

# Protecting your brain: 'Use it or lose it'

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The findings of a new study suggest that the protective effects of an active cognitive lifestyle arise through multiple biological pathways.

For some time researchers have been aware of a link between what we do with our brains and the long term risk for dementia. In general, those who are more mentally active or maintain an active cognitive lifestyle throughout their lives are at lower risk.

"The ideas of a 'brain reserve' or 'cognitive reserve' have been suggested to explain this, but were basically a black box. This research throws some light on what may be happening at the [biological level](#)," said Associate Professor Michael J. Valenzuela, a brain aging expert at the Brain and Mind Research Institute, University of Sydney, Australia, who led this new study.

Researchers used data from the Cognitive Function and Ageing Study, a large population-based study in the United Kingdom that has been following over 13,000 [elderly individuals](#) prospectively since 1991.

At the time of this study, 329 brains had been donated and were available for analysis. Brains were compared based on the individual's dementia status at death (yes or no) and cognitive lifestyle score, or CLS (low, middle, or high).

The three CLS groups did not differ among multiple Alzheimer's disease (AD) [neuropathology](#) measures, including plaques, neurofibrillary [tangles](#), and atrophy. This means that cognitive lifestyle seems to have no

effect on the brain changes typically seen in those with Alzheimer's disease.

However, an active cognitive lifestyle in men was associated with less [cerebrovascular disease](#), in particular disease of the brain's microscopic blood vessels. An active cognitive lifestyle in women was associated with greater brain weight. In both men and women, high CLS was associated with greater neuronal density and cortical thickness in the [frontal lobe](#).

"These findings suggest that increased engagement in stimulating activities are part of a lifestyle that is, overall, more healthy," commented Dr. John Krystal, Editor of *Biological Psychiatry*. "Rather than specifically protecting the health of activated circuits, it seems that a more active lifestyle has general effects on brain health reflected in greater neuronal density and preservation of the blood supply to the brain."

"Overall, our research suggests that multiple complex brain changes may be responsible for the 'use it or lose it' effect," Valenzuela added.

With a globally aging society and the risk of dementia increasing significantly with age, dementia-prevention strategies are of rising importance. Understanding the mechanisms of cognitive enhancement through research such as this can help support and inform the development of effective strategies to enrich cognitive lifestyle and potentially reduce dementia risk.

**More information:** The article is "Multiple Biological Pathways Link Cognitive Lifestyle to Protection from Dementia" by Michael J. Valenzuela, Fiona E. Matthews, Carol Brayne, Paul Ince, Glenda Halliday, Jillian J. Kril, Marshall A. Dalton, Kathryn Richardson, Gill Forster, Perinder S. Sachdev, for the Medical Research Council Cognitive Function and Ageing Study

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