

Simple test can help detect Alzheimer's before dementia signs show

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

York University researchers say a simple test that combines thinking and movement can help to detect heightened risk for developing Alzheimer's disease in a person, even before there are any telltale behavioural signs of dementia.

Faculty of Health Professor Lauren Sergio and PhD candidate Kara Hawkins who led the study asked the participants to complete four increasingly demanding visual-spatial and cognitive-motor tasks, on dual screen laptop computers. The test aimed at detecting the tendency for Alzheimer's in those who were having cognitive difficulty even though

they were not showing outward signs of the disease.

"We included a task which involved moving a computer mouse in the opposite direction of a visual target on the screen, requiring the person's brain to think before and during their [hand movements](#)," says Sergio in the School of Kinesiology & Health Science. "This is where we found the most pronounced difference between those with mild cognitive impairment (MCI) and [family history](#) group and the two control groups."

Hawkins adds, "We know that really well-learned, stereotyped motor behaviours are preserved until very late in Alzheimer's disease." These include routine movements, such as walking. The disruption in communication will be evident when movements require the person to think about what it is they are trying to do.

For the test, the participants were divided into three groups – those diagnosed with MCI or had a family history of Alzheimer's disease, and two control groups, young adults and older adults, without a family history of the disease.

The study, *Visuomotor Impairments in Older Adults at Increased Alzheimer's Disease Risk*, published in the *Journal of Alzheimer's Disease*, found that 81.8 per cent of the participants that had a family history of Alzheimer's disease and those with MCI displayed difficulties on the most cognitively demanding visual motor task.

"The brain's ability to take in visual and sensory information and transform that into physical movements requires communication between the parietal area at the back of the brain and the frontal regions," explains Sergio. "The impairments observed in the participants at increased risk of Alzheimer's disease may reflect inherent brain alteration or early neuropathology, which is disrupting reciprocal brain communication between hippocampal, parietal and frontal brain

regions."

"In terms of being able to categorize the low Alzheimer's disease risk and the high Alzheimer's [disease risk](#), we were able to do that quite well using these kinematic measures," says Hawkins. "This group had slower reaction time and movement time, as well as less accuracy and precision in their movements."

Hawkins says the findings don't predict who will develop Alzheimer's disease, but they do show there is something different in the brains of most of the participants diagnosed with MCI or who had a family history of the disease.

More information: *Journal of Alzheimer's Disease*,
[iospress.metapress.com/content ... 1r0777u/fulltext.pdf](https://iospress.metapress.com/content/10.1007/978-1-4020-9177-7_11)

Provided by York University

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