

NIH-Funded Study: Brain Chemistry Breakthrough to Reverse Cognitive Aging *Shows Gains in Key Chemical Known to Decline with Aging and Alzheimer's*

San Francisco, October 14, 2025 (GLOBE NEWSWIRE) — A [new peer-reviewed brain imaging study](#) shows a novel intervention can significantly upregulate the production of a key brain chemical — acetylcholine (sometimes called the “pay attention” chemical)— known to decline with normal cognitive aging and to fall precipitously with Alzheimer’s disease and related dementias (ADRD). This breakthrough has large implications for reversing cognitive aging, and preventing (or reversing) pre-dementia, and dementia. The intervention used in the study was [BrainHQ](#) brain exercises developed by [Posit Science](#), and examined as part of an NIH-funded study in collaboration with independent researchers at McGill University.

For decades, the most prescribed medication for ADRD has been cholinesterase inhibitors (such as Aricept®), which artificially flood the brain with acetylcholine—typically, with a short-term benefit—rather than fixing its downregulated production.

“This is a really big deal,” noted Dr. Henry Mahncke, CEO of Posit Science, which makes the online BrainHQ exercises and assessments. “While we have known for some time, based on animal studies, that brain chemical systems are ‘plastic’ — capable of change and improvement — this is the first confirmation in humans of an intervention that can up-regulate the production of key brain chemicals, even months after the subjects engaged in the training. It’s the culmination of work in the science of brain plasticity posited by renowned neuroscientist Dr. Michael Merzenich in the 1980s, and advanced by a global team of hundreds of research collaborators.”

[The McGill study found](#) 10 weeks’ use of the game-like app BrainHQ by older adults (for 30 minutes a day) significantly upregulated the chemical system in the brain which produces acetylcholine (the “cholinergic system”), as compared to the control group which trained on ordinary computer games.

“The training restored cholinergic health to levels typically seen in someone 10 years younger,” said senior author [Dr. Etienne de Villers-Sidani](#), an Associate Professor in McGill’s Department of Neurology and Neurosurgery and neurologist at The Neuro (Montreal Neurological Institute-Hospital). “This is the first time any intervention, drug or non-drug, has been shown to do that in humans.”

“A lot of people assume crossword puzzles or reading are enough to keep the brain sharp. But not all activities truly promote neuroplasticity,” said de Villers-Sidani. “The program is already commercially available, making it an option for clinicians to discuss with patients interested in supporting brain health.”

This study offers a biochemical explanation of prior findings from other studies showing that BrainHQ exercises reduce dementia [risk](#) and [incidence](#) and improve many standard measures of cognitive function ([attention](#), [speed](#), [memory](#), [executive function](#)) and of gerontological life function ([maintaining independence](#), [driving safety](#), [fall risk](#), [general](#)

[health, healthcare costs](#)) in older adults. The finding of an improvement in acetylcholine production sufficient to offset about a decade of decline is also consistent with a [prior study](#) of BrainHQ, indicating that there was an average of about 10 years improvement in attention and memory among older adults, using a standard age-stratified assessment.

In their report, the researchers say this training could offer a lower-risk alternative to medication or be used alongside it.

“This study also demonstrates a new non-pharmacological path for addressing a host of conditions associated with deficits in brain chemistry,” Dr. Mahncke observed. “That may include not just cognitive aging, but also pre-dementia, Alzheimer’s, Parkinson’s, schizophrenia, bipolar, ADHD, anxiety, stress, fatigue, sleep disorders and other mental health issues. It’s another indication that brain exercise, like physical exercise, can play an important role in overall health and lowering of risk for chronic diseases.”

“More simply put, this could lower health care costs over time by trillions of dollars,” Dr. Mahncke added.

BrainHQ exercises have shown [benefits in more than 300 studies](#). Such [benefits include](#) gains in cognition (attention, speed, memory, decision-making), in quality of life (depressive symptoms, confidence and control, health-related quality of life) and in real-world activities (health outcomes, balance, driving, workplace activities). BrainHQ is used by leading health and Medicare Advantage plans, by leading medical centers, clinics, and communities, and by elite athletes, the military, and other organizations focused on peak performance. Consumers can try a BrainHQ exercise for free daily at <https://www.brainhq.com>.

This research was supported by the National Institute on Aging of the National Institutes of Health under Award Numbers R44AG039965 and 3R44AG039965-06S1. This content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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