

## Preparing for Extreme Heat

Extreme heat is defined as a period of excessively hot weather, with higher than average temperatures for a particular region, combined with high humidity.<sup>1</sup> Extreme heat events can happen anywhere in the United States. Extreme heat commonly occurs in the summer;<sup>2</sup> however the main season for heat waves may vary regionally.<sup>3</sup> During the past 10 years, the National Oceanic and Atmospheric Administration indicates that heat waves have resulted in the highest annual average of deaths among all weather-related disasters.<sup>4</sup>

The greatest risk factors for heat-related deaths are bed confinement due to medical illness, living alone, being socially isolated, and not having access to air conditioning.<sup>5</sup>

### Extreme Heat Safety Tips:

- Stay indoors, especially during the warmest part of the day (typically 11 am to 2 pm), and, if at all possible, stay in an air-conditioned place. If your home does not have air conditioning or it fails, go to a public building with air conditioning such as a shopping mall, public library, or community center.
- Wear lightweight, light-colored, loose-fitting clothing.
- If you must be outside, protect yourself from the sun by wearing a wide-brimmed hat (also keeps you cooler) and sunglasses and by putting on sunscreen of SPF 15 or higher. Avoid strenuous activity. If you must work, take frequent breaks.
- NEVER leave anyone in a closed, parked vehicle.
- Although any one at any time can suffer from heat-related illness, some people are at greater risk than others. Check regularly on:
  - Infants and young children
  - People aged 65 or older
  - People who have a mental illness
  - Those who are physically ill, especially with heart disease or high blood pressure
- Get to know symptoms for heat stroke, heat exhaustion, heat cramps and sunburn and how to respond immediately.

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<sup>1</sup> Centers for Disease Control and Prevention, "Extreme Heat: A Prevention Guide to Promote Your Personal Health and Safety," Last updated July 31, 2009: 1, [http://www.bt.cdc.gov/disasters/extremeheat/heat\\_guide.asp](http://www.bt.cdc.gov/disasters/extremeheat/heat_guide.asp).

<sup>2</sup> Ibid.

<sup>3</sup> Environmental Protection Agency, "Excessive Heat Events Guidebook," (June 2006): 9.

<sup>4</sup> National Weather Service, Hazard Statistics, "Weather Fatalities," [http://www.nws.noaa.gov/os/hazstats/resources/weather\\_fatalities.pdf](http://www.nws.noaa.gov/os/hazstats/resources/weather_fatalities.pdf).

<sup>5</sup> Environmental Protection Agency, "Excessive Heat Events Guidebook," (June 2006): 17.

## Heat Watches and Warnings

The National Weather Service (NWS) issues [heat advisories and excessive heat warnings](#) when unusual periods of hot weather are expected.

- Heat Outlooks: The potential exists for an excessive heat event in the next 3-7 days.
- Excessive Heat Watches: Conditions are favorable for an excessive heat event in the next 24 to 72 hours.
- Excessive Heat Warning and Advisory: Issued within 12 hours of the onset of extremely dangerous heat conditions.<sup>6</sup>

When the NWS issues an Excessive Heat Warning, plan to stay indoors in an air conditioned space as much as possible and limit your exposure to the sun.<sup>7</sup> When at home, stay on the lowest floor because cooler air sinks. Warmer air rises.<sup>8</sup> Do not use the stove or oven to cook because it raises the indoor temperature.<sup>9</sup>

Contact your local emergency management agency or health department to learn about community cooling center plans. If you do not have air conditioning or if the air conditioning in your home is off due to a power outage, consider spending the warmest part of the day in a public building with air-conditioning such as a library, school, movie theater, shopping mall or other community facility.<sup>10</sup>

## Prepare Your Home Now

Install temporary window reflectors (for use between windows and drapes), such as aluminum foil-covered cardboard, to reflect heat back outside.<sup>11</sup> Weather-strip doors and window sills to keep cool air in. Cover windows that receive morning or afternoon sun with drapes, shades, awnings or louvers.<sup>12</sup>

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<sup>6</sup> National Weather Service, "Heat Watch vs. Warning," <http://www.nws.noaa.gov/om/heat/ww.shtml>.

<sup>7</sup> Centers for Disease Control and Prevention, "Extreme Heat: A Prevention Guide to Promote Your Personal Health and Safety," last updated July 31, 2009: 1, [http://www.bt.cdc.gov/disasters/extremeheat/heat\\_guide.asp](http://www.bt.cdc.gov/disasters/extremeheat/heat_guide.asp).

<sup>8</sup> Environmental Protection Agency, "Excessive Heat Events Guidebook," (June 2006): 18.

<sup>9</sup> The New York City Department of Health and Mental Hygiene, "Extreme Weather: Heat Illness and Heat Waves," 2014. <http://www.nyc.gov/html/doh/html/em/heat.shtml>.

<sup>10</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 2," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-2.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-2.asp).

<sup>11</sup> Federal Emergency Management Agency, "Extreme Heat," <http://www.ready.gov/heat>.

<sup>12</sup> National Renewable Energy Laboratory (a Department of Energy National Laboratory), "Cooling Your Home Naturally," October 1994: 1, 2, 5, 6, <http://www.nrel.gov/docs/legosti/old/15771.pdf>.

While electric fans may provide comfort, they do not prevent heat-related illness when the temperature is in the high 90s.<sup>13</sup>

### ✓ **Air Conditioning**

Install window air conditioners snugly, and insulate if necessary. Inspect air conditioning ducts for proper insulation.<sup>14</sup>

### ✓ **Water**

In the event of extreme heat, ensuring you have at least 1 gallon of water per person per day for at least 3 days in your Disaster Supply Kit is extremely important. **More water should be stored** if you live in a hot climate or an extreme heat event is predicted.<sup>15</sup> When deciding how much water to store, keep in mind that an average person needs to drink about three-quarters of a gallon of fluid daily. Individual needs vary depending on age, gender, health, level of activity, food choices, and climate. You will also need stored water for food preparation and sanitation.

Visit Ready.gov for more information on making an emergency kit and building a family communication plan:

- Create [an emergency kit](#) and find specific water guidance here: [www.ready.gov/water](http://www.ready.gov/water)
- Your [emergency communication plan](#) should include checking on the welfare of family members and vulnerable neighbors during a heat wave.

## **Outdoors**

If you are outside, limit your exposure to the sun.<sup>16</sup> Seek shade or wear a wide-brimmed hat to protect your face and to keep cool.<sup>17</sup> Dress in loose-fitting, lightweight and light-colored clothes that cover as much skin as possible if you are going to be in direct sunlight.<sup>18</sup> Avoid layers and heavier fabrics such as wool; and choose polyester or cotton whenever possible as it “breathes” better.<sup>19</sup> Wear high SPF sunscreen and reapply it often.

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<sup>13</sup> Centers for Disease Control and Prevention, “Extreme Heat Prevention Guide – Part 2,” last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-2.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-2.asp).

<sup>14</sup> National Renewable Energy Laboratory (a Department of Energy National Laboratory), “Energy-Efficient Air Conditioning,” June 1999: 3, 4, <http://www.nrel.gov/docs/fy99osti/17467.pdf>.

<sup>15</sup> Centers for Disease Control and Prevention, “Yellow Book: Chapter 2 Problems with Heat and Cold,” <http://wwwnc.cdc.gov/travel/yellowbook/2016/the-pre-travel-consultation/problems-with-heat-cold>.

<sup>16</sup> Environmental Protection Agency, “Excessive Heat Events Guidebook,” (June 2006): 18.

<sup>17</sup> Centers for Disease Control and Prevention, “Extreme Heat Prevention Guide – Part 2,” last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-2.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-2.asp).

<sup>18</sup> Jonathan A. Becker and Lynsey K. Stewart, “Heat-Related Illness,” *American Family Physician* 83, no. 11 (June 1, 2011): 1326.

<sup>19</sup> M. Brazaitis, et al, “The effect of two kinds of T-shirts on physiological and psychological thermal responses during exercise and recovery,” *Applied Ergonomics* 42, no. 1 (December 2010): 46.

Slow down and avoid strenuous activity. Avoid strenuous work during the warmest part of the day (usually 11 a.m. – 2 p.m.). Postpone outdoor games and activities. Use a buddy system when working in extreme heat, and [take frequent breaks](#).<sup>20</sup>

## Vehicles

Never leave a child or animal inside a vehicle on a hot day. Even with cracked windows, interior vehicle temperatures can rise almost 20°F within the first 10 minutes. Any person or animal left inside is at risk for serious heat-related illnesses, or even death.<sup>21</sup>

## Heat-Related Illness and Treatment

Heat-related illness is preventable.<sup>22</sup> Heat-related illnesses include: sunburn, heat cramps, heat exhaustion, and heat stroke due to lack of sufficient indoor cooling from air conditioning or outdoor over-exposure.<sup>23</sup> Early recognition of symptoms and accurate measurement of core temperature are critical to diagnosis, care, and timely medical treatment.<sup>24</sup> See proper treatment for each illness below and in the Center for Disease Control and Prevention's [Extreme Heat Guide](#) and e-learning course [Recognizing, Preventing and Treating Heat-Related Illness](#).

### Sunburn

Symptoms:

- Skin becomes red, painful, and abnormally warm after sun exposure.<sup>25</sup>

If these symptoms are observed:

- Take a cool shower and moisturize the affected area with lotion or aloe vera. Do not use salve, butter, or ointment.<sup>26</sup>
- Avoid repeated sun exposure.<sup>27</sup> Cover the sunburn with a tightly woven fabric if you must go outside in the sun.<sup>28</sup>

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<sup>20</sup> Centers for Disease Control and Prevention, "Heat-Related Deaths Among Crop Workers – United States, 1992-2006," *Morbidity and Mortality Weekly Report* 57, no. 24 (June 20, 2008): 649-653.

<sup>21</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 2," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-2.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-2.asp).

<sup>22</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 1," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide.asp).

<sup>23</sup> Johns Hopkins Medicine, "Heat-Related Illnesses (Heat Cramps, Heat Exhaustion, Heat Stroke)," [http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related\\_illnesses\\_heat\\_cramps\\_heat\\_exhaustion\\_heat\\_stroke\\_90.P01611/](http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related_illnesses_heat_cramps_heat_exhaustion_heat_stroke_90.P01611/).

<sup>24</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 1," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide.asp).

<sup>25</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>26</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>27</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp), 2016.

<sup>28</sup> Dr. Peter Gies and Alan McClellan, "What is Sun Safe Clothing," <http://www.skincancer.org/prevention/sun-protection/clothing/protection>.

- Sunburns draw fluid to the skin's surface (and away from the rest of the body) so drink extra water to remain hydrated.<sup>29</sup>
- Do not break blisters.<sup>30</sup> Apply dry, sterile dressings to any blisters, and take ibuprofen to help reduce inflammation.<sup>31</sup>
- Seek medical attention if the victim has a fever, fluid-filled blisters, or severe pain.<sup>32</sup>

## Heat Cramps

### Symptoms:

- Muscle pains or spasms, usually in the abdomen, arms, or legs, which may occur with strenuous activity.<sup>33</sup>

If these symptoms are observed:

- Get the person to a cooler location and remove excess clothing.
- Give cool sports drinks containing salt and sugar. Do not give liquids with caffeine or alcohol.<sup>34</sup> Discontinue liquids if victim is nauseated.<sup>35</sup>
- Seek medical attention if: the cramps do not subside in an hour, the victim has heart problems, or is on a low-sodium diet.<sup>36</sup>

## Heat Exhaustion

### Symptoms:

- Heavy sweating
- Paleness
- Muscle Cramps
- Tiredness
- Weakness
- Dizziness
- Headache

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<sup>29</sup> The Skin Cancer Foundation, "Five Ways to Treat a Sunburn," <http://www.skincancer.org/prevention/sunburn/five-ways-to-treat-a-sunburn>.

<sup>30</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-2.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-2.asp).

<sup>31</sup> The Skin Cancer Foundation, "Five Ways to Treat a Sunburn," <http://www.skincancer.org/prevention/sunburn/five-ways-to-treat-a-sunburn>

<sup>32</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>33</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>34</sup> Johns Hopkins Medicine, "Heat-Related Illnesses (Heat Cramps, Heat Exhaustion, Heat Stroke)," [http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related\\_illnesses\\_heat\\_cramps\\_heat\\_exhaustion\\_heat\\_stroke\\_90.P01611/](http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related_illnesses_heat_cramps_heat_exhaustion_heat_stroke_90.P01611/).

<sup>35</sup> Environmental Protection Agency, "Excessive Heat Events Guidebook," (June 2006): 11, [http://www.epa.gov/sites/production/files/2014-07/documents/ehguide\\_final.pdf](http://www.epa.gov/sites/production/files/2014-07/documents/ehguide_final.pdf).

<sup>36</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

- Nausea or vomiting
- Fainting<sup>37</sup>

If these symptoms are observed:

- Move victim to air-conditioned place and lie down.<sup>38</sup> Loosen or remove clothing.<sup>39</sup>
- Cool the victim by placing them in a cool shower or bath, or by applying cool, wet cloths.
- Give sips of water or cool sports drinks containing salt and sugar. Do not give liquids with caffeine or alcohol. Discontinue liquids if victim is nauseated.
- Seek immediate medical attention if there is no improvement, the victim is unable to take fluids, vomiting occurs, or any symptoms are severe.<sup>40, 41</sup>

## Heat Stroke

Symptoms:

- Extremely high body temperature, above 103°F taken orally
- Red, hot, and dry skin, without sweat
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness<sup>42</sup>

If these symptoms are observed:

- Call 911 or emergency medical services, or get the victim to a hospital immediately. Delay can be fatal.<sup>43</sup>
- Until the emergency medical personnel arrive on scene or during transport to the hospital, take the following measures:
  - Move victim to a cooler environment,<sup>44</sup> and remove the victim's clothing.<sup>45</sup>

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<sup>37</sup> Centers for Disease Control and Prevention, ““Extreme Heat Prevention Guide – Part 3,” last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>38</sup> Randell K. Wexler, “Evaluation and Treatment of Heat-Related Illnesses,” *American Family Physician* 65, no. 11 (June 2002): 2310.

<sup>39</sup> Johns Hopkins Medicine, “Heat-Related Illnesses (Heat Cramps, Heat Exhaustion, Heat Stroke),” [http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related\\_illnesses\\_heat\\_cramps\\_heat\\_exhaustion\\_heat\\_stroke\\_90.P01611/](http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related_illnesses_heat_cramps_heat_exhaustion_heat_stroke_90.P01611/).

<sup>40</sup> Centers for Disease Control and Prevention, ““Extreme Heat Prevention Guide – Part 3,” last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp), accessed March 14, 2016.

<sup>41</sup> Johns Hopkins Medicine, “Heat-Related Illnesses (Heat Cramps, Heat Exhaustion, Heat Stroke),” [http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related\\_illnesses\\_heat\\_cramps\\_heat\\_exhaustion\\_heat\\_stroke\\_90.P01611/](http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related_illnesses_heat_cramps_heat_exhaustion_heat_stroke_90.P01611/).

<sup>42</sup> Centers for Disease Control and Prevention, ““Extreme Heat Prevention Guide – Part 3,” last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>43</sup> James L. Glazer, “Management of Heatstroke and Heat Exhaustion,” *American Family Physician* 71, no. 11 (June 1, 2005): 2138.

<sup>44</sup> James L. Glazer, “Management of Heatstroke and Heat Exhaustion,” *American Family Physician* 71, no. 11 (June 1, 2005): 2138.

- Cool the victim using whatever methods are available. Try a cool bath, sponging, ice packs, or wrap the victim's body in a cold, wet sheet to reduce core body temperature.<sup>46, 47</sup>
- Monitor body temperature, and continue cooling efforts until the body temperature reaches 101-102°F.
- Do not give the victim fluids to drink.<sup>48</sup>
- Watch for breathing problems until emergency medical personnel arrive on scene or you arrive at the hospital.<sup>49</sup>

**Additional extreme heat preparedness resources:**

- Environmental Protection Agency, [Excessive Heat Events Guidebook](#)
- National Oceanic and Atmospheric Administration, [Heat Safety Resources](#)

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<sup>45</sup> Johns Hopkins Medicine, "Heat-Related Illnesses (Heat Cramps, Heat Exhaustion, Heat Stroke)," [http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related\\_illnesses\\_heat\\_cramps\\_heat\\_exhaustion\\_heat\\_stroke\\_90.P01611/](http://www.hopkinsmedicine.org/healthlibrary/conditions/pediatrics/heat-related_illnesses_heat_cramps_heat_exhaustion_heat_stroke_90.P01611/).

<sup>46</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-3.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-3.asp).

<sup>47</sup> Abderrezak Bouchama, et al, "Cooling and hemodynamic management in heatstroke: practical recommendations," *Critical Care* 11, no. 3 (May 12, 2007): 8.

<sup>48</sup> Centers for Disease Control and Prevention, "Extreme Heat Prevention Guide – Part 3," last updated July 31, 2009, [http://emergency.cdc.gov/disasters/extremeheat/heat\\_guide-page-2.asp](http://emergency.cdc.gov/disasters/extremeheat/heat_guide-page-2.asp).

<sup>49</sup> James L. Glazer, "Management of Heatstroke and Heat Exhaustion," *American Family Physician* 71, no. 11 (June 1, 2005): 2138.