Off Your Mental Game?
You Could Be Mildly Dehydrated

Unless you replenish fluids, just an hour's hike in the heat or a 30-minute run might be enough to get mildly dehydrated, scientists say.

Was it hard to concentrate during that long meeting? Does the crossword seem a little tougher? You could be mildly dehydrated.

A growing body of evidence finds that being just a little dehydrated is tied to a range of subtle effects — from mood changes to muddled thinking.

"We find that when people are mildly dehydrated they really don't do as well on tasks that require complex processing or on tasks that require a lot of their attention," says Mindy Millard-Stafford, director of the Exercise Physiology Laboratory at Georgia Institute of Technology. She published an analysis of the evidence this month, based on 33 studies.

Heat Making You Lethargic? Research Shows It Can Slow Your Brain, Too

How long does it take to become mildly dehydrated in the summer heat? Not long at all, studies show, especially when you exercise outdoors.

"If I were hiking at moderate intensity for one hour, I could reach about 1.5 percent to 2 percent dehydration," says Doug Casa, a professor of kinesiology at the University of Connecticut, and CEO of the Korey Stringer Institute.

For an average-size person, 2 percent dehydration equates to sweating out about a liter of water.
"Most people don't realize how high their sweat rate is in the heat," Casa says. If you're going hard during a run, you can reach that level of dehydration in about 30 minutes.

And at this level of dehydration, the feeling of thirst, for many of us, is only just beginning to kick in. "Most people can't perceive that they're 1.5 percent dehydrated," Casa says.

The Salt

Still Thirsty? It's Up To Your Brain, Not Your Body

But already there are subtle — maybe even imperceptible — effects on our bodies and our mental performance.

Take, for example, the findings from a recent study of young, healthy and active women who agreed to take a bunch of cognitive tests and also agreed to restrict their fluid intake to no more than 6 ounces for one day.

"We did manage to dehydrate them by [about] 1 percent just by telling them not to drink for the day," says Nina Stachenfeld, of the Yale School of Medicine and the John B. Pierce Laboratory, who led the research.

The women took one test designed to measure cognitive flexibility. It's a card game that requires a lot of attention, since the rules keep changing throughout the game.

"When the women were dehydrated they had about 12 percent more total errors" in the game, says Stachenfeld.

She repeated the tests after the women drank sufficient water, and their performance improved. "We were able to improve executive function back to normal — in other words, back to the baseline day — when they rehydrated," the scientist says.

Dehydration didn't hamper performance on all the tests; the women's reaction time, for example, was not impeded. The decline was seen during the complicated tasks.
Though the study was small, and funded by PepsiCo, which sells bottled water, Stachenfeld designed the methods and completed the analysis independently. And other scientists say her findings fit with a growing body of independent evidence that points to similar conclusions.

"I absolutely think there could be big implications of having a mild cognitive deficiency with small amounts of dehydration," Casa says.

If you're a student, for example, a 12 percent increase in errors on a test might matter. And whether you're a pilot, a soldier, a surgeon or a scholar, many daily tasks depend on the ability to be precise and pay attention.

For anyone trying to do their best work, the findings raise a number of questions:

**How much water do we need?**

There are no exact daily requirements, but there are general recommendations.

**Your Health**

**Athletes Run Risk of Overhydrating**

A panel of scholars convened several years ago by the National Academies of Sciences, Engineering and Medicine concluded that women should consume, on average, about 91 ounces of total water per day. For men, the suggested level is even higher (125 ounces).

Note that this total includes water from all sources, including food and other beverages, such as coffee and tea. Typically, people get about 20 percent of the water they need daily from fruits, vegetables and other food.

Also, water needs vary from person to person. For example, body weight and muscle mass matter. Also, physical activity and heat exposure can increase the amount of fluid a person needs.

**How can you tell if you're dehydrated?**

One easy test: The color of your urine is a good guide. As a general rule of thumb, the darker the color, the more likely you are to be dehydrated. Aim for shades that have been described as "pale lemonade" or "straw." A color chart developed by physiologist and University of Connecticut professor Lawrence Armstrong can be a helpful guide, researchers say.

**Are older people more vulnerable to dehydration?**

As we age, we're not as good at recognizing thirst. And there's evidence that older adults are prone to the same dips in mental sharpness as anyone else when mildly dehydrated.

Don't wait until you're thirsty. A good rule of thumb is to sip fluids throughout the day. No need to chug huge amounts at one time; there are some risks to overhydrating, too.

**Can coffee, tea and other caffeinated drinks have a dehydrating effect?**
The most recent evidence finds that coffee provides similar hydrating qualities to water. In other words, yes, your morning cup of joe — or whatever caffeinated beverage you fancy, can help to keep you hydrated.

As we reported in 2014, people who routinely drink coffee or tea develop a tolerance to the potential diuretic effects of caffeine.

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