

Study: Specialized brain training may forestall dementia onset for years

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Diagram of the brain of a person with Alzheimer's Disease. Credit: Wikipedia/public domain.

If you're intent on keeping dementia at bay, new research suggests you'll need more than crossword puzzles, aerobic exercise and an active social life. In a study released this week, researchers found that older adults who did exercises to shore up the speed at which they processed visual information could cut by nearly half their likelihood of cognitive decline or dementia over a 10-year period.

The new clinical trial results, presented Sunday at the Alzheimer's Association's International Conference in Toronto, establish specialized brain training as a potentially powerful strategy to prevent Alzheimer's

disease and other afflictions, including normal aging, that sap memory and reduce function.

With 76 million baby boomers reaching the age of maximum vulnerability to Alzheimer's and with no effective treatments available to alter the disease's progression, researchers are keen to find ways to prevent or delay the onset of the memory-robbing disease. The new research suggests that even years after it is administered, an inexpensive intervention without unwanted side effects might forestall [dementia](#) symptoms.

The latest results emerged from a 10-year study that compared the effects of three forms of brain training in a group of 2,802 cognitively healthy seniors. The ACTIVE study - short for Advanced Cognitive Training for Independent and Vital Elderly - was funded by the National Institute on Aging.

A quarter of the participants, who had an average age of 73.4 at the study's start, got no training at all. The remaining participants were divided into three groups, and over five weeks, each group got 10 hourlong training sessions. One group got a classroom-based course designed to impart strategies aimed at boosting memory; a second got a classroom-based course designed to sharpen participants' reasoning skills.

A third group was given computerized training designed to increase the speed at which the brain picks up and processes cues in a person's field of vision. Speed of visual processing is a cognitive skill that declines with age, a trend that some neuroscientists attribute to the increasing "noise" in electrical communications between cells and among regions in the brain.

Over the study's 10-year follow-up, 14 percent of participants in the

control group suffered significant [cognitive decline](#) or dementia, compared with 11.4 percent in the memory-strategies training group, 11.7 percent in the reasoning-strategies training group and 10.5 percent in the speed-of-processing group. Cognitive decline or dementia was not only less among those in the speed-of-processing group; when it appeared, it came later.

Statistically, the trial's four groups experienced sizable differences in [cognitive aging](#). For those who got the commercially available brain-training exercises, the cumulative risk of developing cognitive decline or dementia over 10 years was 33 percent lower than for participants who got no training at all. Among a smaller group of computerized-training participants who got "booster sessions" - at least one refresher class 11 and 35 months after the initial training - the risk of cognitive decline or dementia went down even further. Compared to study participants who got no training at all, recruits who went through more than 10 of the computerized brain-training sessions were 48 percent less likely over 10 years to experience dementia or cognitive decline.

Participants who took part in the other two training regimens, which focused on teaching strategies for remembering and for reasoning, were as a group slightly less likely than the control group to suffer cognitive decline or dementia over the study's 10-year span. That was particularly true for those who got 10 sessions to improve reasoning-strategies. But the results of those training regimens were less robust than those for the computerized training, and researchers could not rule out the possibility they were caused by chance.

In the ACTIVE trial, participants' cognitive health was measured at one, two, three, five and 10 years after initial training took place, using several standardized batteries. Researchers gauged participants' mood, confidence and self-rated health, and surveyed their ability to conduct such daily tasks as preparing meals, driving and taking care of finances.

The computerized brain-training exercise is commercially available as the "Double Decision" game, one of a suite of cognitive exercises marketed online by the San Francisco-based Posit Science Corp. The game exercises an individual's ability to detect, remember and respond to cues that appear and disappear quickly in varying locations on a computer screen. It uses colorful graphics and challenges players with escalating difficulty as their proficiency increases.

In an interview, University of California, San Francisco neuroscientist Michael Merzenich, chief scientific officer of Posit Science, said that the seemingly narrow skill of processing visual cues appears to be a pretty good indication of a person's overall cognitive health. The new study suggests that when visual processing skills are improved by programs designed to build up those mental "muscles," people not only perform better in tests of that specific skill, they get better at a wide range of complex behaviors, he said. The cognitive benefits, in short, appear to be "generalized."

For companies marketing computer-based brain-training programs, now a multimillion industry, claims of such generalized cognitive benefits have generated criticism and controversy. In 2014, neuroscientists gathered under the auspices of the Stanford Center on Longevity took the brain-training industry to task for promising results that were "frequently exaggerated and at times misleading."

Though such exercises can produce performance improvements in the lab, they wrote, "these small, narrow and fleeting advances are often billed as general and lasting improvements of mind and brain." Despite bold marketing claims, "compelling evidence of general and enduring positive effects on the way people's minds and brains age has remained elusive," they wrote in a December 2014 consensus statement.

University of South Florida associate professor Jerri Edwards, first

author of the new study, said the ACTIVE study's findings appears to be a milestone - "the first time a cognitive training intervention has been shown to protect against cognitive impairment or dementia in a large, randomized, controlled trial."

Among the study's most intriguing findings, said Edwards, was the suggestion that with continued [brain training](#) - an increased dose - older people might further boost their protection against dementia.

"Next," she said, "we'd like to get a better grasp on what exactly is the right amount of cognitive [training](#) to get the optimal benefits."

The ACTIVE study was one of several unveiled Sunday in Toronto, where Alzheimer's disease researchers and activists met to review the progress of research into the disease.

Included in the findings presented Sunday was data suggesting that people whose work requires complex thinking and/or activities are better able to withstand the onset of Alzheimer's disease.

In one such study, researchers from the Wisconsin Alzheimer's Institute scanned the brains of 284 people in late middle age who were cognitively healthy, looking for injury to connective tissue that is a marker for Alzheimer's disease. Among those who showed evidence of the diseased "white matter," they found that those who worked primarily with other people, rather than with things or data, had maintained the highest cognitive function.

"These new data add to a growing body of research that suggests more stimulating lifestyles, including more complex work environments with other people, are associated with better [cognitive](#) outcomes in later life," said Maria C. Carrillo, chief science officer of the the Alzheimer's Association.

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