

Landmark study sheds light on how our brains age

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Credit: University of Melbourne

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Both studies were published in the journal *Brain Imaging and Behaviour*. In the first, a person's brain volume (size) at the age of 60 predicted their memory at 70.

In this study, an MRI scan at 60 could identify those at risk of memory decline at 70, and this is supported by other international research that has identified a link between brain shrinkage and cognitive decline.

The study involved the University of Melbourne's radiology and medicine departments, Australian

Catholic University's Institute for Health and Ageing and Austin Health's Aged Care Services Department.

Researchers used subjects from the population-based Women's Healthy Ageing Project, which has run at the University of Melbourne since the early 1990s. It is the first time Australian women's brain pathology has been measured alongside cognition over decades.

Sixty women had their first 3T MRI scan around the age of 59, of which 40 completed follow-up cognitive assessments over a decade. Of the 40, 23 had follow-up MRI scans.

The follow-up scans indicated that in addition to the expected age-related atrophy rate (breakdown of brain tissue), the study participants who had smaller regions of grey matter 10 years earlier were more likely to have increased rates of cognitive decline.

"This study suggests useful neuroimaging biomarkers for the prediction of cognitive decline in healthy older women," the researchers found.

The second study examined 135 Women's Healthy Ageing Project participants and found high cardiovascular risk in midlife to late life meant a higher likelihood of vascular brain damage aged over 60.

High vascular risk includes high cholesterol, low levels of the 'good cholesterol' HDL, high blood pressure, diabetes and smoking. These risks generally worsen with age.

Researchers looked at Cerebral White Matter Hyperintensity (WMH) lesions that have been identified as cerebrovascular (brain blood vessel disease) markers and are associated with increased cognitive impairment risk.

They investigated the relationship between midlife [cardiovascular risk factors](#) and late life WMH volumes two decades later, and their association with cognitive performance.

"These findings suggest intervention strategies that target major cardiovascular risk factors at midlife might be effective in reducing the development of WMH lesions and thus late life [cognitive decline](#)," the researchers found.

Study co-author Professor Cassandra Szoeki said this was the first time more than 20 years of information about Australian women had been used in this way. She said researchers looked inside the live brain using imaging data to see what impact different factors had over that time on actual brain pathology changes as well as brain function.

"In this study we showed that those women with WMH had worse cognition – the type that helps you plan, organise and get tasks done," Professor Szoeki said.

"To help reduce these risks, people should take care of their good cholesterol and blood pressure with healthy diets, activity and annual health checks."

More information: Rowa Aljondi et al. A decade of changes in brain volume and cognition, *Brain Imaging and Behavior* (2018). [DOI: 10.1007/s11682-018-9887-z](#)

Rowa Aljondi et al. The effect of midlife cardiovascular risk factors on white matter hyperintensity volume and cognition two decades later in normal ageing women, *Brain Imaging and Behavior* (2018). [DOI: 10.1007/s11682-018-9970-5](#)

Provided by University of Melbourne

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