

NUCA SAFETY

THE OFFICIAL NUCA SAFETY NEWSLETTER



VOLUME 31 | ISSUE 3

Keeping Your Employees Safe in the Heat

Employees exposed to hot and humid conditions are at risk of heat-related illness. The risk of heat-related illness becomes greater as the weather gets hotter and more humid. This situation is particularly serious when hot weather arrives suddenly early in the season, before workers have had a chance to adapt to warm weather.

For people working outdoors in hot weather, both air temperature and humidity affect how hot they feel. The "heat index" is a single value that takes both temperature and humidity into account. The higher the heat index, the hotter the weather feels, since sweat does not readily evaporate and cool the skin. The heat index is a better measure than air temperature alone for estimating the risk to workers from environmental heat sources.

Preventing Heat-Related Illness

Employers have a duty to protect their people from recognized serious hazards in the workplace, including heat-related hazards. This article should help you and supervisors prepare and implement hot weather plans. It explains how to use the heat index to determine when extra precautions are needed at a worksite to protect your people from environmental contributions to heat-related illness. Anyone performing strenuous activity, using heavy or non-breathable protective clothing, or those new to an outdoor job need additional precautions beyond those warranted by heat index alone.

Those new to outdoor jobs are generally most at risk for heat-

related illnesses. Cal/OSHA investigated 25 incidents of heat-related illness in 2005. In almost half of the cases, the individual involved was on their first day of work and in 80% of the cases they had only been on the job for four or fewer days. That's why it's important to gradually increase the workload or allow more frequent breaks to help new, or returning people after time away, build up a tolerance for hot conditions. Make sure your folks understand the risks and are "acclimatized" to the conditions.

Who are Outdoor Workers?

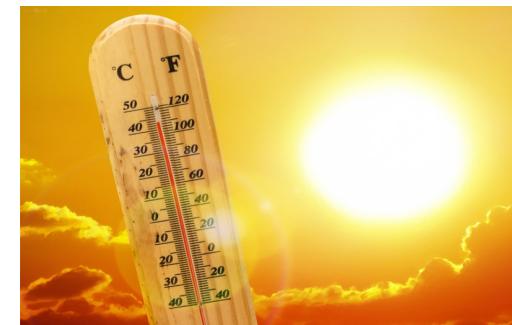
Simply put, anyone who spends a substantial portion of their shift outdoors. Some examples include those who work in the construction and agricultural industries, as well as baggage handlers, electrical power transmission and control workers, and those who work in landscaping and yard maintenance.

These people are at risk of heat-related illness when the heat index is high. Additional risk factors are listed below. These must be taken into consideration even when the heat index is lower.

- ◆ Work in direct sunlight - adds up to 15 degrees to the heat index.
- ◆ Perform prolonged or strenuous work
- ◆ Wear heavy protective clothing or impermeable suits

About the Heat Index

The U.S. National Oceanographic and Atmospheric Administration (NOAA) developed the heat index system. The heat index combines



both air temperature and relative humidity into a single value that indicates the apparent temperature in degrees Fahrenheit, or how hot the weather will feel. The higher the heat index, the hotter the weather will feel, and the greater the risk that outdoor workers will experience heat-related illness. NOAA issues heat advisories as the heat index rises. To learn more about the heat index, [visit NOAA's website](#).

Why is Humidity Important?

Relative humidity is a measure of the amount of moisture in the air. Sweat

Two Primary Sources of Heat on the Jobsite

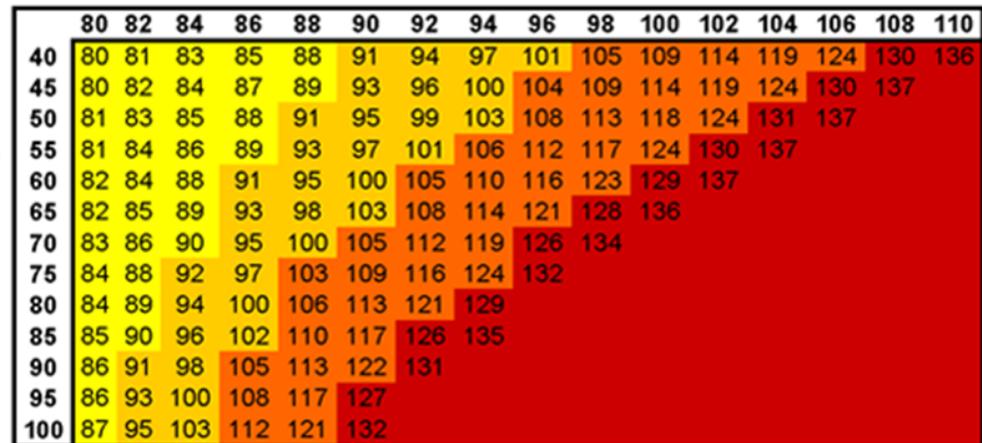
When working, people become overheated from two primary sources:

1. The environmental conditions in which they work
2. The internal heat generated by physical labor.

Heat-related illnesses occur when the body is not able to lose enough heat to balance the heat generated by physical work and external heat sources. Weather conditions are the primary external heat sources for those working outdoors.

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

Heat Index
Temperature (°F)



Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

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does not evaporate as quickly when the air is moist, as it does in a dry climate. Since evaporation of sweat from the skin is one of the ways the human body cools itself on a hot day, high humidity reduces our natural cooling potential and we feel hotter. Low humidity can also be a problem for outdoor workers in hot, desert-like climates. Sweat evaporates very rapidly in low humidity, which can lead to severe dehydration if a person does not drink enough water throughout the day.

IMPORTANT NOTE: The heat index values were devised for shady, light wind conditions, and exposure to full sunshine can increase heat index values by up to 15° Fahrenheit. To account for solar load, added precautions are recommended.

Why We Have Heat Advisories
NOAA issues extreme heat advisories to indicate when excessive, extended heat will occur. The advisories are based mainly on predicted heat index values:

- ◆ An *Excessive Heat Outlook* is issued when the potential exists for extended excessive heat (heat index of 105-110°F) over the next 3-7 days. This is a good time to check on supplies, such as extra water coolers, and refresh worker training.
- ◆ An *Excessive Heat Watch* is issued when excessive heat could occur within the next 24 to 72 hours, but the timing is uncertain.
- ◆ An *Excessive Heat Warning* is issued when the heat index will be high enough to be life threatening in the next 24 hours. This warning occurs when excessive heat is imminent or has a very high probability of occurring.
- ◆ An *Excessive Heat Advisory* is similar to an Excessive Heat Warning, but less serious. This is issued when the heat index could be uncomfortable or inconvenient, but is not life threatening if precautions are taken.

How to Use the Heat Index

The heat index can be used to help determine the risk of heat-related illness for outdoor workers, what actions are needed to protect your people, and when those actions are triggered.

Depending on the heat index value, the risk for heat-related illness can range from lower to very high to extreme. As the heat index value goes up, more preventive measures are needed to protect workers. Heat index values are divided into four bands associated with four risk levels. The NOAA bands have been modified for use at worksites.

Strenuous work and the use of heavy or specialized protective clothing have an additive effect. As a result, the risk at a specific heat index could be higher than that listed in the table above if the work is in direct sunlight without a light breeze, or if work involves strenuous tasks or the use of heavy or specialized protective clothing. Extra measures, including implementing precautions at the next risk level, are necessary under these circumstances.

The steps you should take in response to an elevated heat index are the same as you would follow to address other hazards in the workplace.

STEP 1: Develop a heat-related illness prevention plan before heat index levels rise. Use the Protective Measures to Take at Each Risk Level chart above to inform your planning. Review the pages of this article to learn more about what you can do to protect workers from heat-related illness. Use checklists to assist in planning ahead and in daily planning.

STEP 2: Train your employees before it gets hot. Train about safe work practices before heat index levels go up. Prepare your employees so that they recognize the signs and symptoms of heat-related illness, how to prevent it, and what to do if someone has symptoms. Reinforce the training on hot days.

- ◆ For heat-related illness prevention training tools and resources, OSHA has [factsheets and](#)

Plan Element	Heat Index Risk Level			
	Lower	Moderate	High	Very High/Extreme
Supplies (ensuring adequate water, provisions for rest areas, and other supplies)	✓	✓	✓	✓
Emergency planning and response (preparing supervisors and crews for emergencies)	✓	✓	✓	✓
Worker acclimatization (gradually increasing workloads; allowing more frequent breaks as workers adapt to the heat)	✓	✓	✓	✓
Modified work schedules (establishing systems to enable adjustments to work schedules)		✓	✓	✓
Training (preparing workers to recognize heat-related illness and preventive measures)	✓	✓	✓	✓
Physiological, visual, and verbal monitoring (using direct observation and physiological monitoring to check for signs of heat-related illness)		✓	✓	✓

[worksheets](#) (in English and Spanish) can help in communicating key messages about heat safety and health.

STEP 3: Track the weather for the worksite daily and assess the risk. Know how hot it will be during scheduled work activities and use this information to determine which preventive measures should be taken.

- ◆ Check with the [National Weather Service](#) to get the current or predicted heat index values and see a map of areas under [excessive heat warning](#) across the your area. Monitor weather reports daily to remain prepared for high heat index levels.

STEP 4: Implement your plan when the heat index is at or above 80° Fahrenheit. Adjust risk level based on site conditions (direct sunlight vs. shaded, with breeze), work load, and type of protective clothing.

Protective Measures to Take at Each Risk Level

The most critical actions employers should take to help prevent heat-related illness at each risk level (see next page).

Make Sure Water is Available

Water should have a palatable (pleasant and odor-free) taste and water temperature should be 50°F to 60°F, if possible. Encourage water over soda and other drinks containing caffeine and high sugar content as they may lead to dehydration. Drinks with some flavoring added may be more palatable to workers and could improve hydration. During hot weather, encourage your people to avoiding drinking alcohol after work shifts.

By using the above protective measures and training your people, you'll be ready to keep everyone safe when the heat rises. ■

Heat Index	Risk Level	Protective Measures
<91°F	Lower (Caution)	<ul style="list-style-type: none"> • Provide drinking water • Ensure that adequate medical services are available • Plan ahead for times when heat index is higher, including worker heat safety training • Encourage workers to wear sunscreen • Acclimatize workers
91°F to 103°F	Moderate	<p>If your employees must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are recommended to protect workers from heat-related illness.*</p> <p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Remind workers to drink water often (about 4 cups/hour)** • Review heat-related illness topics with workers: how to recognize heat-related illness, how to prevent it, and what to do if someone gets sick • Schedule frequent breaks in a cool, shaded area • Acclimatize workers • Set up buddy system/instruct supervisors to watch workers for signs of heat-related illness
103°F to 115°F	High	<p>If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are recommended to protect workers from heat-related illness.*</p> <ul style="list-style-type: none"> • Schedule activities at a time when the heat index is lower • Develop work/rest schedules • Monitor workers closely <p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Alert workers of high risk conditions • Actively encourage workers to drink plenty of water (about 4 cups/hour)** • Limit physical exertion (e.g. use mechanical lifts) • Have a knowledgeable person at the worksite who is well-informed about heat-related illness and able to determine appropriate work/rest schedules • Establish and enforce work/rest schedules • Adjust work activities (e.g., reschedule work, pace/rotate jobs) • Use cooling techniques • Watch/communicate with workers at all times
>115°F	Very High to Extreme	<p>When possible, reschedule activities to a time when heat index is lower</p> <ul style="list-style-type: none"> • Reschedule non-essential activity for days with a reduced heat index or to a time when the heat index is lower • Move essential work tasks to the coolest part of the work shift; consider earlier start times, split shifts, or evening and night shifts. • Strenuous work tasks and those requiring the use of heavy or non-breathable clothing or impermeable chemical protective clothing should not be conducted when the heat index is at or above 115°F. <p>If essential work must be done, in addition to the steps listed above:</p> <ul style="list-style-type: none"> • Alert workers of extreme heat hazards • Establish water drinking schedule (about 4 cups/hour)** • Develop and enforce protective work/rest schedules • Conduct physiological monitoring (e.g., pulse, temperature, etc) • Stop work if essential control methods are inadequate or unavailable.

*The heat index is a simple tool and a useful guide for employers making decisions about protecting workers in hot weather. It does not account for certain conditions that contribute additional risk, such as physical exertion. Consider taking the steps at the next highest risk level to protect workers from the added risks posed by:

- Working in the direct sun (can add up to 15°F to the heat index value)
- Wearing heavy clothing or protective gear

**Under most circumstances, fluid intake should not exceed 6 cups per hour or 12 quarts per day. This makes it particularly important to reduce work rates, reschedule work, or enforce work/rest schedules.

The Opioid Epidemic is Killing Our People

Construction workers are 6-7 times more likely to die of an opioid overdose than any other workers. Construction has the 2nd highest industry rate of pain medication and opioid misuse. Because construction work can be tough on the body, workers can suffer from reoccurring aches and pains. In one study, 75% of workers indicated that they were dealing with musculoskeletal pain. Construction injuries leave as many as 40% of its older workers with chronic pain. In this study, older workers are defined as 40 plus years old.

As could be expected, when the pain gets to be too much, workers turn to doctors or self-treat their aches and pains themselves. It's one thing to take Aspirin, Advil, Tylenol, or any of the other over-the-counter drugs, it's another when a person tries to treat him/herself with opioids.

When the injury cannot be easily diagnosed and treated, such as with soft tissue injuries, doctors frequently fall back on providing the patient with prescription painkillers, which are frequently opioids.

Prescription opioids can be used to treat moderate-to-severe pain and are often prescribed for musculoskeletal injuries, following surgery, or for cancer and other related illness where managing pain is necessary. In the past decade there has been a dramatic increase in the acceptance and use of prescription opioids for the treatment of chronic pain, such as back pain or osteoarthritis, despite serious risks and the lack of evidence about long-term effectiveness.

More recently actions are being taken to reduce the risk of abuse and misuse associated with pain medications, especially opioids. These actions include physician and patient education regarding the medications and associated risk; prescription monitoring programs; appropriate use of these medications; urine drug testing; provisions for safe disposal; referrals to pain and addiction spe-

cialists; and more. This is a national problem that needs to be addressed, because tens of thousands of workers are dying each year on and off the job from opioid overdose.

In most cases, workers are not trying to get high, they just want to control the pain but, due to the nature of opioids get hooked. When used properly, opioids can bring welcome relief for pain; however when not used as prescribed, a person could end up dead from an overdose.

Opioids trigger the release of endorphins, the brain's feel-good neurotransmitters. Endorphins muffle the perception of pain and boost feelings of pleasure, creating a temporary but powerful sense of well-being. Long-term use creates a physiological dependence on the drug and when a person attempts to stop, they will undergo withdrawal: a strong feeling of acute pain and sickness. If attempted without guidance, withdrawal symptoms can lead to death.

The Medicine Cabinet

The most common drugs involved in prescription opioid overdose deaths include:

Oxycodone is a very powerful drug which affects the nervous system, has a high potential for abuse, and can be dangerous if not used properly. Oxycodone is sold under many brand names, such as Oxycontin, Percodan, Endodan, Roxiprin, Percocet, Endocet, and Roxicet. It comes in tablet form.

Hydrocodone use has increased significantly and is available in prescription pain medications as tablets, capsules, and syrups. Brand names include Vicodin, Anexsia, Dicodid, Hycodan, Hycomine, Lorcet, Lortab, Norco, and Tussionex.

Meperidine come in tablet form but has been known to be smoked, snorted, or even crushed and injected. Brand names include Demerol, Dilaudid, and Davon. Darvon, is among the top ten drugs reported in drug abuse deaths in the US. Dilaudid, considered eight times more



potent than morphine, is often called "drug store heroin" on the streets.

Methadone (previously known as Dolophine) also belongs in the class of opioids. Used to relieve chronic pain in cancer patients and as a maintenance drug to control withdrawal symptoms in people undergoing treatment for opiate abuse.

If you are wondering where the opioids involved in abuse come from, research indicates they originate from legitimate prescriptions. Although the prescriptions are legally obtained by patients, often left-over pills are placed in the patient's medicine cabinet for future use or shared with or illegally sold to other people. It is common for those who suffer from addiction to visit multiple doctors for additional prescriptions or buy the medications from the black market.

The use of prescription opioids may impact the ability of a person to return to work and negatively affect their livelihood. If workers are under the influence of opioids while they are at work, they are likely to be at increased risk for injury. For workers in safety sensitive jobs, such as operators of heavy equipment or truck drivers, there will be significantly increased risks.

You may not understand how easily someone could become addicted to opioids. Many people believe that those who use drugs lack moral principles or willpower and that they could stop their drug use simply by



choosing to. Addiction is complex and quitting usually takes more than good intentions or a strong will.

As noted above, opioids affect brain chemistry in ways that make quitting extremely difficult and potentially dangerous, even for those who earnestly wish to do so. Fortunately, researchers know more than ever about how drugs affect the brain and have found treatments that can help people recover from drug addiction and lead productive lives.

Research shows that some risk factors make people particularly vulnerable to prescription opioid abuse and overdose, including:

- ◆ Obtaining more than one prescription from multiple doctors, dentist, and pharmacies.
- ◆ Doubling up on doses or taking more than was prescribed for daily use.
- ◆ Having a history of drug or alcohol abuse.
- ◆ Lack of knowledge and underestimating the danger.
- ◆ Chronic pain and the need to work.

Employers can help to reduce the potential of opioid use by:

- ◆ First, don't read this article and turn a blind eye to this problem because there is a good chance that one or more of your workers may have an opioid problem. Start by establishing a written prescription drug workplace policy and informing workers of the policy.
- ◆ Educating employees about responsible use of prescription opioids. When used responsibly and as directed opioids can be an effective way to temporarily control pain. It is also important to edu-

cate workers and warn them about the potency of these drugs, how they work, how they interact with other drugs/alcohol, and how they can become addictive. Make sure workers understand the risk factors for opioids abuse.

- ◆ Providing supervisor training to ensure managers/supervisors are knowledgeable about the current workplace policy for prescription drugs, potential signs of impairment, laws applicable to prescription drug use at work (ADA), and the company drug testing program.
- ◆ Communicating counseling and treatment options to all workers. If someone realizes he or a fellow worker has an abuse problem, there are ways to get treatment through the company's confidential employee assistance plan (EAP).
- ◆ Establishing a drug testing program that can identify non-medical and prescription drug abuse.
- ◆ Providing sick time when a worker is suffering from pain so he/she can get the proper treatment instead of self-treatment that could lead to addiction.

Prescription opioid use is considered to be a public health epidemic in the United States. This epidemic is far

reaching and is taking its toll in the construction industry. Because much of the workforce is aging, construction industry workers are especially at risk for opioid abuse. Many older workers are suffering from chronic pain and they need help. A vast number of these drug and opioid overdose deaths are associated with workplace injuries and illnesses.

To reverse this epidemic, employers need to try and help their workers find viable and safe solutions to pain management. Keep in mind that many of these people could be some of your best workers even though they are taking these very dangerous pain killers. They are often afraid to take time off to see a doctor, chiropractor, or pain manager because they fear losing their jobs and their income.

If you know you have an employee that is taking pain killers, offer them assistance if they need it or provide them with some sick time so they can get medical treatment for their pain or drug abuse. We know it's not easy but we must do what we can to prevent abuse, addiction, and overdose before they start.

More information about opioid use and abuse: [NSC Website](#) | [CDC Website](#) ■

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