How to calm your mind with breathing, according to science

Breathwork practices and slowing our breath can alleviate stress and improve mood.

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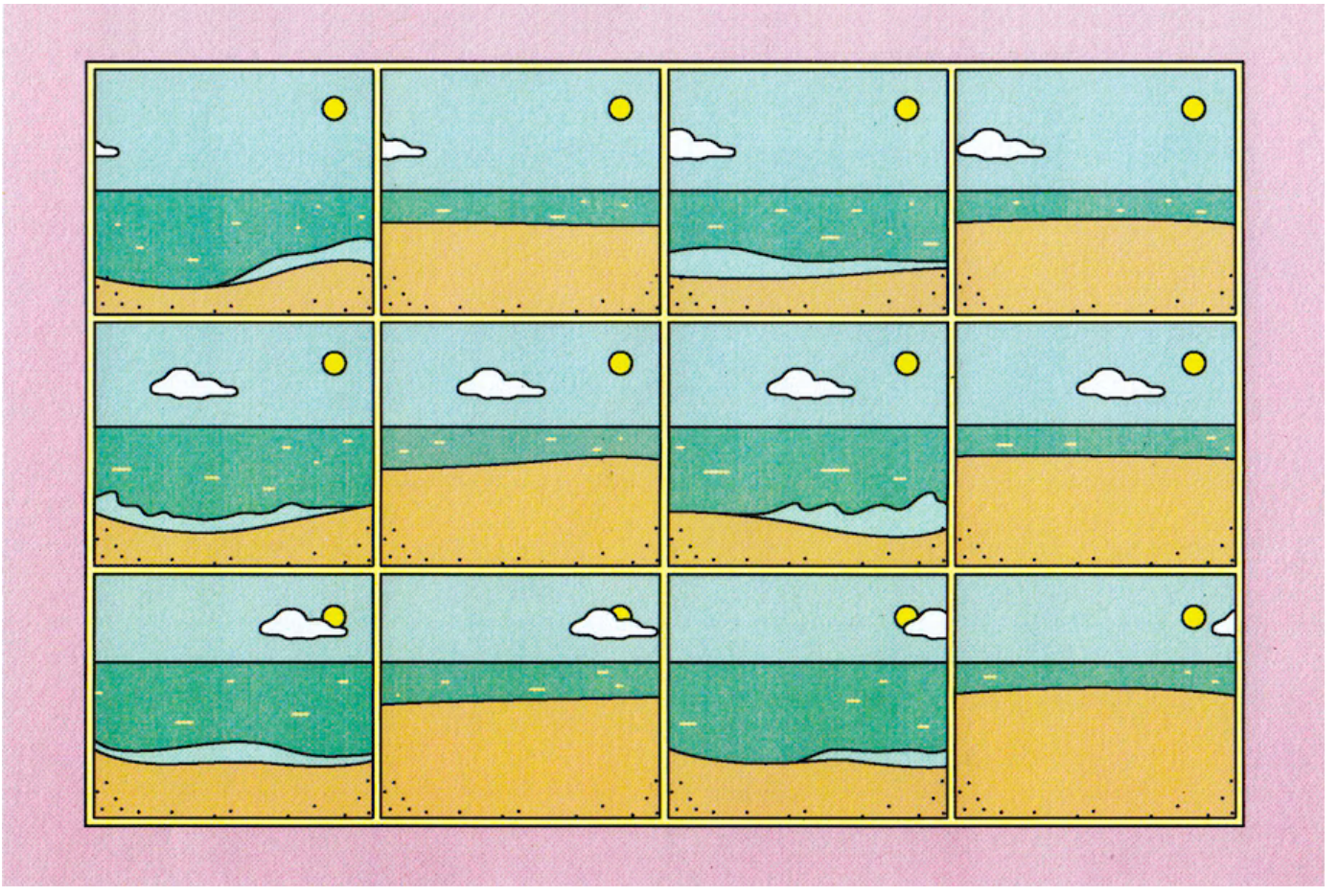

(George Wylesol for The Washington Post)

Now exhale and notice how you feel.

If you feel even a bit calmer, you have just experienced the power of conscious and intentional breathing.

Research shows that breathwork practices and slowing our breath can alleviate stress and improve mood by harnessing the often subtle but profound influence our breathing has on how we think, feel and behave.

Our "breath accompanies us from birth until death," said Helen Lavretsky, a geriatric integrative psychiatrist at the University of California at Los Angeles and director of research for the Integrative Medicine Collaborative. As a result, breathing is "an immediate tool available to a human being to self-regulate emotions."

Breath, body and brain aligned

The relationship between our breath, body and brain has been known for at least 1,500 years, said Paul Dallaghan, a breathwork expert and researcher who is publishing a review on the history of yoga. "One reflects the other. As the breath moves, the mind moves," he said, citing yoga texts.

More recent research has found evidence supporting this ancient insight.

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With every inhale, the pupils in our eyes tend to dilate, our reaction time quickens and our ability to remember and recall information becomes more efficient. At the same time, our response to emotional information heightens, and we are also less likely to make a voluntary movement.

And when we exhale, the opposite happens.

The neural activity in brain regions important for emotion oscillates with each cycle of breath.

The neurons responsible for generating breathing are found in the brain stem in what is known as the preBötzinger complex. Though they number just 10,000 in humans, breathing-related neural rhythms are found throughout the brain, said Jack Feldman, chair of the neuroscience department at the University of California at Los Angeles and the researcher who discovered and named this area.

Breathing couples with activity in the hippocampus, a key region for memory, while we sleep and while we are awake. Breathing also entrains the neural activity in brain areas important for emotion and cognition, such as the prefrontal cortex and amygdala.

We already use this unconsciously. Before a big exam, race or presentation, we take a deep breath.

“It’s relaxing,” said Feldman, who co-wrote a 2022 review on

the relationship between breathing and emotion.

Breathing slow and breathing right

Most people breathe an average of 12 to 20 times a minute, though the rate varies from person to person and circumstance to circumstance. More anxious people tend to breathe faster.

However, the "magic number" of calming breaths is around 5.5 to 6 breaths per minute — far slower than most people hit, Dallaghan said. This number comes from observations of people in meditative states — moments of calm, quiet and clarity when breathing would spontaneously slow.

Slowing down our breath may help to rebalance our autonomic system away from a sympathetic "fight-or-flight" mode toward a parasympathetic "rest-and-digest" one, said Guy Fincham, an associate researcher at Brighton and Sussex Medical School interested in "all things breathwork."

Breathing sends signals from our body to our brain through the vagal nerve, and slower and deeper breaths activate the nerve more potently, Lavretsky said. "When the vagal nerve activates, it's like a big red sign," she said. "When all systems stop, you stop worrying."

Because we have the power to consciously change our

breathing pattern, we can influence how we think and feel.

“I feel like if everybody on Earth takes a breath before reacting, it would be a much more peaceful place,” Lavretsky said.

Making breathwork work

Breathwork involves the intentional control of breathing rate, depth and pattern as we use our higher cortical brain areas to override our unconscious breathing pattern in the brain stem

A recent study reported that even just five minutes of breathwork each day for about a month could reduce breathing rate, improve mood and reduce anxiety. A 2023 review found that breathwork could help adults with clinically diagnosed anxiety disorders with their symptoms while other research has found breathing interventions helped patients with depression.

In a 2023 meta-analysis of 12 randomized controlled trials on breathwork, Fincham and his colleagues reported that breathwork was associated with lower levels of stress as well as self-reported depressive and anxiety symptoms, though he notes many of these studies were relatively small in sample size and had weak control groups.

It is possible that the mental health benefits of breathwork arise from a placebo effect: You think breathing with intentionality makes you feel better, and so it does.

But new research from Feldman and his colleagues suggests that slow breathing may have profound effects on emotion — in mice.

In the study, which is a preprint and not yet peer-reviewed, researchers artificially induced mice to breathe more slowly for 30 minutes a day over four weeks. Afterward, when the mice were placed in a fearful condition they had experienced before, they were noticeably calmer and froze less than control mice that did not have the slow breathing sessions.

“Our conclusion is that breathwork is not a placebo response. It may be present in all mammals,” Feldman said. “And we may be the only species that takes advantage of it.”

How to breathe better

We can do breathwork almost anytime and anywhere. Here are some tips from experts on breathing better for a calmer mind.

Sit firmly in a chair with both feet planted on the ground. It is important to set up the “infrastructure for the breath to work easier,” Dallaghan said.

Take a soft and smooth breath.

Take a good exhale and then a free inhale, Dallaghan said. Let the breath become soft and smooth with as little effort as possible.

“Be kind to yourself and realize that it might be hard in the first instance to learn it, but just relax into it” since the “whole point is that you’re relaxing and inducing calm in the body,” Fincham said.

Breathe through your nose.

The nose filters the air, humidifies it and regulates its temperature.

Nasal breathing may also have a larger impact on the autonomic system that makes it more calming, Dallaghan said.

Some research suggests that nasal breathing may be more effective than oral breathing for some behaviors such as visuospatial performance and memory recall.

Mindfulness of your breath is important “because you have to become aware of it to control it,” Fincham said.

Place a hand on your belly above the navel, which would be just above the diaphragm, Dallaghan said. Feeling the

movement of the abdominal muscles as you breathe gives a "reflection" of the movement of your diaphragm.

If you feel the breath only up in your chest, "there's a good chance your breath didn't go deep enough," Dallaghan said

Try different breathing patterns.

Box breathing involves equal time spent inhaling, holding, exhaling and holding, with each step lasting three or four seconds.

Four-seven-eight breathing extends the duration: Breathe in for four seconds, hold for seven and breathe out for eight.

Cyclic sighing involves inhaling slowly and then inhaling again to fully fill the lungs before slowly exhaling.

Other practices such as yoga and meditation can also slow down the breath.

While breathing slowly even five to 10 minutes a day can help, longer sessions can be even more beneficial.

"You kind of hit a golden zone of 20 to 30 minutes of regular breath practice," Dallaghan said. "Then it has a more transforming effect physiologically."

Consider seeing a breath coach or facilitator.

To ensure you are practicing breathwork properly and to see if there are bad breathing patterns such as overbreathing or tension, Fincham and Dallaghan said, learn from a breath coach or facilitator.

With breathing, "we can tap into our own capacity for healing," Fincham said. And, once you've learned how to do it properly, "that's yours forever."

Do you have a question about human behavior or neuroscience? Email BrainMatters@washpost.com and we may answer it in a future column.