

The size of your hippocampi could indicate your risk of cognitive impairment

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Diagram of the brain of a person with Alzheimer's Disease. Credit: Wikipedia/public domain.

A larger brain volume could indicate a reduced risk of memory decline according to research published in the open access journal *Alzheimer's Research and Therapy*.

The preliminary study of 226 people indicates that an association between brain volume, in particular the size of one's hippocampi, and one's memory, could predict one's likelihood of cognitive impairment, such as dementia. Further research is needed to confirm what exact role the hippocampi play in the onset of cognitive impairment.

Our hippocampi, a pair of seahorse looking structures located in the left and right sides of the brain, are responsible for forming new memories. When these are impaired, as in Alzheimer's disease, it becomes difficult to remember recent acts or events. Previous studies have suggested that their size could be used as a standard assessment, indicating those at increased risk for the development of Alzheimer's disease.

The left hippocampus is associated with verbal retention, while the right is associated with [spatial memory](#), for example, the geographical layout of your hometown.

The researchers examined a total of 226 memory clinic patients to see if there was any indication of those who may be at higher risk of developing dementia. This was a large group of patients, for this type of study, with various forms of neurodegenerative disorders; 34 were diagnosed with Alzheimer's disease and 82 have amnesic Mild Cognitive Impairment, which can be a precursor to Alzheimer's disease.

The patients performed memory tests. The first test assessed their verbal memory by analyzing their ability to recall lists of words read out to them. The subjects then performed spatial tests to see how well they could remember geometric shapes and patterns. Following on from this, the researchers analyzed brain scans recorded from [magnetic resonance imaging](#). Individuals with 'normal memory' had larger hippocampi and performed better in memory tasks than those with [cognitive impairment](#).

Aaron Bonner-Jackson, the lead author of the study, from Center for Brain Health at the Cleveland Clinic, USA, says, "We found that a large left or right hippocampus could indicate a better verbal or spatial memory. We suggest that performance on the spatial memory task is a more sensitive measure of hippocampal volumes than performance on the verbal memory task. This challenges earlier studies and [clinical trials](#) which focused on [verbal memory](#) alone, as we're now finding that spatial

memory is a bigger player in assessment of those at risk for Alzheimer's disease."

Bonner-Jackson adds: "We want to detect the earliest signs of dementia and this link between the performance on standard clinical measures of [memory](#) and changes in the hippocampus could be another hallmark sign of Alzheimer's disease."

"We restricted our analysis only to the hippocampus, but the relationship between other brain structures, such as thalamus and amygdala, and Alzheimer's disease should also be examined. Although this is one of the largest studies looking at the role hippocampi play in the onset of dementia, further investigation is needed to confirm the relationship. Clinical trials of Alzheimer's disease therapies should then consider these findings in designing new medications."

This study was observational, so it can increase our understanding of possible links between hippocampal volume and [memory decline](#), but it cannot show cause and effect because other factors may play a role.

More information: Aaron Bonner-Jackson et al. Verbal and non-verbal memory and hippocampal volumes in a memory clinic population, *Alzheimer's Research & Therapy* (2015). [DOI: 10.1186/s13195-015-0147-9](#)

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