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How to Cool Your Body Down During a Hot Summer Day

Analysis by Dr. Joseph Mercola | July 24, 2024

STORY AT-A-GLANCE

- Extreme heat can negatively affect behavior, making people more aggressive, impulsive and prone to poor decision-making. Research shows higher crime rates and increased irritability during hot weather
- Prolonged heat exposure decreases cognitive function. Studies demonstrate that students with air conditioning perform better on tests compared to those without cooling systems
- Heat exhaustion and heat stroke are serious conditions caused by extreme temperatures. Heat stroke occurs when body temperature exceeds 104°F (40°C) and can lead to organ damage
- To cool down quickly, focus on your core by pouring cool water over your body or applying ice to your chest. Targeting hands and feet can also help dissipate heat effectively
- Staying hydrated is crucial in hot weather. Monitor urine color and frequency, and consume water-rich foods like cucumbers, lettuce and watermelon to maintain proper hydration levels

With summer in full swing, it's the perfect time to go outdoors and enjoy hobbies you've been planning to do. But, with summer comes the occasional heat wave, and if you're not careful, it may increase your risk of developing heat-related illnesses.

Moreover, hot weather can affect your behavior. Have you noticed you're becoming grumpier whenever the weather's scorching? That's no coincidence. According to a recent New York Times article,[1] extreme heat can affect your brain, and make you "aggressive, impulsive and dumb," which is why you need to take measures to cool down your body.

Research[2] backs this up, stating that if your body's temperature is higher than normal for prolonged periods, it makes you more irritable and affects your decision-making skills, potentially putting your life in danger.

How Heat Changes Your Behavior

According to the featured article,[3] researchers discovered a link between hot weather and aggressive behavior.[4] After going through crime data, they found that the murders, assaults and domestic violence incidents were higher on hot days. "So-called reactive aggression tends to be especially sensitive to heat, likely because people tend to interpret others' actions as more hostile on hot days, prompting them to respond in kind," the article reports.[5]

But that's not all — nonviolent but aggressive behavior is also more likely to happen during hot weather, such as drivers honking the horn while stuck in traffic. This phenomenon was tested in a study[6] published by the National Bureau of Economic Research.

Researchers selected 1,918 students from two different universities, putting them in either a "hot" room and a "cool" room. Next, the students were asked to complete a series of specialized video games that elicit different behaviors.

After the experiments were completed, researchers noted that higher temperatures increased destructive behavior against other players in an economy-based game. They concluded that hot weather, on a wider scale, may cause a reduction in economic productivity and labor supply.[7]

What seems to cause aggressive behavior in the presence of hot weather? While there are no solid answers yet, there are two theories. According to Kim Meidenbauer, Ph.D., your brain is busy trying to cool down, leaving little energy for higher cognitive functions. "Your tendency to act without thinking, or not be able to stop yourself from acting a certain way, these things also appear to be affected by heat," she explained.

The second one is believed to be a coping mechanism, according to Shaun Morrison Ph.D., a professor of neurological surgery at Oregon Health and Science University. He explains that if you can't find shade or a way to cool down, surviving consumes your energy, making you distracted and irritable.[8]

Your Cognitive Function Goes Down Under Prolonged Heat Exposure

Sweating is your body's way to cool you down, and is mainly composed of water and some salts. Once the sweat reaches your skin and evaporates, your body's temperature lowers.[9] But, once sweating can't keep up with the heat, your wellness becomes compromised, specifically your cognitive function. And if your mind cannot function optimally, the risk of developing heat stroke increases since you're not able to make decisions at your fullest capacity.

In a study[10] published in PLOS Medicine, researchers sought to learn how heat affects humans in an academic setting. For the study, they followed 44 students from Massachusetts during a heat wave in 2016 — 24 of them had air-conditioning (AC) provided, while the remaining 20 didn't. Next, they completed two cognition tests immediately after waking, every day for 12 days.

They discovered that students who had AC had better reaction times compared to those who didn't have AC, and that providing comfortable accommodations for students can help maintain educational performance and subsequent economical productivity.

Another study supports these findings. In one example, published in Indoor Air,[11] 36 participants were exposed to three different temperatures (75.2 degrees F, 78.8 degrees

F and 82.4 degrees F) for four and a half hours in a controlled environment. Afterward, they were observed in various areas such as comfort, mental load and intensity of symptoms experienced.

They were given cognitive tasks as well to measure mental performance under heat. Similar to the PLOS Medicine study, results revealed that elevated temperatures decreased cognitive performance, highlighting the effects of temperature can affect our ability to think.

Heat Exhaustion Versus Heat Stroke — What's the Difference?

A report[12] from Scientific American noted that heat exposure is the top weather-related cause of death in America, killing "more people most years than hurricanes, floods and tornadoes combined." An estimated 1,220 Americans succumb to extreme heat-related conditions every year.[13]

Heat stroke and heat exhaustion are two conditions that may affect people during hot weather, but what do they actually mean? While it's easy to think they're the same, they're different terminologies that fall under the spectrum of heat-related illnesses.

Heat exhaustion is the first complication on the spectrum, manifesting after prolonged exposure to hot environments. Your body temperature is higher than normal, but it's still below 104 degrees Fahrenheit (40 degrees Celsius). According to the U.S. Military Health System, heat exhaustion accounts for most cases of heat-related illnesses.[14]

At the extreme end is heat stroke,[15] which is what happens when heat exhaustion is left untreated. Specifically, heat stroke occurs when your body cannot produce enough sweat anymore to cool itself.[16] As a result, your body's internal temperature rises above 104 degrees F (40 degrees C).[17]

Left untreated, heat stroke can damage your vital organs, leading to kidney and liver failure, brain swelling, metabolic dysfunction and nerve damage. Therefore, it's important that your body does not reach this temperature when spending time

outdoors.[18] The table below gives an overview of the symptoms associated with these conditions:[19,20]

Heat exhaustion	Heat stroke
Dizziness	Disorientation, agitation or confusion
Headache	Hot, dry skin but not sweaty
Nausea	Loss of consciousness
Weakness	Hallucinations
Muscle cramps	Rapid heartbeat
Fatigue	

Four Strategies to Cool Down Your Body

If your job requires you to stay under the sun for extended periods, or if you have planned outdoor activities this summer, learning how to cool yourself or a loved down can be a lifesaver. Since extreme heat can affect cognitive function, it's better to commit these strategies to heart before heading outdoors:[21,22]

- **Cool your core first —** According to Craig Heller, professor of Physiology at Stanford University, our bodies "live close to the thermal edge of life and death." They run optimally at 98.6 degrees F (37 degrees C), and an increase of just a couple degrees can already put us at risk of heat illness.

  To combat heat illness, Heller recommends lowering your temperature by cooling large patches of your skin. And since your torso has the largest surface area of your body, begin cooling there. Ollie Jay, a professor of thermal physiology at the University of Sidney, recommends pouring cool water over your body, covering as much as possible.

Another alternative is wrapping ice with a towel and placing it on your chest one to two minutes at a time for 10 minutes until you feel better. Jay explains the logic behind this:

> *"As the body warms up, it tries to get rid of heat by opening up blood vessels closer to the skin and sending more blood to those areas. This moves heat away from the core toward the surface of the skin, where it can dissipate from the body. Putting cold water or ice on the skin helps speed up this process, and cools down the body more quickly when water evaporates off the skin."*

- **Target your hands and feet —** If you're in a situation where you can't access large amounts of water to cool yourself down, then targeting a limb is the next best alternative, according to Jay.

  Every limb has a specific heat, which equates to the energy needed by your body to cool up or cool down by a degree. Now, why cool down limbs? Because they have large surface areas (large patches of skin) but little mass, and therefore, have lower specific heat. In short, your limbs can cool down faster compared to your torso.

  According to Heller, going for the limbs is a good idea because they're usually hairless, meaning they can heat up and cool down faster. "The palms of your hands and the soles of your feet are radiators," he says. This is mainly because of the large patchwork of blood vessels located in them, which can quickly exchange heat through your blood until you can cool down.

- **Know your limits and seek out help —** If you're overheated, there may not be enough time to cool off your body to negate the effects of extreme heat exposure. Moreover, it's not always apparent when you've reached the tipping point before heat begins to damage your body.

  Your behavior is affected by how hot you're currently feeling, but that may not be a good indicator of your core temperature's heat. Jay says that applying a cold towel

to the face can cool the blood flowing to your brain, tricking your body that it's cooler, but in reality, it's not.

Once you reach this point, it's time to take drastic measures, mainly seeking shade so you can immediately cool down. Getting immediate medical help is also helpful. In addition, certain medications can intensify heat-related complications. If you're taking any of these, be mindful of your time spent in hot environments:[23]

- **Diuretics —** Causes a further decrease in water and electrolytes.
- **Blood pressure medications —** Suppresses thirst, making it harder to know when you need to drink water.
- **Antipsychotics and antidepressants —** Drugs such as haloperidol and olanzapine can affect your ability to sweat.
- **Stimulants —** Amphetamines can increase body temperature.

- **Drink something cold —** Drinking something cold on a hot summer day may be one of the better ways of keeping your body temperature down. According to a study[24] published in the Journal of Sports Sciences, athletes who drank cold drinks lowered their temperatures better compared to ice-cold and room-temperature beverages after exercising outdoors in hot weather.

Stay Hydrated During the Summer to Cool Yourself Down

The summer heat can easily dehydrate you, so it's important to drink adequate amounts of water for a well-functioning body and mind. It' also the foundation of sweat, and if your body can't produce it, your ability to cool down also falls by the wayside.

Since your body can't store water, it needs to be replenished regularly by drinking enough of it.[25] If you don't get enough of water, you'll end up becoming dehydrated. The table below shows the most common symptoms of dehydration:

Mild to moderate dehydration	Severe dehydration
Dry, sticky mouth	Extreme thirst
Sleepiness or tiredness	Irritability and confusion
Dry skin	Sunken eyes
Headache	Dry skin that doesn't bounce back when pinched
Lightheadedness	Low blood pressure
Dizziness	Rapid heartbeat
Few or no tears when crying	Rapid breathing
Minimal urine	No tears when crying
Dry, cool skin	Fever
Muscle cramps	Little to no urination, and urine color is darker than usual
	In serious cases, delirium and consciousness

How much water is enough? The popular guideline ingrained into the public's consciousness is drinking eight 8-ounce glasses (also known as the 8x8 guide) of water, and it's often stated as a scientific fact.

However, hydration is not quite that simple, as many factors affect how much hydration you need for your current situation, such as your age, activity levels and climate. Instead of following the 8x8 guide, a far better strategy is following your thirst to guide your water intake.

Another useful strategy is to monitor the color of your urine and how frequently you're urinating. If your urine is deep, dark yellow, you're not drinking enough water. Ideally, a pale straw or light-yellow color indicates adequate water intake. Also, if you notice that you haven't urinated in a few hours, that's another sign to drink more water. On average, a properly hydrated adult urinates seven or eight times a day.

In addition to drinking water, consider bringing coconut water while you're hiking outdoors. Not only will it hydrate you, it can also help replenish any lost electrolytes you've lost under the sweltering heat.

15 Foods That Can Help You Beat the Heat

Aside from drinking water, did you know you certain fruits and vegetables can also boost hydration? Moreover, these particular foods contain electrolytes that can help replenish minerals lost after sweating a lot. Florida-based dietitian Courtney Smith recommends adding these 15 foods to your diet, based on their water volume and minerals they contain:[26]

Fruits and vegetables	Water volume
Cucumber	96%
Iceberg lettuce	96%
Celery	95%
Radishes	95%
Romaine lettuce	95%
Tomatoes	94%
Zucchini and summer squash	94%

Fruits and vegetables	Water volume
Asparagus	92%
Bell peppers	92%
Cabbage	94%
Cauliflower	93%
Mushrooms	92%
Watermelon	92%
Spinach	92%
Strawberries	92%

Other Strategies to Protect Yourself From Heat-Related Illnesses

In addition to staying hydrated and cooling yourself down, Johns Hopkins Medicine provides additional tips that can help lower your risk of developing health-related illnesses this summer:[27]

- Wear lightweight, loose-fitting clothing in light colors
- Avoid caffeinated beverages and alcohol as they can dehydrate your faster during hot days
- Slowly build up your tolerance to the heat by gradually increasing time spent outdoors
- Take breaks often when partaking in sports activities
- Try to schedule your outdoor activities at cooler times of the day

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