing or heat-reflecting barriers
- Providing auxiliary body cooling and protective clothing (cooling vests, etc.)

Administratively, supervisors can reduce the dangers of heat stress in several ways:

- Monitor weather reports for hot weather advisories and post warning signs in dangerous heat stress areas
- Reduce workers' time spent in the heat
- Implement frequent breaks
- Use tools to minimize manual strain
- Increase the number of workers per task
- Provide cool water and encourage workers to drink frequently
- Train workers and supervisors to recognize the signs of heat intolerance
- Institute a heat acclimatization plan

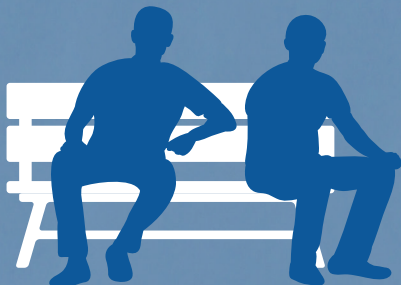
WHAT IS AN ACCLIMATIZATION PLAN?

Most healthy workers will be able to acclimate to heat after gradual exposure to hot environments. The Centers for Disease Control and Prevention suggests the following acclimatization schedule:

3 KEYS TO WORKING SAFELY IN THE HEAT

1 REST

Take frequent breaks in a cool spot.



2 HYDRATION

Drink one 8 oz. cup of water every 15-20 minutes when working in the heat.



3 ACCLIMATIZATION

Gradually expose workers to hot environments over a period of time.



DANGEROUS HEAT STRESS AREA

Heat Stress-Protective Clothing
or Equipment Required

Heat Stroke or Other
Heat-Related Illness May Occur

- Gradually increase workers' time in hot conditions over 7 to 14 days.
- New workers should start at 20% of the usual duration of work on day 1 and increase no more than 20% each day.
- Workers with previous experience should start at 50% of the usual duration of work on day 1, 60% on day 2, 80% on day 3, and 100% on day 4.
- Supervisors should carefully monitor new employees until they are fully acclimatized.

Physically fit workers require less time to acclimatize. Taking breaks in air conditioning will not affect acclimatization. A worker's level of acclimatization can be maintained for a few days of non-heat exposure.

HOW CAN WORKERS STAY HYDRATED?

Those doing moderate labor in extreme heat should drink one 8 oz. cup of water every 15-20 minutes. If sweating continues for more than two hours, replenish electrolytes with sports drinks. Avoid alcohol and large amounts of caffeine and sugar. Do not exceed 6 cups of fluid per hour.

For a more detailed look at the CDC's recommended standards regarding occupational exposure to heat, visit <https://www.cdc.gov/niosh/docs/2016-106/pdfs/2016-106.pdf>

SITTING VS STANDING



Think you know
which workstation
setup wins in the
age-old ergonomic
debate?

The link between sitting all day and health problems such as heart disease, diabetes, high blood pressure, and a host of other issues has been known for a long time. Logic might suggest that doing the opposite of sitting is the answer, and technology came up with a seemingly brilliant solution — the standing desk. However, recent research suggests that standing at a desk all day may not be any better for you than sitting at one. Let's look at a list of pros and cons:

TRADITIONAL DESK

PROS:

Sitting can be more comfortable than standing, with the right chair
Traditional desks and chairs are convenient and inexpensive compared to standing desks
Sitting can aid in recovery from injuries
Sitting helps the body feel more relaxed

CONS:

Sitting for several hours a day increases risk of obesity, certain types of cancer, type 2 diabetes, and even cognitive decline and dementia
Sitting in unhealthy positions can cause muscle stiffness, as well as diseases like spondylosis and carpal tunnel syndrome

STANDING DESK

PROS:

Standing increases circulation, which increases attention, focus, and productivity
Standing takes pressure off the lower back caused by sitting too long
Ease of communication with other employees as they are able to move freely and make eye contact while doing work

CONS:

Sore feet, especially in heels and without anti-fatigue mats
Laptops are not ergonomically conducive to using standing desks
Prolonged standing increases the risk of heart disease more than 2x that of those who mainly sit

So which workstation wins? The judges rule this one a TIE. Instead of exclusively sitting or standing, try alternating between the two every two hours or so. Step away from the desk and walk around whenever you can. The most important thing to remember when working at a desk is this:

The opposite of sitting is not standing. The opposite of sitting is moving.

STUDY SHOWS INCREASED RISK OF CANCER FOR FIREFIGHTERS

Fighting fires is one of the most dangerous jobs in the world. But the risks don't stop at the end of a firefighter's shift. Cancer kills firefighters at a rate nearly 20 times higher than the fires themselves.

Until recently, the link between firefighting and cancer had been merely speculative. In 2010, the National Institute for Occupational Health and Safety (NIOSH) began a multi-year study to try and better understand this link. NIOSH released its findings in 2016, which provided evidence that firefighters are in fact at an increased risk of certain types of cancer due to occupational exposure. The study showed the following:

- Firefighters have higher rates of digestive, oral, respiratory, and urinary cancers than the general population, as well as nearly twice the number of cases of malignant mesothelioma from asbestos exposure.
- Certain types of cancer not typically seen in patients under age 65, such as bladder and prostate cancer, were found in firefighters under 65 more frequently than in the general population.
- The chance of lung cancer increased with the amount of time spent at fires.
- The chance of leukemia increased with the number of fire runs.

Other epidemiology studies done after 9/11 have confirmed that first responders and recovery workers have significantly higher rates of thyroid, bladder, and skin cancer than the general population.

In hopes of better understanding why those in the field are at greater risk, NIOSH has created a voluntary registry of U.S. firefighters. The Firefighter Cancer Registry Act of 2018 directs the CDC to develop and maintain this registry with the hope of raising awareness of improved protections for firefighters, including advancements in the design and care of personal protective equipment, as well as practices that can lower exposure to hazardous substances.

In May 2019, Governor DeSantis signed **Senate Bill 426**, securing coverage for treatment of 21 forms of cancer, a \$25,000 payout, disability pay, and death benefits to firefighters. This coverage will be in lieu of workers' compensation.

According to Jimmy Patronis, Florida's Chief Financial Officer and Florida's fire marshal, "Seventy percent of firefighter line-of-duty deaths are cancer related, and the men and women fighting this disease need to know that Florida stands with them." Patronis has made this issue a top priority since his appointment in 2017. Florida now joins 40 other states in recognizing cancer as a workplace risk and providing benefits to firefighters. These provisions went into effect as of July 1, 2019.

In order to qualify for cancer benefits, firefighters must:

- Be employed full-time as a firefighter;
- Be employed by the state, university, city, county, port authority, special district, or fire control district;
- Have been employed by their employer for at least five continuous years;
- Be tobacco free for at least the preceding five years; and
- Have not been employed in any other position in the preceding five years which is proven to create a higher risk for cancer.

RENOUNCING THE BLACK BADGE OF COURAGE

CHANGING FIREFIGHTERS' CULTURAL NORMS REGARDING CLEAN GEAR IS THE KEY TO PREVENTING CANCER

In 2001, members of a firefighter forum were asked whether they had any work-related superstitions. Here are some of their replies:

"I have never fully cleaned [my helmet] and always had a little bit of discoloration to it, something I think I'd feel unsafe without having."

"I NEVER clean my helmet except the first time I get it."

"I never ever wash my lid."

"A big one in my department is that you NEVER clean your helmet, with the exception of the visor."

"I have NEVER cleaned my helmet and NEVER will."

"I clean my coat and bunkers, but the superstition around my station is to not ever clean your helmet."

By 2010, opinions about clean helmets had started to shift:

"I'd be embarrassed for anyone that needed a supervisor/leader to tell him to clean his personal equipment."

"If you are the type of person who likes to walk around with dirty gear and a nasty helmet because you think it makes you look more seasoned..."

"We have to keep our helmets relatively clean ... the main concern is the carcinogens..."





For some, having dirty, soot-covered gear has been seen as a sign of experience among the ranks, a “black badge of courage.” For others, it was a superstition passed down from previous generations of firefighters. But that dirt and soot harbors deadly carcinogens, even more so than in decades past. This is because modern furnishings and building materials are often made of synthetics such as polyurethane, engineered wood, and plastic, which burn hotter and faster, and release more toxic gases than natural materials such as wood and cotton fibers.

In recent years, the risk of cancer from fighting fires has come to the foreground, and experts are pushing the importance of cleaning toxins from equipment as quickly as possible after use.

Unfortunately, risk awareness is not enough without changes in behavior, and too many firefighters are ignoring the precautions. A 2018 research study surveyed 482 Florida firefighters to see how well they used their risk awareness by changing their work practices to reduce cancer risks. The results showed that while firefighters had a great deal of knowledge regarding proper cleaning and decontamination procedures, many did not follow through in practice. Only 64% of firefighters surveyed said they shower promptly (within an hour) after returning from a fire, and 10% reported that they rarely shower after a fire, if ever. A shocking 85% of firefighters admitted to not cleaning their bunker gear after returning to the station.

How can compliance with best practices to lower risks of cancer be achieved? Start by changing the cultural norms. People are more likely to follow protocols to try to fit in with the accepted behavior of their peers. National Fire Academy instructor and Battalion Chief Robert Avsec suggests two tools for department

leaders to use to increase compliance: Support a firefighter’s free will by providing training and education on safety practices and potential risks. Those who understand how the procedures work to protect them from exposure to toxic materials are better prepared to resist negative pressure from others who choose not to comply.

Fire department leaders should lead by example by always complying with protocols to reduce exposure. Firefighters are more inclined to wear their PPE when leaders wear their own.

It takes time to break old habits, so the most important key to changing cultural norms in the firehouse is persistence.

The National Volunteer Fire Council (NVFC) and four other organizations have developed a poster with information to help firefighters understand the risks and take action to protect themselves against cancer, which can be downloaded from the NVFC’s website here: <https://www.nvfc.org/wp-content/uploads/2017/12/Preventing-Cancer-poster.pdf>



WEBINAR



JOIN NOW

An email blast will be sent from the State Loss Prevention Program prior to each of these webinars with registration information.

UPCOMING TRAINING WEBINARS FOR 2019:

8/14/19

Job Safety Analysis

9/11/19

Facility & Equipment Inspections

9/25/19

Promoting Employee
Safety Awareness

All webinars will be offered on each date through GoToMeeting at both 10:00 am and 2:00 pm (Eastern Time).

For questions, contact Juana Powell in the Division of Risk Management / Loss Prevention:
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