

Intervention becomes first to successfully reduce risk of dementia

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The brain training exercise pushes a user to progressively improve visual speed of processing with attentional demands both at the center of gaze and periphery. Credit: Posit Science

Computerized brain-training is now the first intervention of any kind to

reduce the risk of dementia among older adults. The breakthrough results from a randomized controlled trial were just published in the journal *Alzheimer's & Dementia: Translational Research & Clinical Interventions*. The article, "Speed of Processing Training Results in Lower Risk of Dementia", reports on the latest findings from the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) study funded by the National Institutes of Health.

"Speed of processing training resulted in decreased risk of dementia across the 10-year period of, on average, 29 percent as compared to the control," said lead author Jerri Edwards, PhD, University of South Florida. "When we examined the dose-response, we found that those who trained more received more protective benefit."

The ACTIVE Study enrolled 2,802 healthy older adults at six sites around the United States and followed them for 10 years (as they aged from an average of 74 to 84). Participants were randomized into a [control group](#) or one of three intervention arms using different types of cognitive training: 1) a group receiving instruction on memory strategies; 2) a group receiving instruction on reasoning strategies; and 3) a group receiving individualized computerized speed of processing training. Participants in the cognitive training groups were offered 10 initial sessions of training (60-75 minutes per session) which was conducted over the first six weeks of the study.

All participants were assessed on a number of cognitive and functional measures at the beginning of the study, after the first six weeks, and at 1, 2, 3, 5 and 10 years. Subsets of each intervention group also received four additional "booster" training sessions in months 11 and 35 of the study. Researchers found no significant difference in risk of dementia for the strategy-based memory or reasoning training groups, as compared to the control group. However, as compared to the control group, the computerized speed training group showed significantly less risk of

dementia - averaging a 29 percent risk reduction.

When reviewing the impact of each computerized speed training session completed, researchers found those who completed more sessions had lower risk. Among those who completed 15 or more sessions across all three intervention groups, the risk of dementia for the computerized speed training group was lowest at 5.9%, as compared to 9.7% and 10.1% for the memory and reasoning groups, respectively. The control group, which did not engage in any training, had a dementia incidence rate of 10.8%.

Participants in the computerized speed training group were trained on a highly specific task designed to improve the speed and accuracy of visual attention, including both divided and selective attention exercises. To perform the divided attention training task, a user identified an object (i.e., car or truck) at the center of gaze while at the same time locating a target in the periphery (i.e., car). As the user got the answers correct, the speed of presentation becomes progressively briefer, while the targets become more similar. In the more difficult training tasks, the target in the periphery is obscured by distracting objects, engaging selective attention.

There is substantial prior scientific literature on this training exercise, which is referred to as "speed of processing training", "useful field of view training", or "UFOV training." The exercise was developed by Dr. Karlene Ball of the University of Alabama Birmingham and Dr. Dan Roenker of Western Kentucky University. It is now exclusively licensed to Posit Science Corporation, and is available as the "Double Decision" exercise of the BrainHQ.com brain training program.

The paper notes that this particular type of computerized brain training, as updated by its inventors and Posit Science over the years, has previously been shown effective across more than 18 clinical trials in

older adults on standard measures of cognitive abilities (e.g., speed of processing and attention) and functional abilities (e.g., maintaining the ability to live independently, depressive symptoms, feelings of control, and health-related quality of life), as well as in real world activities (e.g., driving safety, balance and gait).

"We need to further delineate what makes some computerized [cognitive training](#) effective, while other types are not," said Dr. Edwards. "We also need to investigate what is the appropriate amount of training to get the best results. The timing of intervention is also important. Existing data indicate speed training is effective among [older adults](#) with and without mild cognitive impairment, but it is important to understand this is preventative to lower risk of dementia and is not a treatment for dementia. Our ongoing research is examining this intervention among persons with Parkinson's disease as well as other types of cognitive interventions."

The preliminary results reported at the Alzheimer's Association International Conference were confirmed in this report. However, to be more conservative, the publication used a narrower definition of dementia. The article "Speed of Processing Training Results in Lower Risk of Dementia" reflects the ACTIVE study's conclusion based on 3 criteria for dementia: cognitive and functional impairment, outcome of the Mini-Mental State Examination (MMSE) and/or diagnosis of dementia or Alzheimer disease as reported by the participant or a relative of the participant. The risk reduction from randomization to [speed training](#) ranged from 29-33%, depending on how [dementia](#) was defined.

Provided by University of South Florida

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