



NATIONAL INSTITUTES OF HEALTH

National Institute on Aging

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Training Improves Cognitive Abilities of Older Adults

Training sessions for 2 hours a week for 5 weeks improved the memory, concentration and problem solving skills of healthy independent adults 65 years and older who participated in the nation's largest study of cognitive training. The training not only improved participants' cognitive abilities, but the improvement persisted for 2 years after the training, according to initial findings from the multi-site trial of Advanced Cognitive Training for Independent and Vital Elderly, or ACTIVE.*

"The trial was highly successful in showing that we can, at least in the laboratory, improve certain thinking and reasoning abilities in older people," says Richard M. Suzman, Ph.D., Associate Director for the Behavioral and Social Research Program at the National Institute on Aging (NIA). "The findings here were powerful and very specific. Although they did not appear to make any real change in the actual, daily activities of the participants, I think we can build on these results to see how training ultimately might be applied to tasks that older people do everyday, such as using medication or handling finances. This intervention research, aimed at helping healthy older people maintain cognitive status as they age, is an increasingly high priority."

The study, published in the November 13, 2002, issue of the *Journal of the American Medical Association*, was funded by the NIA and the National Institute of Nursing Research (NINR), two components of the National Institutes of Health at the Department of Health and Human Services.

According to Dr. Patricia A. Grady, Director of the NINR, "The ACTIVE trial provides encouraging preliminary findings that we may be able to conserve or improve some cognitive abilities in older adults not currently having problems in these areas. How this training may affect those who later experience cognitive deficits is a tantalizing question waiting to be answered."

The study looked at several types of cognitive training and then assessed, in the laboratory and in "real world" measures, whether the training was effective. At the outset, certified trainers

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conducted 10 sessions of 60 to 75 minutes over a 5- to 6-week period. The 2,802 participants were divided into four groups -- three groups that received either memory training, reasoning training, or speed of processing training, and a fourth group that received no training. The three types of training were chosen because they showed the most promise in small laboratory studies and were related to tasks of daily living such as telephone use, shopping, food preparation, housekeeping, laundry, transportation, medication use, and personal finances. For all three groups, the training focused on developing strategies as well as providing exercises using these new strategies. All participants were assessed prior to training, immediately after training, and again 1 and 2 years later.

Those in the memory-training group were taught strategies for remembering word lists and sequences of items, text material, and main ideas and details of stories. Participants in the reasoning group were taught how to solve problems that follow patterns. Such strategies can be used in tasks such as reading a bus schedule or filling out an order sheet. Speed of processing training focused on the ability to identify and locate visual information quickly for use in tasks such as looking up a phone number, finding information on medicine bottles, and responding appropriately to traffic signs.

Immediately following the 5-week training period, 87 percent of participants in speed training, 74 percent of participants in reasoning training, and 26 percent of participants in memory training demonstrated reliable improvement on their respective cognitive ability. The training effects continued through 24 months, particularly for the participants who received “booster” training. “The improvements in memory, problem solving, and concentration following training were sizeable,” noted Karlene Ball, Ph.D., of the University of Alabama at Birmingham, the study’s corresponding author. “These roughly counteract the degree of cognitive decline that we would expect to see over a 7- to 14-year period among older people without dementia.”

The analysis did not find, however, that participants’ improvements in thinking and reasoning also improved their ability to perform everyday tasks like preparing food or handling medications. “Since all participants were living independently, and most were functioning quite well at the outset of the study, it will be interesting to see if those who received training experience less decline in their daily living skills over time,” Ball said.

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The NIA leads the Federal effort supporting and conducting biomedical, clinical, social, and behavioral research on aging. This effort includes research into the causes and treatment of memory declines and other cognitive problems associated with age. Press releases, fact sheets, and other materials about aging and aging research can be viewed at the NIA's general information Web site, www.nia.nih.gov.

*The Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE), a single-blind clinical trial, tested the effectiveness and durability of three techniques to improve the ability of older people to think and reason. ACTIVE investigators included Karlene Ball, Ph.D., Department of Psychology, University of Alabama at Birmingham and Daniel B. Berch, Ph.D., National Institute on Aging,** Karin F. Helmers, Ph.D., National Institute of Nursing Research; Jared B. Jobe, Ph.D., National Heart, Lung and Blood Institute; Mary D. Leveck, Ph.D., National Institute of Nursing Research; Michael Marsiske, Ph.D., Institute on Aging and Departments of Health Policy and Epidemiology and Clinical and Health Psychology, University of Florida; John N. Morris, Ph.D., Hebrew Rehabilitation Center for the Aged; George W. Rebok, Ph.D., Department of Mental Hygiene, Johns Hopkins University; David M. Smith M.D., Department of Medicine, Indiana University School of Medicine; Sharon L. Tennstedt, Ph.D., New England Research Institutes; Frederick W. Unverzagt, Ph.D. Department of Psychiatry, Indiana University School of Medicine; Sherry L. Willis, Ph.D., Department of Human Development and Family Studies, Pennsylvania State University; the ACTIVE Study Group.

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