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Protecting Yourself in Extreme Heat: A Guide for Construction Workers

In extreme heat, outdoor workers are at higher risk for health hazards. Here's what you need to know to protect yourself.

In extreme heat, outdoor workers are at higher risk for health hazards. The good news is that you can take smart steps to keep yourself safe. This guide, created by the Health Action Alliance in collaboration with the Korey Stringer Institute, outlines what you need to know to protect yourself and your coworkers.

Tips for Staying Safe in Extreme Heat

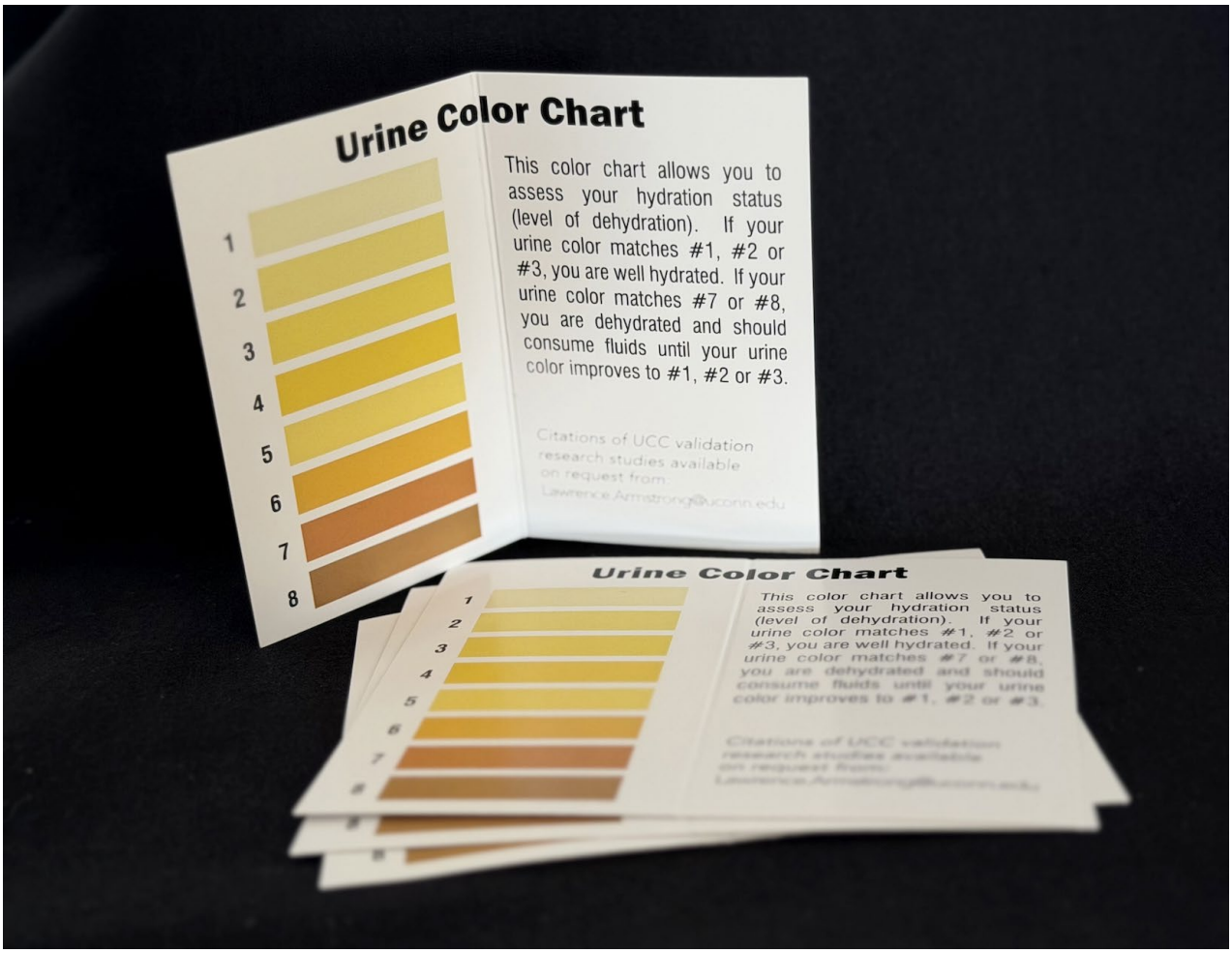
Learn your company's heat stress management policies, including what to do in a medical emergency and who to contact about heat safety concerns. If your company does not have a policy, still take proactive steps to protect yourself.

Know Your Risks

- Understand your personal risk factors, such as age, pregnancy, chronic conditions, or medications (including diuretics, blood pressure pills, and antidepressants) that can affect how your body deals with heat. Talk to your doctor about what precautions you should take.

Stay Hydrated

- Hydrate before work by drinking water a few hours before your shift. If you are thirsty before you even start, chances are you are already dehydrated.
- Drink small amounts of water frequently throughout the day before you get thirsty. Check your urine color before, during, and after work. Your urine should look more like lemonade than apple juice. Urinating five to seven times a day and pale yellow urine are signs that you are drinking enough water.
- Check your body weight each morning. If you've lost more than 2% of your weight, it's likely you are dehydrated.
- For heavy or extended work (more than two hours) in hot, humid conditions, use electrolyte powders, drinks, or popsicles to replace salt and minerals lost through sweat. Avoid alcohol, soda, and energy drinks, which can contribute to dehydration and increase your risk of heat illness. Maintain your electrolyte levels with regular, balanced meals.



Your urine should look more like lemonade than apple juice. You can request a free urine color chart from Lawrence.Armstrong@uconn.edu.

Take Breaks

- Take frequent breaks in shaded or air-conditioned areas. Rehydrate and use ice-cold or wet towels, misting fans, or cooling vests or clothing to cool as much of your body's surface as possible. If possible, complete strenuous work during cooler times of the day.

Wear Protective Clothing

- Wear lightweight, breathable, and reflective clothing, as well as sunscreen, sunglasses, phase-change cooling vests, and neck gaiters under hard hats. If safe, remove protective gear and layers during your rest breaks to help cool down.

Watch for Symptoms

- Use a buddy system to monitor yourself and your co-workers for heat illness symptoms (see a detailed list below). Maintain two-way communication with your supervisor at all times.
- Take extra caution when you are new to the job, wearing new personal protective equipment (PPE), and when you return from extended leave. You are less acclimated to your environment and at greater risk for heat illness.

Seek Help

- Seek immediate help and medical attention if you or your co-workers experience symptoms of heat illness. Heat stroke is a medical emergency, and identifying it as soon as possible can increase survival outcomes. (See a detailed list of symptoms below.)
- Report any concerns about workplace health and safety practices to your supervisor, safety manager, HR leader, or other designated contact.

Monitor Your Environment

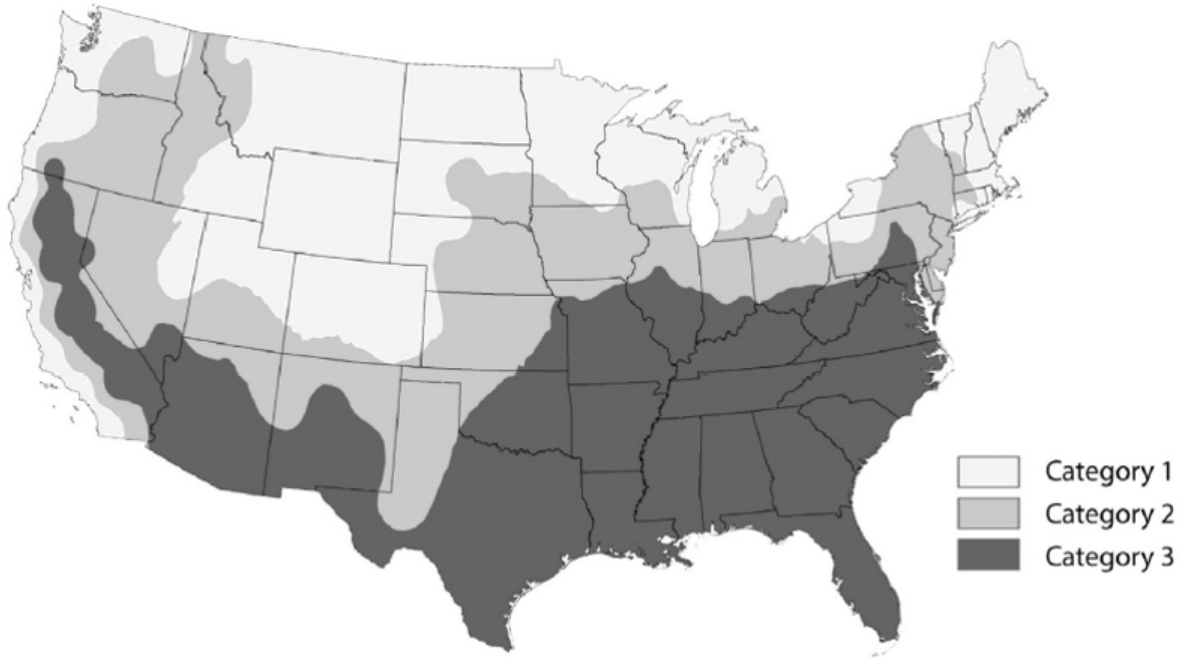
Your job site may use the wet bulb globe temperature (WBGT) or heat index (HI) to monitor environmental changes and assess risk. It's important to understand the differences between the two, especially how they are measured and what safe levels are for each.

You can use weather forecasts and on-site monitoring tools — such as the AIHA Heat Stress App or OSHA-NIOSH Heat Safety Tool App — to anticipate heat risks each day. When the estimated WBGT or heat index is high, be extra cautious.

Disclaimer: Always check with local officials for appropriate actions and activity levels. Experienced heat stress will depend upon duration and intensity of activity and personal health and vulnerability.

WBGT by Region (°F)			Threat Level WBGT at these values increasing heat stress.	Risk of heat illness
Region 1	Region 2	Region 3		
<72.3	<75.9	<78.3	Low Threat	Increased risk for heat illness
72.3 - 76.1	75.9 - 78.7	78.3 - 82.0	Elevated Threat	
76.2 - 80.1	78.8 - 83.7	82.1 - 86.0	Moderate Threat	
80.1 - 84.0	83.8 - 87.6	86.1 - 90.0	High Threat	
>84.0	>87.6	>90.0	Extreme Threat	

Regions are from Grundstein, A., Williams, C., Phan , M and Cooper, E., 2015. Regional heat safety thresholds for athletics in the contiguous United States. Applied Geography, 56, pp.55-60. 10.1016/j.apgeog.2014. 10. 014



WBGT region-specific risk thresholds (NOAA)

WBGT

An on-site WBGT meter is the most accurate way to measure heat stress. It accounts for temperature, humidity, wind speed, and radiant heat from surfaces like asphalt and machinery. For example, asphalt can exceed 140°F even when air temperatures are only 86°F.

WBGT also recognizes differences between regions of the country and has region-specific and work intensity thresholds for assessing risk.

Heat Index

The heat index measures how hot it feels outside based on air temperature and humidity. However, the HI doesn't account for radiation or air flow.

Recognizing Signs of Heat Illness

Monitor yourself and your colleagues for signs of heat illness, including sunburn, heat rash, heat cramps, and dehydration. Pay special attention to signs of heat exhaustion and heat stroke, including physical symptoms and changes in behavior. If you see symptoms, act fast.

Heat Exhaustion

Heat exhaustion occurs when the body loses too much water and salt, usually through excessive sweating.

Signs and Symptoms

- Inability to continue work
- Excessive tiredness/fatigue
- Thirsty
- Weak
- Dizzy
- Vomiting
- Lightheaded
- Muscle cramps
- Wobbly walking
- Slow reaction time
- Blurred vision
- Nausea
- Fast and weak pulse

Act Fast

- Move to a cool place.
- Lie down and elevate your legs.
- Take frequent sips of cool water.
- Loosen or remove unnecessary clothing, including shoes and socks.
- Cool your body with ice, cold towels, or fanning.
- If your symptoms persist or worsen, get immediate medical attention on-site, go to your nearest urgent care clinic or emergency room, or call 911.

Exertional Heat Stroke

Exertional heat stroke is the most serious heat-related illness. It occurs when core body temperature reaches dangerously high levels and can lead to death or permanent disability. The faster you act, the higher the chances of survival. Call 911 right away.

Signs and Symptoms

- Body temperature over 104.5 degrees Fahrenheit

Confusion or disorientation

- Erratic or irritable behavior
- Collapsing/fainting
- Loss of consciousness
- Vomiting
- Garbled speech or gibberish
- Convulsions
- Severe fatigue
- Nausea
- Rapid and strong pulse
- Sweating profusely (this may not occur in cases of classic heat stroke)

Act Fast

- CALL 911.
- Stay with the person until emergency medical care arrives.
- Move the person to a cooler place and remove their outer clothing.
- Put the person in a tub or kiddie pool with ice water immediately.
- If no tub is available, rotate ice-cold towels over the surface of their body while fanning them.

This guide was developed by the Health Action Alliance in collaboration with the Korey Stringer Institute (KSI) at the University of Connecticut, with guidance from the following contributors:

- Gabrielle J. Brewer, is Associate Director of KSI at the University of North Florida. Dr. Brewer is also the Vice Chair of the Thermal Stress Working Group at the American Industrial Hygiene Association (AIHA) and has provided heat safety education to a variety of companies, including NASA and Delta. She manages U.S. Department of Defense, Defense Advanced Research Projects Agency (DARPA), and corporate-sponsored grants focused on integrative physiology to improve

health, safety, and performance of athletes, warfighters, and workers.

- Douglas Casa, PhD, ATC, is CEO of KSI. Dr. Casa, a Board of Trustees Distinguished Professor of Kinesiology at the University of Connecticut, is an expert on maximizing performance during exercise in the heat and the prevention, recognition, and treatment of exertional heat stroke. Dr. Casa has successfully treated 425 cases of exertional heat stroke with zero fatalities, and has provided heat safety expertise to the International Olympic Committee, among other organizations.
- Robert Huggins, PhD, LAT, is Chief Research Officer and President of Occupational Safety and Athlete Performance at KSI. Dr. Huggins provides heat safety policy and risk mitigation services and expertise to the airline, food, construction, manufacturing, and postal delivery service industries. His research focuses on the impact that hot environments have on human physiological responses, including the effects of cooling, hydration, and heat acclimatization.
- Maggie Morrissey-Basler, PhD, is Senior Occupational Heat Safety Advisor at KSI and an assistant professor at Providence College. Dr. Morrissey-Basler served on the subcommittee for the A10.50 Voluntary Heat Stress Standard in Construction and Demolitions and has authored over 30 publications on occupational heat stress, hydration, and related topics. Her research focuses on preventing occupational heat stress and heat-related illnesses and injuries in workers. Additionally, she has served as a consultant and expert speaker at industrial conferences and companies, often focusing on enhancing heat stress management plans.
- Cecilia Kaufman, MS, is Senior Scientist of Occupational Safety at KSI. Kaufman is also an athletic trainer and serves as the Secretary of the Thermal Stress Working Group at AIHA. Kaufman has provided education and services regarding heat safety policy and risk mitigation to the airline, food, construction, manufacturing, oil and gas, and postal delivery service industries.

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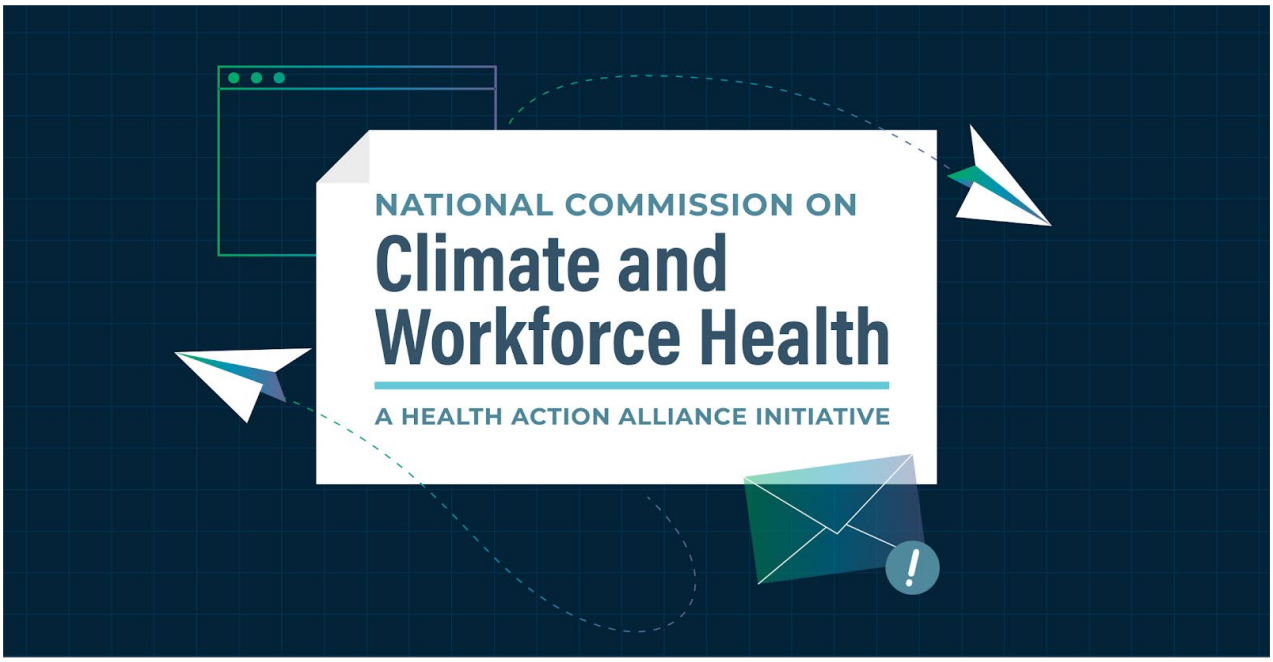

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posed by extreme weather.

The Commission was created by the Health Action Alliance in partnership with Mercer and with strategic input from the CDC Foundation. Additional support for the initiative is being provided by The Hartford. Learn more at ClimateHealthCommission.org.

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