Decades later, brain training lowers dementia risk

February 9, 2026
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GAINESVILLE, Fla. — Beginning in the late 1990s, nearly 3,000 older adults received brain training as part of a study to evaluate the training's effect on thinking and memory. Twenty years later, participants continued to reap the benefits.


Older adults who participated in computer-based cognitive speed training had a lower risk of being diagnosed with dementia two decades later. (Adobe Stock photo)

In the latest follow-up from the Advanced Cognitive Training for Independent and Vital Elderly, or ACTIVE, study, investigators report that participants who received cognitive speed training, plus booster sessions one and three years later, were 25% less likely to be diagnosed with dementia in the next two decades.

Researchers say it is one of the first results from a large randomized, controlled trial to demonstrate that any intervention, whether it is cognitive training, brain games, physical exercise, diet or drugs, can lower the incidence of Alzheimer's disease and related dementias. Findings appear in the journal Alzheimer's & Dementia: Translational Research and Clinical Interventions.

Previous studies of the ACTIVE training had shown participants maintaining improvements at five and 10 years after training, but seeing benefits this long-lasting was a surprise even to Michael Marsiske, Ph.D., one of six study principal investigators and a professor and interim co-chair of the Department of Clinical and Health Psychology at the University of Florida College of Public Health and Health Professions.

"Participants who had the greatest advantage had a maximum of 18 training sessions over three years. It seemed implausible that we might still see benefits two decades later," Marsiske said. "Our initial findings had shown benefits of several training arms up to 10 years after training, with participants reporting fewer impairment in tasks of daily living and experiencing fewer motor vehicle crashes. Adding in these 20-year findings strongly suggests that engagement in cognitive training does no harm and may confer substantial benefit."

The researchers believe the impacts from the cognitive speed training were the most durable because the training was adaptive and personalized.

Funded by the National Institute on Aging and the National Institute of Nursing Research, the multisite ACTIVE study involved 2,832 older adults who were randomly placed in groups for 10 training sessions in memory, reasoning or speed of processing. Training was conducted in 60- to

75-minute sessions over about six weeks. Some participants were randomly selected to receive booster training 11 and 35 months following the initial training. A control group received no training.

After five years, participants in all trained groups retained benefits. Participants reported less difficulty performing tasks such as cooking, taking medication and managing finances than their peers in the control group. Ten years on, researchers found that participants who received training in reasoning and speed of processing maintained cognitive improvements.

For the 20-year follow-up — those still living were now mostly in their 90s — the investigators reviewed participants' medical records to determine how many had been diagnosed with dementia. Those in the speed training group had cut their risk of dementia by one-quarter compared with participants in the control group.

The speed training requires participants to process visual information on a computer screen and make quick decisions. As participants' speed and accuracy improved, the training got progressively more difficult. Speed training may cause physical changes to the brain, leading to new and stronger connections between brain networks. The speed training used in the study is now available through the company BrainHQ.

For those interested in incorporating cognitive training into their own health practice, it's never too late to begin, said Marsiske, who is also the leader of the Data Management and Statistics Core of the 1Florida Alzheimer's Disease Research Center.

"At enrollment, our participants ranged in age from 65 to 94 years," he said. "We found no substantial reduction of training benefit with age, suggesting that training can be started at any time."

The ACTIVE study has inspired the investigators to launch follow-up trials, develop new interventions and explore how older adults may benefit from pairing cognitive training with other lifestyle habits such as physical exercise, nutrition and hypertension management.

"We think this study encourages us, and the field, to continue incorporating cognitive training into multicomponent intervention programs for older adults," Marsiske said.

In addition to Marsiske, study authors include corresponding author Marilyn Albert, Ph.D., of Johns Hopkins Medicine; Norma Coe, Ph.D., Chuxuan Sun and Elizabeth Taggert, of the University of Pennsylvania; Katherine Miller, Ph.D., Alden Gross, Ph.D., and George Rebok, Ph.D., of the Johns Hopkins Bloomberg School of Public Health; Richard Jones, Ph.D., of Brown University; Cynthia Felix, M.D., of the University of Pittsburgh; Karlene Ball, Ph.D., of the University of Alabama at Birmingham; and Sherry Willis, Ph.D., of the University of Washington.