



Heat and Health

For Providers

This sheet is an overview on heat, providing background of how heat impacts health and how providers can help patients prepare.

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Temperatures of concern

Hot conditions can be dangerous. The temperatures that increase the risk of harm for individuals with certain conditions or who are regularly exposed to heat may be lower than those considered dangerous by many people. For most cities in the United States, the minimum mortality temperature (the temperature above which mortality rates increase) is often just below that city's 80th percentile of the annual temperature range.¹

The National Weather Service (NWS) issues heat advisories, excessive heat watches and excessive heat warnings. To see if a heat alert has been issued for your location, check the weather app on your smartphone, or go to [weather.gov](https://www.weather.gov) and click on your county or type in your zip code. For more details on how to access NWS alerts for heat (and other weather extremes), as well as the differences between heat watches and warnings, see the accompanying toolkit document titled [Weather Hazard Monitoring](#).

Additionally, the CDC, in partnership with NOAA, EPA and NWS have released a HeatRisk map you can use to identify your risks from heat by zip code which is available at: <https://ephtracking.cdc.gov/Applications/HeatRisk/>. If you would like to receive email alerts when HeatRisk predicts dangerous heat in your location, you can sign up to receive alerts from the Climate Central / Harvard C-CHANGE system [here](#).

Temperatures tend to peak in the mid-to-late afternoon. The time of day with the highest temperatures for your location can be found at weatherspark.com. It is not only the hottest time of the day that is dangerous, however; high nighttime temperatures affect sleep and do not allow people respite from a long hot day and are also dangerous to people's health.²

Patient case

A 46-year-old male construction worker presents to your clinic complaining of fatigue and headaches. These have been occurring for the past couple of weeks since the onset of hot weather and are worse in the afternoon and evening hours. The patient reports that he mostly drinks soda at work, and usually works through lunch trying to make overtime. He also takes a diuretic (hydrochlorothiazide) for hypertension.

What are some actions you could suggest to this patient to help reduce his risk of dehydration, electrolyte abnormalities, and heat exhaustion?

Populations at high risk

Certain people are at particularly **high risk from heat exposure**, for example people who are older, pregnant, or have chronic medical conditions including heart disease, diabetes, hypertension, mental health conditions, and neurological diseases.^{3,4,5} People who are **unable to limit their heat exposure** are also at increased risk for heat related illness, including outdoor workers, military personnel, people who use drugs, and persons experiencing homelessness. A wide variety of conditions can be exacerbated by hot weather. For example, exposure to high ambient temperatures can increase morbidity and mortality from cardiovascular-related events, including myocardial infarction, heart failure, and arrhythmias^{6,7}, as well as lead to increases in violence and traumatic injury.⁸ Heat exposure during the first trimester can predispose to birth defects^{9,10} and higher ambient temperatures throughout pregnancy are associated with greater risk of low birthweight, stillbirths, and preterm birth.^{11,12} Additionally, medications such as antipsychotics, antidepressants, antihypertensives and anticholinergics have been shown to be associated with increased risk of heat-related harm.^{13, 14, 15}

Markers of dehydration and treatment

During exposure to heat, people should watch for signs of dehydration, including physical symptoms and markers such as weight loss and urine color. Symptoms include nausea, headaches, dizziness, or excessive sweating or hot dry skin. One of the best ways to assess hydration status is by changes in weight, with weight loss indicating dehydration. Although most studies focus on weight as a marker of hydration status in athletes, weight loss is also a marker of dehydration during heat waves or excessive heat in non-athletes, resulting from sweat induced fluid losses.^{16, 17} Laboratory studies show urine color is a sensitive marker of dehydration; there is limited published evidence of the accuracy of this method in real-world and clinical settings, but it currently serves as a practical method of assessing hydration.¹⁸ It is important to note that urine color may correlate less well with other markers of hydration (such as urine osmolality and specific gravity) in adults over 60 years old.¹⁸

Time to cooling is also incredibly important to reduce morbidity and mortality in heat related illness. Counsel patients that if someone is hot and showing signs of heat related illness such as heat stroke, it is very important to start cooling while calling 911 and waiting for transport. Patients can be cooled with fans and spraying cool water, moving to a nearby cool space (shade or air-conditioned room), and placing ice packs on groin, axilla, and neck; putting the patient in ice water is also highly effective if they are awake and able to breathe safely.¹⁹

Built environment

The forecast temperature available to patients may not accurately represent the temperature they are exposed to in their home, workplace, schools, or community. The upper floors of multi-story buildings, especially those without air conditioning, may be much hotter than lower levels.²⁰

Urban heat island effects means that cities can be hotter than nearby areas, due to factors such as fewer trees and greenspaces, more concrete, and more traffic. Populations of color, Hispanic communities, and lower-wealth communities often live in neighborhoods with greater heat island effects.⁷ Unhoused individuals are at particularly high risk of heat exposure.²¹ Additionally, workers who are regularly exposed to heat at work without protections often suffer detrimental health effects.²²

Anticipatory guidance for providers to give patients

Anticipatory guidance for hot days may help patients take steps to protect their health. The strategies and resources below may be helpful for you to provide to patients who are at risk from heat. We also encourage you to share the **Heat Action Plan and Tip Sheet** and **Medications and Heat (For Patients)** included in this toolkit; some patients may find it helpful for you to fill these out with them.

Guidance for patients may include:

- Before going outside, check the weather forecast on your phone, television, radio, or online and consider signing up for local heat alert messaging.
- If a patient does not have a thermostat or thermometer that measures room temperature in their home, they can buy one for a small amount at local stores or online. Consider distributing inexpensive thermometers at your clinic.
 - Indoor temperatures in the patient's home should ideally remain <80°F. If they cannot keep the temperature below 80°F, they should use a fan, up to about 95°F when fans do not significantly help cooling²³ and may actually become harmful.

- The most effective means for cooling is moving to an air-conditioned space until the temperature cools, such as a family, friend, or neighbor's house, as well as cool spaces such as cooling centers, movie theaters, libraries, or places of worship.
- If air conditioning is not available, the basement of a building may be cooler than its upper floors.

Advise patients to watch for signs of dehydration and monitor weight loss and urine color.

- When a heat advisory or heat alert has been announced (see **Weather Hazard Monitoring** for more information), advise patients to:
 - Follow their heat action plan (see **Heat Action Plan and Tip Sheet** for guidance).
 - If a heat advisory is issued, at-risk patients should stay indoors in an air-conditioned space when possible. If going outside is necessary, limit outdoor activities, especially during the hottest part of the day (typically 11AM to 3 PM).
 - During extreme heat, patients should remain in air-conditioned spaces until the warning expires.
 - Be as safe at work as possible. Workers also have right to a safe workplace and should try to avoid heat related illness. Information is available from Occupational Safety and Health Administration here: <https://www.osha.gov/heat/worker-information>.

Heat health action plans

For many patients, it may be worth discussing a heat action plan. Guidance for patients should be based upon an assessment of the severity of their disease, comorbidities, medications, occupation (especially if outdoors), access to air conditioning at home, and dangerous heat exposure from an urban heat island, workplace, or the home environment, as well as their previous experience with heat.

Prior to a heat event, you can work with an individual's healthcare team to develop a plan. We recommend that you familiarize yourself with the **Heat Action Plan and Tip Sheet** provided in the toolkit and make sure patients review it. Different members of the healthcare team can learn to review the plan and tip sheet with patients, including community health workers, social workers, patient navigators or other trained members of the team. The action plan can be provided during care visits and can be the basis for a discussion around safety planning and care management in the event of extreme heat. Action plans should be completed before the heat season in your location.

In addition to sharing how to create a heat action plan with your patients, consider also sharing the heat tip sheet and action plan materials included in this toolkit.

Notes:

References

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