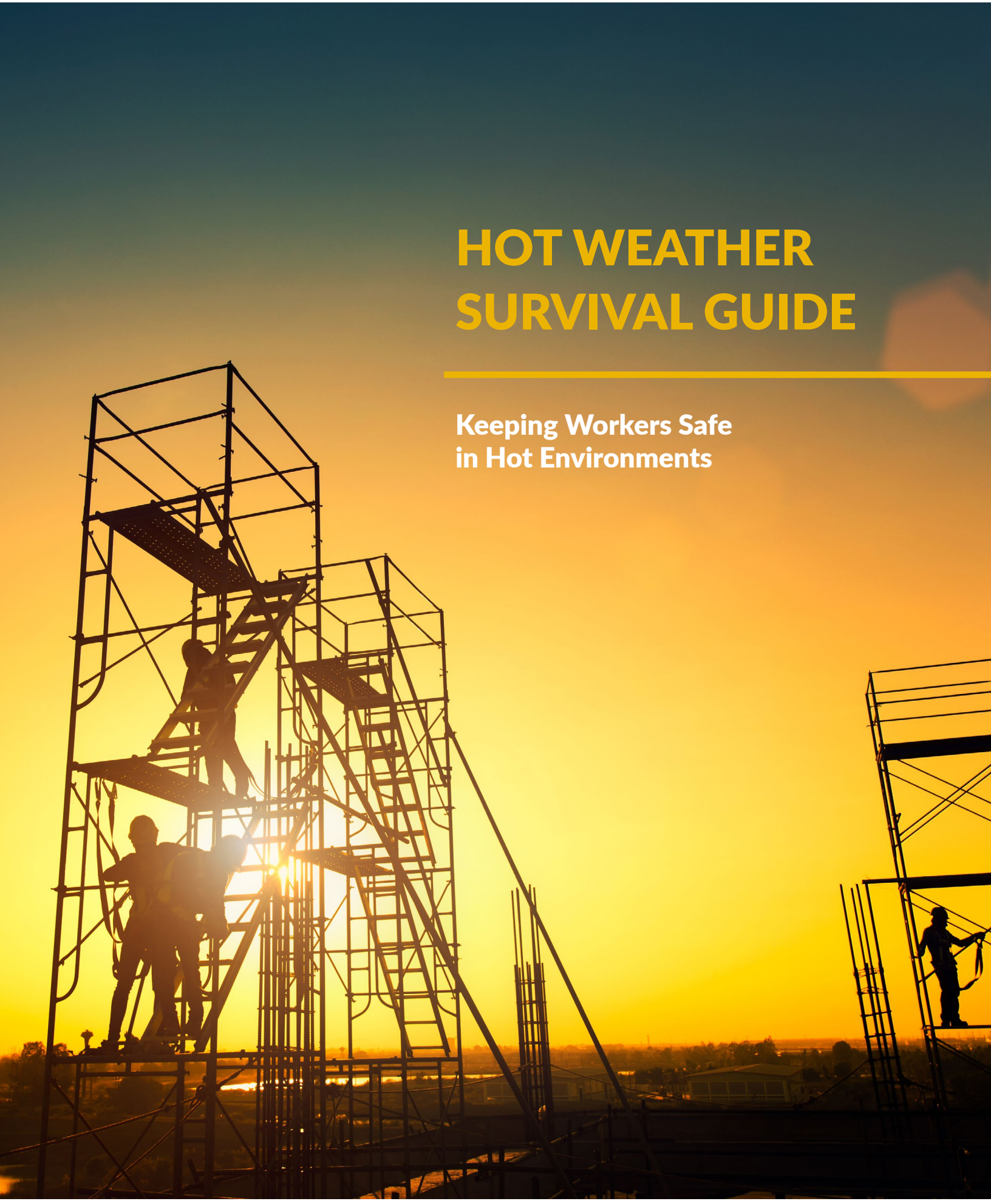

HOT WEATHER SURVIVAL GUIDE

Keeping Workers Safe in Hot Environments

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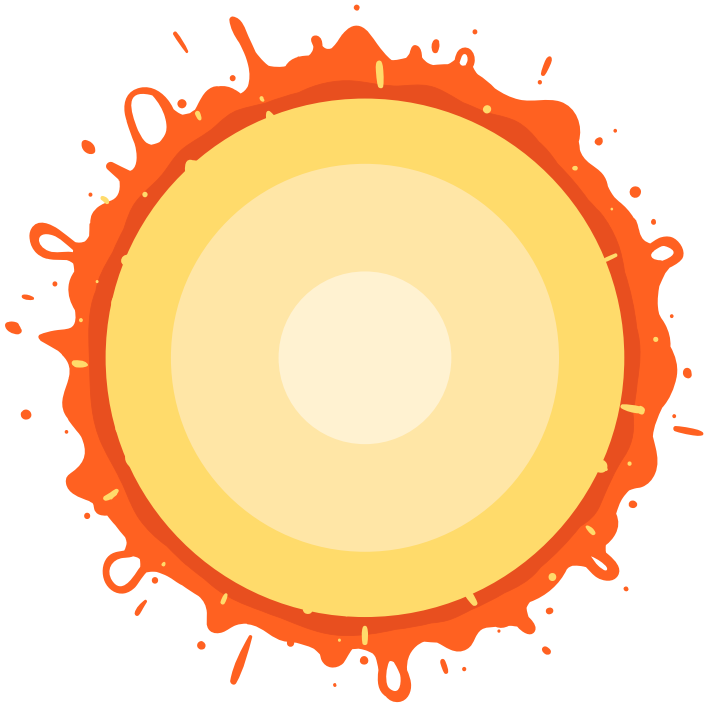

Hot temperatures and summer recreation go hand in hand. Who doesn't love a warm day at the beach or laying back on the hammock in the shade with a nice cold drink? But if you're not careful the heat can get the best of you, no matter what activity you're taking part in.

Heat-related illnesses often go unrecognized until it's too late and the damage is done. We need to understand the dangers that come with being in hot environments and the precautions we need to take. When it comes to dealing with heat-related illnesses, the saying that "an ounce of prevention is worth a pound of cure" is great advice – it's a lot easier to prevent a heat-related illness than to recover from one.

Not Knowing You're in Trouble

Alex felt great when he got to the manufacturing plant at six in the morning. By 10 o'clock, he had passed out.

We got Alex out of the heat and into an air-conditioned room. I gave him cool water to drink, mixed with a powder to replenish his electrolytes. He started feeling better almost immediately. When I followed up with him about the incident, I learned that the only drinks he had all morning were coffee and a soda. No water or sports drinks.

Every year, we train our employees on heat-related illnesses. It's not that Alex made a conscious decision to disregard his training; he just underestimated the danger associated with working in hot weather. He thought he could handle it. And he probably felt like he was handling it – until he fainted.

He was performing moderately physical work in a 100°F environment. He was dehydrated but didn't realize it until it was too late. He told me one moment he felt fine and then he remembered feeling lightheaded. The next thing he remembered was looking up from the floor into the faces of the coworkers that saw him collapse.

What happened to Alex is common but avoidable. Whether it's due to complacency or lack of knowledge and training, failing to take precautions for hot temperatures puts you at risk.

Alex was lucky: he didn't get hurt from passing out, and he quickly recovered with hydration and rest.

Your workers might not be so lucky.

What Do the Numbers Say?

Each year, more than ***600 people*** die in the United States due to extreme heat, according to the Centers for Disease Control.

Between 1999 and 2010, ***8,081 heat-related death***s were reported. In ***72***% of these cases, exposure to excessive heat was cited as the underlying cause of death. For the remaining ***28%***, the heat was deemed a major contributing factor.

Infants and children under four and the elderly (over 65) are most at risk, but adults of working age should still exercise caution.

Heat-related deaths occurred most frequently in urban areas (***81%***). The three states with the highest burden (Arizona, Texas, and California) accounted for ***43%*** of all heat-related deaths.

Survival Guide

We created this guide to keep you and your workers safe while working in hot conditions. In it, you'll find the information you need to guard against heat-related illnesses. We will cover the main factors that lead to heat-related illnesses and the appropriate precautions you need to take.

We designed this guide to be easy to navigate. It provides a quick reference for what you need to know to stay safe while exposed to extreme heat. We suggest you print copies of the guide for your employees. Share this information to prevent heat-related illness – because it sure beats having to recover from it!

Section One:

Heat-Related Illness

Heat-related illnesses are any number of illnesses brought on by exposure to heat. They range from minor sunburns to life-threatening heat strokes.

List of Heat-Related Illnesses:

- Sunburn and heat rash
- Heat cramps
- Heat exhaustion
- Heat Stroke

Many factors come into play when identifying the threat of heat-related health issues, including:

- Temperature and humidity (Heat Index)
- Clothing and PPE being worn
- Physical exertion level
- Working near heat-producing machines and equipment
- Health and fitness level
- Hydration and nutrition

Understanding these factors and making sure they don't work against us is the best preparation for heat exposure.

As you can see from the list, these are complex factors. It's not as simple as just looking at the thermometer to assess your level of risk. Top athletes can succumb to heat under fairly mild conditions if they don't hydrate properly and replenish their electrolytes.

Because of this complexity, OSHA has not set any hard and fast rules for working in the heat. There are simply too many variables to take into consideration. But make no mistake: OSHA still holds employers responsible for evaluating the risks and implementing control measures to keep all of their employees safe.

Let's look more closely at some of the risk factors.

Heat and Humidity

The combination of heat and humidity creates what is known as the Heat Index. Download and post a Heat Index chart in your workplace and make sure your employees are aware of it and understand it.

Humidity isn't always appreciated as a risk factor, but it drives up the temperature. 90°F can be uncomfortable enough on its own, but add 70% humidity and you have a Heat Index of 106°F. Factoring in the humidity is crucial. You need to know the actual heat you and your workers are exposed to before knowing what steps you should take.

Clothing and PPE

Our bodies have a natural way of dealing with the heat. We evaporate sweat to keep cool. But heavy clothing and PPE can prevent this process from happening.

Choose clothing with light colors and light fabric. Nothing says "I'm hard at work" like a sweat-soaked cotton t-shirt, but cotton will prevent sweat from evaporating and keeping the body temperature lower.

Performance apparel is a multi-billion-dollar industry, and for good reason. Performance clothing is specifically designed to wick away sweat and allow air to flow through.

If heavy clothing and PPE are inevitable, employees need to take breaks more often. They'll need to recover by resting in a cool environment and replenishing waters and electrolytes.

Physical Exertion

There is a big difference between puttering around in your garden on a summer day and working as a landscaper or on a construction site.

Hard work raises our core body temperature. The heavier the physical exertion, the greater the impact the heat will have on us.

Compensate for intense physical work with more frequent breaks and by replenishing fluids and electrolytes regularly.

Working Near Heat-Producing Machines and Equipment

Many processes require workers to be in extremely hot environments. When most people think of heat stress and heat stroke, they think of hot days spent outdoors. But the same risks apply to indoor work.

Cooling vents near workstations can go a long way to keeping workers safe. And heat-beating solutions like cooling vests and cooling towels aren't just for the outdoors.

If engineering controls can't provide enough cooling, then workers need to limit the amount of time they spend near hot equipment and be allowed frequent breaks to cool down.

Health and Fitness Levels, Hydration, and Nutrition

Age, weight, and fitness can all affect how well someone can handle exertion in heat. A healthy body will better regulate its internal body temperature to adapt to the heat.

Much of these effects come from proper hydration and nutrition. You may be in great shape and in your prime, but if you show up to work Monday after a weekend of heavy alcohol consumption and poor nutrition, your body will be in no condition to handle exertion and heat. Our bodies need fuel, including water and minerals, to handle stressful conditions. No fuel, and we crash.

Section Two:

How the Body Handles Hot Environments

Our bodies are amazing. When the temperature we're exposed to changes, our bodies adjust to maintain a constant internal temperature. One of the ways it does this is by varying the amount of blood circulating to the skin. If blood circulating close to the skin doesn't reduce the body's temperature enough, it will release sweat to cool the skin.

When the body is in good health and properly hydrated, it can regulate its internal temperature in extreme conditions. In this section, we'll look closer at how the body accomplishes this.

Heat Acclimation

When we first enter a hot environment, like a factory floor or high noon on a summer day, it feels uncomfortable, like the heat is engulfing us. But, with a little time, the body gradually acclimates to the heat. We tend to take this for granted, but it's an amazing display of versatility.

The key to acclimation is time. Those who are new to working in the heat should take things slowly and let their supervisors know they're not used to those conditions. It's the same with people who have just returned from vacation or spent time away from the hot working environment for whatever reason.

Seasoned construction workers, landscapers, and factory workers often seem like they're immune to the heat. They're not. They've just learned how their body reacts to the conditions and how to slowly acclimate themselves.

How We Can Help Our Bodies

During winters in the Sahara Desert, camels can survive six or seven months without drinking. We're re good for about three to five days. The lesson here is we can't just chug a lot of water and forget about it. We need to continually take in fluids.

Up to 60 % of the adult human body is water. But that's just an average. The brain and heart and 73% water, the lungs are about 83% water, and the muscles and kidneys are 64% water. Even our bones are somewhat watery (about 31%). It's no wonder, then, that consuming enough water is vital for our survival and the good functioning of our organs.

To help our bodies regulate temperature while exposed to heat, we need water, minerals (electrolytes), and intermittent breaks for recovery. No matter how tough we think we are, there's just no way our bodies can continue bearing the heat without proper hydration.

So, how much fluid do we need? The National Academies of Sciences, Engineering, and Medicine determined that an adequate daily fluid intake consists of:

- About 15.5 cups (3.7 liters) fluids for men
- About 11.5 cups (2.7 liters) fluids for women

That might sound like a lot, but these recommendations cover fluids from water, other beverages, and food (food accounts for about 20% of your fluid intake).

But water isn't enough. We also need to take in the right minerals. As we sweat, we lose zinc, magnesium, calcium, sodium, and potassium. Our bodies can't produce these, and they must be replenished. Drinking water alone won't cut it; we need a sports drink or mix that replenishes minerals expelled in our sweat.

How We Work Against Our Own Bodies

Understanding the things that will keep us safe while working in the heat is important. But so is knowing what we need to avoid.

Let's start with drinks. Fluid intake is good, but coffee, energy drinks, and alcohol are diuretics. That means they increase urination, which is a loss of fluid.

It's also not a good idea to introduce a stimulant into your system while working in the heat. These will increase heart rate, which may exacerbate the symptoms of heat stress.

Heavy meals should be avoided. Blood is needed to digest food. That same blood is what the body uses to cool the skin. See a problem here? Our digestive system is one of the body's most significant energy drains. So, it's best not to overload it. Eat light and save the large meal for when you finish working.

Bonus Tip: Help Your Body Along with This Cooling Life Hack

We can cool the body down by applying ice or cool water to our neck or wrist. Why those areas? Because they're the ones that have blood circulating close to the surface of the skin. That closeness is why we can feel our pulse in those spots, and it also means they're easier to cool down quickly.

Section Three

Specific Heat-Related Illnesses – What Causes Them and How to Prepare for Them

Okay, now we know why we need to respect hot environments and what's going on in our body when it reacts to the heat. Let's narrow our focus and look at specific conditions and illnesses, always with one goal in mind: preventing them.

Sunburns

Sunburns don't sound significant as far as heat illnesses go. But ask anyone who's had a bad sunburn and they'll tell you it's no picnic. Sunburns are painful, and severe ones can lead to swelling, blisters, headaches, and fever.

Anyone working in the sun should use a sunblock with an adequate SPF (sun protection factor). SPF 30 will block nearly 97 percent of UVB radiation.

Using sunblock and limiting time in the sun can also help prevent skin cancer.

Heat Cramps

The depletion of minerals can cause severe muscle cramps. That means even if you drink a lot of water to stay hydrated, it won't prevent heat cramps unless you also take in electrolytes.

That means no matter how much water you drink, you might still succumb. Taking in sports drinks as well will keep you from experiencing these debilitating muscle pains.

Symptoms: Heavy sweating, painful cramping in the legs and other muscles.

Treatment: Treat muscle cramps with rest in a cool place and sports drinks to replenish electrolytes.

Heat Exhaustion

Heat exhaustion should be taken seriously – if not dealt with quickly, it can progress to heat stroke.

A worker experiencing heat exhaustion is most likely dehydrated, low on electrolytes, or both. They may be thinking unclearly and not realize they're experiencing heat exhaustion. This is one reason why workers and supervisors need to look out for each other while working outdoors or in hot workplaces.

Symptoms: Heavy sweating, weakness, pale and clammy skin, nausea, low blood pressure, rapid pulse, fainting, and possible vomiting. High body temperature (104°F) is also possible, along with headache, rapid breathing, and quick pulse.

Treatment: Get the affected person to a cool, shaded area quickly (use an air-conditioned room if possible). Remove heavy clothing and PPE. Cool them off with a shower, bath, wet towels, or ice. If their condition does not improve within fifteen minutes, call for emergency medical help. After a person recovers from heat exhaustion, they will be more sensitive to high temperatures for a few days. They should avoid hot weather and heavy exercise until cleared by their doctor.

Heat Stroke

Heat stroke is the deadliest heat-related illness. It is brought on by the victim's inability to regulate their body's temperature. Essentially, the body has overheated and is unable to respond to it. It is a life-threatening condition.

Symptoms: In addition to all the symptoms of heat exhaustion, heat stroke can also manifest in body temperatures of 104°F or higher, red and dry skin, rapid pulse, unconsciousness, and convolutions.

Treatment: A heat stroke requires immediate emergency treatment. Left untreated, the victim risks damage to the brain, heart, kidneys, and muscles. The longer treatment is delayed, the greater these threats worsen, and the more likely the heat strokes turns fatal.

Section Four

Wrap up

We've covered all the hot topics about staying cool. You may have noticed some recurring points, such as the importance of frequent breaks, hydration, and replenishing electrolytes. But just so we don't miss anything, let's recap the do's and don'ts.

Do:

- Drink lots of water
- Replenish minerals/electrolytes by using a low-sugar sports drink
- Know the Heat Index
- Wear light-colored and lightweight clothing; look for self-wicking fabrics
- Watch out for each other while in excessive heat; we don't often recognize we're in trouble until it's too late
- Take plenty of breaks to cool off and recover
- Use a sunblock if working in direct sunlight

Don'ts:

- Don't consume alcohol or caffeine
- Don't eat large meals before working in the heat
- Don't work alone in excessive heat
- Don't overexert yourself; take needed breaks to recover

These do's and don'ts seem easy enough. And yet each year hundreds of people die from heat-related illnesses. Complacency may be our biggest threat. We need to appreciate the danger that comes with extreme heat, or with moderate heat combined with heavy exertion and other risk factors.

Remember: it's easier to plan ahead and work smart than it is to recover from a heat-related illness. Our bodies are amazing, but not indestructible.

Don't let your body overheat. Follow this guide and keep your outdoor workers and workplace hot spots safe.