

Preventing and Treating Heat-Related Illness While Living Outside



This zine was largely adapted from the NOLS Wilderness Medicine website on heat-related injuries. It has been edited by SAFE Boulder to include locally relevant information, and to expand the scope to those living outside rather than simply recreating.

What Is Heat Illness?

Heat illness isn't just one thing. It's a spectrum of signs and symptoms that occur when your body's heat production is greater than its heat loss. It's especially common to see heat illness at hot times of the year; in the Boulder area, it's most likely in July and August.

Heat illness is fairly straightforward to prevent with the proper supplies, but it can escalate into a life-threatening condition without proper prevention.

We'll take a look at the causes and signs and symptoms of heat illness, then ways to prevent it.

Causes of Heat Illness

- **High ambient air temperature:** When the air around you is hot, it's harder for your body to lose heat and cool itself by way of radiation.
- **Excessive clothing:** Wearing too much clothing also prevents heat loss.
- **Inability to sweat:** When you sweat and the perspiration evaporates, it cools your body. Being unable to sweat, either due to dehydration or high humidity, can cause heat illness. Sunburns and scars can also reduce your ability to sweat.

Signs, Symptoms, and Treatment of Mild Heat Illness

- **Heat cramps:** Painful muscle contractions that follow exercise in hot conditions.
- **Heat edema:** swelling of extremities caused by dilation of the blood vessels, which allows blood to pool in the extremities under the influence of gravity.
- **Heat syncope:** Fainting due to heat stress. This happens when your body shunts blood to peripheral appendages, which decreases blood flow to the brain.
 - The patient may experience tunnel vision, vertigo, nausea, sweating, weakness, or sudden fainting.

Treatment: Have the patient lie flat in a cool environment and elevate their legs. Keep the patient hydrated and be sure to replenish salt as well as water to avoid hyponatremia (a condition caused by low sodium in the blood). You can also cool the patient by applying cold packs or ice packs in areas with large blood vessels near the skin. The most effective areas are the neck, armpits, groin, and torso.

For heat cramps, gently straighten the muscles. Avoid massaging them, since this could make the cramps worse. For heat edema, compression socks can help if available.

More Serious Heat Illness

Heat Exhaustion and Heat Stroke

- **Heat exhaustion** is a life-threatening rise in body temperature secondary to heat stress. Heat exhaustion is usually caused by a combination of heat stress and dehydration. The boundary between heat exhaustion and **heat stroke** isn't clear—the biggest indicator that a patient has advanced from heat exhaustion to heat stroke is a change in their mental status (they may become disoriented or unresponsive).

Signs and Symptoms

Heat Exhaustion	Heat Stroke
Elevated heart rate	Elevated heart rate
Elevated respiratory rate	Elevated respiratory rate
Skin pale, cool, clammy	Skin pale, warm, clammy
Alert	Altered mental status (disoriented or unresponsive)
Temperature normal or slightly elevated	Temperature higher than 104°F (39.5°C)
Headache, nausea, weakness, tiredness	

Treatment for Heat Exhaustion

- Provide a cool environment by creating shade with a tarp or seeking out shelter.
- Rest and lie flat.
- Hydrate (do not give fluids by mouth until the patient is mentally alert and can hold the glass and drink).

Treatment for Heatstroke

- Cool the patient immediately. Pouring cool water on the patient and fanning them can be effective.
- Immersion in a body of water is the quickest way to cool the patient. Submerge their trunk and extremities. However, beware of summer high flows in Boulder Creek with deceptively strong currents. Ensure the patient's airway is protected and their head remains above water. The patient should never be left alone, as there's a risk of aspiration and drowning.
- This is a life-threatening situation. Seek emergency medical care if at all possible.

Preventing Heat Illness

- **Shade the head and back of the neck** to decrease heat gain from the sun.
- **Hydrate.** Simple indicators of hydration are thirst and the color of your urine. If you are thirsty, drink. Your urine should be clear to pale yellow. Dark urine may indicate dehydration.
- **Wear loose-fitting, light-colored clothing.** This maximizes heat loss by allowing convection and evaporation to take place.
- **Exercise cautiously** in conditions of high heat and humidity. Air temperatures exceeding 90°F (32°C) and humidity levels above 70 percent severely impair the body's ability to lose heat through radiation and evaporation.
- **Recognize the diseases and drugs that impair heat dissipation** (including aspirin, alcohol, and hyperthyroidism).
- **Know the warning signs of impending heat illness**—dark-colored urine, dizziness, headache, and fatigue—and treat the warning signs early on.

Seeking medical care

- Milder symptoms like heat syncope, cramps, and exhaustion can often be treated on your own.
- Immediately seek medical care for anyone exhibiting symptoms of heat exhaustion or heat stroke and associated altered mental status

- You can treat heat illness if you recognize the signs and symptoms early on, preventing it from advancing to heat stroke and becoming a life threat.

Risk factors

People at higher risk of heat-related illnesses include:

- Older adults (65+)
- Infants and children
- People with chronic health conditions
- Pregnant people
- People who work or exercise outside
- People not acclimated to warm temperatures
- People who have already experienced a heat-related illness recently
- People taking drugs or medications that increase heat production or interfere with thermoregulation (including but not limited to alcohol, amphetamines, antihistamines, antipsychotics, benzodiazepines, cocaine, diuretics, laxatives, and tricyclic antidepressants)

Heat illness in pets

Prevention

Pets can overheat long before we do, and unlike people, they don't sweat, and have to rely on panting to cool down. Older pets and brachycephalic dogs may be at higher risk.

To keep your pet safe, provide plenty of water and try to spend time in the shade. Avoid leaving them alone in a car or a tent.

Signs of serious heat illness in pets

- Heavy, excessive panting
- Thick, ropery drool
- Rapid or irregular heartbeat
- Lethargy or weakness
- Incoordination
- Confusion or disorientation
- Vomiting or diarrhea
- Bright red or pale gums
- Collapse or seizures

Cooling your pet

Wet your pet's body with cool water, focusing on the neck, chest, and abdomen. Fan them if possible.

You can also cool a dog with a cold pack in the underarm, but wrap it in a cloth; don't touch it directly to their skin.

Sources

American Animal Hospital Association. Too Hot to Handle: A Guide to Heatstroke in Pets. 2024 Jul 2. AAHA. [accessed 2024 Jul 12]. <https://www.aaha.org/resources/too-hot-to-handle-a-guide-to-heatstroke-in-pets/>.

CDC. 2024 Feb 20. People at Increased Risk for Heat-Related Illness. Extreme Heat. [accessed 2024 Jul 12]. <https://www.cdc.gov/extreme-heat/risk-factors/index.html>.

Lipman GS et al. 2019. Wilderness Medical Society Clinical Practice Guidelines for the Prevention and Treatment of Heat Illness: 2019 Update. Journal of Wilderness & Environmental Medicine. 30(4_suppl):S33–S46. doi:[10.1016/j.wem.2018.10.004](https://doi.org/10.1016/j.wem.2018.10.004).

NOLS Blog. Preventing and Treating Heat Illness. [accessed 2024 Jul 11]. <https://blog.nols.edu/2015/08/11/preventing-and-treating-heat-illness>.

Wasserman DD, Creech JA, Healy M. 2024. Cooling Techniques for Hyperthermia. In: StatPearls. Treasure Island (FL): StatPearls Publishing. [accessed 2024 Jul 12]. <http://www.ncbi.nlm.nih.gov/books/NBK459311/>.



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