

# New research shows the trajectory of cognitive decline can be altered in seniors at risk for dementia

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Cognitive decline is a pressing global health care issue. Worldwide, one case of dementia is detected every seven seconds. Mild cognitive impairment is a well recognized risk factor for dementia, and represents a critical window of opportunity for intervening and altering the trajectory of cognitive decline in seniors.

A new study by researchers at the Centre for Hip Health and Mobility at Vancouver Coastal Health and the University of British Columbia shows that implementing a seniors' exercise program, specifically one using resistance-training, can alter the trajectory of decline. Perhaps most importantly, the program improved the executive cognitive process of selective attention and conflict resolution as well as associative memory, which are robust predictors of conversion from mild cognitive impairment to dementia.

The research led by Teresa Liu-Ambrose, principal investigator with the Centre for Hip Health and Mobility and the Brain Research Centre at VCH and UBC, and co-investigators from the Department of Psychology and Division of Geriatric Medicine at UBC, and Department of Psychology, University of Iowa, was published today in the *Archives of Internal Medicine*.

Over the course of six months, the study team followed 86 senior women with probable [mild cognitive impairment](#). The [randomized controlled](#)

[trial](#) is the first to compare the efficacy of both resistance and aerobic training to improve executive cognitive functions - such as attention, memory, problem solving and decision making - necessary for independent living. The trial also assessed the effect of both types of exercise on associative memory performance and corresponding functional [brain plasticity](#).

Both types of exercise were performed twice weekly for six months. Participants were measured with a series of cognitive tests and brain plasticity was assessed using functional MRI. The results showed resistance-training significantly improved executive cognitive functions, associative [memory performance](#), and functional brain plasticity. In contrast to previous studies in healthy older adults, aerobic training did not demonstrate any significant effect for cognitive and brain plasticity.

"There is much debate as to whether cognitive function can be improved once there is noticeable impairment," says Liu-Ambrose, "What our results show is that resistance training can indeed improve both your cognitive performance and your brain function. What is key is that it will improve two processes that are highly sensitive to the effects of aging and neurodegeneration: executive function and associative memory -- often impaired in early stages of Alzheimer's disease."

This work builds on the same researcher team's Brain Power Study, published in the January 2010 issue of [Archives of Internal Medicine](#) and July 2011 issue of *Neurobiology of Aging*, which demonstrated that 12 months of once-weekly or twice-weekly progressive strength training improved executive cognitive function and functional brain plasticity in healthy women aged 65- to 75- years- old and provided lasting benefits.

Coinciding with the study, the team has developed and launched an informative video of the [resistance training](#) exercises used in the study.

"Exercise is attractive as an prevention strategy for dementia as it is universally accessible and cost-effective," says Liu-Ambrose, who is who is also an assistant professor, in the Department of Physical Therapy at UBC and a Michael Smith Foundation for Health Research and CIHR New Investigator scholar. "By developing this YouTube video we can help translate our findings directly to the senior population and fitness instructors who are working with them."

Cognitive decline among seniors is a pressing health care issue for this province. The number of seniors in B.C. is expected to increase by 220 per cent by 2031, representing 23.5 per cent of B.C. population. Effective strategies to prevent cognitive decline are essential to improving quality of life for older British Columbians and to save the healthcare system millions in associated costs.

Provided by University of British Columbia

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