

'Use It or Lose It' for Successful Aging

Rosemary Frei

Waikoloa, Hawaii—As the debate over aging well continues, the latest data are accumulating on the side that would have seniors taking walks every day—and not just around their neighborhoods or facility gardens, but also down memory lane. Keeping older patients physically and mentally active, new research purports, may be a simple strategy for helping them stay healthier longer.

In a study presented at the 2005 annual meeting of the American College of Neuropsychopharmacology, for example, researchers examined the effects of 14 days of mental activity and physical exercise on the brains of 17 individuals between the ages of 35 and 69 years. Eight subjects were randomized to a two-week program of cognitive training and activity, which included cardiovascular, balance, stability and strength training, stress-reduction exercises and a balanced diet rich in omega-3 fatty acids, low-glycemic-index carbohydrates and antioxidants. The plan mandated five small meals throughout the day, as recommended in a book authored by the study's main author, Gary Small, MD, professor of psychiatry and aging at the Semel Institute for Neuroscience and Human Behavior at the University of California, Los Angeles (*The Memory Prescription*. New York, NY: Hyperion; 2004). The other nine subjects kept their normal routines. The two groups had similar average ages and education levels, as well as Mini Mental State Examination and Hamilton Depression Rating Scale scores.

Those who participated in the healthy lifestyle program had significantly improved scores on the Multilingual Aphasia Examination test, a measure of verbal fluency, compared to control subjects. Furthermore, pre- and post-intervention positron emission tomography scans revealed a 5% decline in glucose metabolism in the left dorsolateral prefrontal cortex in the subjects who undertook the healthy lifestyle ($P < 0.0005$), but no such decline in controls. The dorsolateral prefrontal cortex performs a variety of functions, from modulating working memory to semantic organization and verbal fluency.

"We believe this is analogous to the physical fitness model, where when you train in the gym, you can lift more weight more easily," Dr. Small explained. "In this case, you're building brain muscle."

A similar study, published recently in the *Annals of Internal Medicine*, assessed the risk of developing dementia among 1,740 elderly subjects (>65 years old), all of whom were determined to be not cognitively impaired at baseline because they scored above the 25th percentile on the Cognitive Ability Screening Instrument. Those who reported exercising at least three times per week fared better than those who described a less active lifestyle (2006; 144: 73-81). In fact, the adjusted hazard ratio of developing dementia was 0.70 among exercisers relative to the others (95% confidence interval, 0.51-0.96; $P = 0.026$).

Finally, an analysis of 4,055 African-American and Caucasian community-dwelling elders who participated from 1993 to 2003 in the Chicago Health and Aging Project tracked the annual rate of cognitive change in terms of physical activity (*Arch Neur* 2005; 62: 1750-1754). After adjusting for age, sex, race and education, each additional hour of physical activity per week was associated with a slower rate of cognitive decline—to a point. In a departure from previous results that was not fully explained, there was no longer a cognitive advantage after exclusion of subjects whose global cognitive scores at baseline were at or below the 10th percentile, or after adjustment for participation in cognitive activities or the presence of depression or vascular diseases.

Looking forward, some researchers, like Dilip Jeste, MD, professor of psychiatry and neurosciences at Stein Institute for Research on Aging at the University of California, San Diego, are interested in the

durability of benefit from strategies like those tested by Dr. Small. "If these findings hold true in a larger sample, the next question would be, what happens after the lifestyle changes are discontinued?" Dr. Jeste asked. "Are these permanent, positive changes in brain function?"

—Rosemary Frei, MSc

Use It or Lose It Theory

Mental Activity

- College graduates have a lower risk for dementia than non-graduates.
- Leisure activities involving mental effort (crossword puzzles, reading) are associated with decreased risk for Alzheimer's disease.
- Benefits of cognitive training maintained after two years of follow-up.
- Practicing a mentally challenging task improves performance and brain efficiency.

Physical Exercise

- Active laboratory animals have more hippocampal memory cells than inactive controls.
- Cardiovascular fitness is associated with thicker parietal, temporal and frontal cortical tissue.
- Physically active adults have a lower risk for Alzheimer's disease than inactive ones.
- Physical aerobic conditioning improves frontal lobe functioning and attention.

Source: Small G. Presented at the 2005 annual meeting of the American College of Neuropsychopharmacology. Waikoloa, Hawaii, Dec. 11-15, 2005.

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