

The ACTIVE Study: What We Have Learned and What Is Next?

Cognitive Training Reduces Incident Dementia Across Ten Years

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Objective: To examine the effects of three different cognitive training techniques on time to incident dementia.

Methods: The Advanced Cognitive Training in Vital Elderly study (ACTIVE) was a multisite, randomized controlled trial examining the efficacy of three cognitive training programs relative to a no-contact control condition among community dwelling older adults. Eligible participants (N=2,832; average age 73.6 years) completed baseline assessments of cognitive (i.e., memory, reasoning, and speed of processing) and functional abilities (i.e., self-report and performance-based measures of everyday function) and were randomized to one of four conditions: strategy-based memory or reasoning training, computerized, process-based speed of processing training, or no-contact controls. Participants in the training conditions completed up to 10 sessions of training over a 5-week period. All participants were reassessed immediately post-training, and at 1, 2, 3, 5 and 10 years. Participants were offered additional training sessions prior to years 1 and 3. The outcome of interest was years from the start of the ACTIVE study to the incidence of dementia. Dementia was defined using previously published criteria based upon interview- and performance- data characterizing cognitive and functional status. Intent-to-treat analysis examined whether participants randomized to reasoning, memory, or speed training had different risk of incident dementia. Given that training transfer varies by dose, we further examined dose effects of training, indicated by the number of training sessions completed.

Results: 2,785 participants were included in analyses, of which 331 met the criteria for dementia. Larger doses of speed of processing training significantly delayed the onset of incident dementia (HR 0.91, 95%CI 0.86-0.97, p=.002). Significant effects of speed training sessions remained after adjustment for age, sex, race, mental status, physical function, depressive symptoms, and diabetes (HR=0.92, 95%CI 0.87-0.98, p=.013). Among participants in the control condition, dementia incidence was 14%. Dementia incidence was 12.1% among those completing 10 or fewer sessions of speed of processing training, while only 8.2% among those who completed 11-14 speed of processing training sessions, a reduction of 48% risk relative to controls (HR=0.52, 95%CI=0.33-0.82, p=.005).

Conclusions: Specific forms and doses of cognitive training may offer a means to delay dementia onset and thereby improve public health.

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