



New Study Finds a Simple Breathing Exercise May Help Decrease Alzheimer's Risk

By Megan Edwards
2023-06-07 10:23:48



Can you breathe your way to a healthier brain? Researchers at the USC Leonard Davis School of Gerontology have found intriguing new evidence that [deep, intentional breathing](#) could reduce your risk of developing [Alzheimer's disease](#)—regardless of your current age.

[The study](#), published recently in *Nature Scientific Reports*, measured the amount of two amyloid-beta peptides in the bloodstream of participants at the beginning and end of a four-week intervention. Elevated levels of these peptides in the brain are believed to trigger the onset of Alzheimer's disease and are often associated with excessive stress or sleep deprivation.

To measure the impact of behavioral changes on peptide buildup, the researchers randomly divided 108 healthy adults into two groups and instructed them to practice one of two stress-reduction techniques for 20-40 minutes, twice a day, for four weeks. Each participant wore a heart rate monitor that was attached to a biofeedback machine so they could see their heart rate displayed on a laptop. One group was asked to think of soothing imagery and try to maintain a steady heart rate for the duration of their sessions. The other group was told to match their breathing to an on-screen pacer graphic that guided them to slowly inhale and exhale for matching counts based on the breathing pattern that induced the greatest heart rate variability for each participant.

At the end of the study, researchers discovered the group

who participated in timed breathing had significantly lower levels of both peptides in their blood than when the research began. The decrease was consistent among participants in the timed breathing group irrespective of age, which may indicate that behavior-based Alzheimer's prevention techniques can be effective at any stage of life.

The Head and the Heart

So why might slow, timed breathing have such a profound effect on peptide buildup? Researchers posit that strong heart rate variability—that is, the small fluctuations in time between each heart beat—is crucial for maintaining a healthy body and mind as you age.

Let's break it down: Your autonomic nervous system is constantly adjusting your heart rate and breathing patterns based on what is going on around you (e.g., if you're hiking and see a bear, your heart rate picks up so your body is primed to flee danger). Two branches of the autonomic nervous system, known as sympathetic and parasympathetic, are associated with distinct heart rate and breathing patterns. When your sympathetic nervous system is engaged (aka fight-or-flight mode) the time between your heartbeats remains relatively constant and you breathe more rapidly. When the parasympathetic nervous system is switched on (aka rest-and-digest mode) the time between your heart beats fluctuates, getting shorter as you inhale and longer when you exhale. Long deep breaths induce greater heart rate variability and signal to your brain that you're safe, which allows your nervous system to slide in the parasympathetic state more easily.

The study authors point out that as you age your heart rate variability weakens, which means it's harder to access the restorative state of your parasympathetic nervous system. In fact, [a 2020 study](#) that analyzed smart watch data found heart rate variation drops by up to 80% between the ages of 20 and 60.

“We know the sympathetic and parasympathetic systems influence the production and clearance of Alzheimer's-related peptides and proteins,” says lead study author Mara Mather, who directs the Emotion & Cognition Lab

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at the Leonard Davis School of Gerontology.
“Nevertheless, there’s been very little research on how these physiological changes in aging might be contributing to the factors that make it conducive for someone to develop Alzheimer’s disease or not.”

Maintaining access to your parasympathetic nervous system, and thus heart rate variability, may be key when it comes to having a healthy brain as you get older. And just as doing bicep curls builds up the muscles in your arms, practicing conscious breathing can help increase heart rate variability so your nervous system remains capable of downregulating.

Exercise: Breathe for Better Health

Curious to try the breathing exercise from the study? While this isn’t the exact graphic used by the research participants, the video below follows the same breathing pattern outlined by the researchers and can provide a good bite-size starting point for your own routine.