



## We deal with heat the wrong way. At least most of us do. How our bodies can adapt better to the heat:

Reading time: 9 minutes

(Note: This is an update from BrainCandy 107 as a timely reminder of how to better cope with the heat wave)

It is possible to train our bodies to cope better with high temperatures in just a few weeks. I recently read a fascinating [article](#) in the New York Times that turned my intuitive approach to heat waves on its head. And since we can expect more hot days, it makes sense not only to engage in climate activism, but also to better prepare ourselves physically for this future.

The NYT article starts with this short story: In a small, sealed room, Olivia Leach swallowed a 'pill' that would soon monitor her internal temperature. Then she got on a stationary bike and got ready to sweat. As she pedalled slowly, the room began to warm up by one degree every five minutes.

It felt "like a muggy, hot summer day when you're drenched in sweat," said Ms Leach, a PhD student.

Ms Leach works in the lab of Larry Kenney, a professor of physiology and kinesiology at Penn State University. The lab's work is part of a growing body of research looking at how the body deals with heat and how to help people acclimate to hotter weather.

### There are more heat-related deaths

This type of research has become more urgent as more parts of the world face an increasing number of dangerously hot days. In the United States alone, extreme heat caused at least 2,302 deaths in 2023.



Source: istockphoto.com: humonia

In 2023, German Health Minister Karl Lauterbach warned that there had been 8,000 heat-related deaths in Germany and that he would endeavor to halve this figure. After that, however, I heard nothing more about it. As is so often the case with the announcements of the previous government. Minister Lauterbach did not cite any reliable sources, perhaps he just wanted to get on the climate activists' PR bandwagon quickly. Lauterbach's proposed solutions follow the zeitgeisty Berlin idea of the underage citizen who needs the nanny state for everything:

- # drink enough water
- # stay in the shade
- # eat light food
- # keep your home cool
- # avoid exertion
- # look after yourself and others

Americans take a refreshingly more active approach to the problem. Without proper preparation, overexerting the body in extreme heat can be deadly. According to the Occupational Safety and Health Administration,



nearly half of all heat-related worker deaths occur on the first day of working outside in intense heat, and more than 70 percent occur within the first week. Recognizing these risks, the Biden administration has proposed new regulations to protect workers who work in the heat.

Under the proposal, workers would be eligible for so-called acclimatization plans, which would allow new workers who are not used to high temperatures to safely adapt to the heat by gradually increasing their working hours. This is help for better resilience, instead of Lauterbach's passive protective behavior.

"Heat is stress, and our bodies adapt to stress when we are repeatedly exposed to it," says William Adams, a kinesiologist at the University of North Carolina.

Heat acclimatisation is often used to help people who regularly engage in intense outdoor activities, such as athletes, outdoor workers and military personnel. As temperatures rise, people can benefit from trying to increase their heat tolerance.

"Start exercising in the fresh air, expose yourself to heat and work your way up," says Michael Sawka, associate professor of biological sciences at the Georgia Institute of Technology, who has studied heat acclimatization. "You'll find that your heat tolerance increases."

### **The benefits of adapting to the heat**

When it's hot, our bodies look for ways to cool down. You start to sweat, and your heart starts pumping harder. But extreme heat can make the heart beat too hard. Blood pressure can start to drop. You can sweat so much that you become dehydrated or dizzy.

The idea behind acclimatization is to train our bodies to cope better with the heat, starting with small doses. You could start by doing half an hour of light or moderate exercise in the heat for a few days, followed by an hour over the next few days. Gradually increase to more intense activity in higher heat and for longer periods of time. Generally, two weeks of daily heat exposure with 60 to 90 minutes of physical activity is sufficient for the body to acclimatize to the heat.

The body learns to regulate its core temperature better and better. The total water content in the body increases and the blood plasma expands. This means that the heart fills up faster, and no longer has to beat as often to transport oxygen. In addition, more blood can flow towards the skin, where it can be cooled.

Over time, you sweat earlier and more. This helps the body to stay cooler for longer in hot weather. You also store more salts, which means that fewer electrolytes are lost through sweat. In addition, the body produces more heat shock proteins, which help to protect against and relieve heat stress.

Some of these effects can be seen after just a few days.



istockphoto.com: elenaleonova

Source:

### **How to acclimatize**

What this process looks like depends on your state of health, fitness level and your heat requirements.



The body adapts to the strain you place on it. Light exercise in dry heat, for example, only acclimatizes you to light exercise in dry heat.

"You can adapt by only exposing yourself to the heat when you're resting, but you won't achieve the same adaptation as when you're physically active in the heat," said

Dr Sawka. "You don't want to overdo it. But you should acclimatize so that it's not harmful to your body when you're exposed to it."

And although acclimatization can make it easier to cope with hot days, everyone has a limit, Ms Leach said. "There's an upper limit to how much you can acclimatize".

If you're able to increase your heat tolerance, working in hot temperatures one or two days a week should help your body maintain its adaptations, Dr Adams said.

Without regular heat exposure, however, the effects will wear off after about a month. However, the body remembers some of the adaptations, which should make it easier to acclimatize next time.

I'm travelling to southern Italy in a few weeks' time, where there is currently a heatwave. I will consciously prepare myself for the next time. Until now, I've always complained about my gym being too hot in summer. Now I'm using it with a smile. If it's still hot in Puglia, I'll prioritize daily exercise sessions once I arrive to acclimatize further.

I probably should have written somewhere in this BrainCandy: "Ask your doctor or pharmacist" before you just start self-motivated, but I'm talking to smart people who don't need the nanny state, right? And one more thing, the New York Times article negates the helpful support of our adaptation to the heat by regularly taking electrolytes. If you don't eat a diet primarily of highly processed foods with high salt content, then you can boldly reach for appropriate

supplements that replenish salt and other electrolytes. I love LMNT (pronounced: *Element*) - but unfortunately, it's currently difficult to get hold of in Europe. But Amazon and the like offer a huge selection for athletes, so there's something for everyone.

## Added in June 2025

It's not just the body that adapts; our brain also plays an important role in heat adaptation. Because there are new neurobiological findings: The brain as a "thermostat" Breakthrough from Heidelberg (December 2024):

Researchers at Heidelberg University have been able to show for the first time that a specific group of heat-sensitive nerve cells in the hypothalamus is largely responsible for adapting to heat.

In mice that were kept at 36 °C for 30 days, these cells were permanently active and significantly increased heat tolerance.

If these nerve cells were artificially deactivated, the animals immediately lost their adaptation.

Conversely, non-acclimatized mice could be made heat-tolerant within a few days by specifically activating these neurons.

Implication for us humans:

The brain is also likely to play a central role in acclimatization in humans - an exciting starting point for future interventions, for example through targeted neuro-training, which presumably goes hand in hand with physical adaptation, or pharmacology.

And there was another personal approach I didn't mention at the first BrainCandy. I also like to go to the sauna on hot weekends. The sauna areas are not so crowded and afterward you can enjoy the sun in the outdoor facilities and realize that your heat tolerance has increased after the sauna.



## Book recommendation

By Ralph Ohnemus, Uwe H. Lebok, Florian Klaus:

### Context marketing

The key to consumer behaviour to [order](#).



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