

# Driving ability of people with cognitive impairment difficult to assess, research review finds

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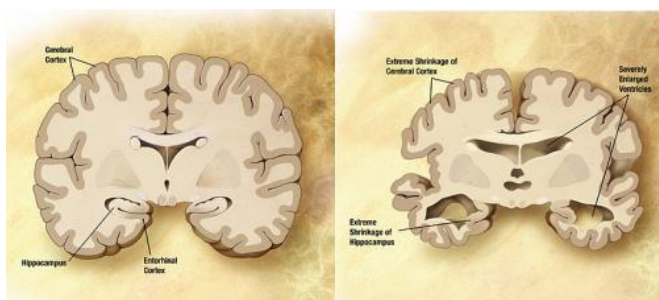


Diagram of the brain of a person with Alzheimer's Disease. Credit: Wikipedia/public domain.

No single assessment tool is able to consistently determine driving ability in people with Alzheimer's disease and mild cognitive impairment, a St. Michael's Hospital research review has found.

Individuals with very mild and mild Alzheimer's disease who took a road test had a failure rate of 13.6 and 33.3 per cent respectively, compared to a failure rate of 1.6 per cent in drivers without Alzheimer's disease. However, in general, patients with any degree of Alzheimer's disease still had a pass rate of almost more than 46 per cent.

The comprehensive research review, published today in the *Journal of Alzheimer's Disease*, found largely inconsistent results across 32 studies that looked at various cognitive tests in conjunction with driving outcomes, on-road evaluations and driving simulations.

Executive function, attention, visuospatial function and global cognition emerged as the strongest predictors for driving performance in these individuals; however there was no consistent measure across all studies that could determine

safe driving ability.

"Many individuals with Alzheimer's disease and [mild cognitive impairment](#) are at an increased risk of driving collisions and crashes compared to other seniors," said Megan Hird, a researcher at the Li Ka Shing Knowledge Institute of St. Michael's, a Master's student at the University of Toronto and co-author of the study, along with Dr. Tom Schweizer. "Despite this, some patients are able to retain the ability to drive safely. But the complex nature of these conditions and of driving itself makes deeming a patient an unsafe driver extremely difficult for clinicians."

Hird said physicians and other health-care professionals often are not confident in assessing the driving ability of patients with cognitive impairment, as there is no single valid assessment tool to discern who is safe to drive and who is not.

Studies using neuro-imaging have found that driving uses extensive networks of the brain, requiring certain degrees of attention, [executive function](#) and visuospatial function to drive safely. If any of these functions become compromised from Alzheimer's or dementia, the driver may no longer be safe.

"The other challenge in cognitive impairment and driving ability is that they are degenerative conditions," said Hird. "Patients can have very mild to severe cognitive impairments that can vary over time, making it difficult for clinicians to accurately assess their safety as a driver without having a consistent [assessment tool](#)."

Of the 32 studies included in the review, 29 assessed driving performance of patients with Alzheimer's and four in patients with mild cognitive impairment.

Among the findings:

- In a study of on-road assessments, patients with Alzheimer's disease had a failure rate 10 times higher than individuals without Alzheimer's disease.
- Three tests emerged as the best single predictors of driving performance, looking at a patient's planning, attention, speed and visuospatial functions, requiring participants to: connect a series of numbered circles, alternate between and connect a series of encircled numbers and letters, and draw a path through a maze from start to finish.
- Studies looking at driving tests found that individuals with Alzheimer's most commonly received a pass rating (46.5 per cent), rather than a marginal (34.6 per cent) or fail rating (18.9 per cent).
- In both on-road and simulator testing, studies showed that patients with mild cognitive impairment demonstrated minor rather than definitive driving impairments.

Hird said future large-scale studies should investigate driving performance and associated brain patterns in multiple subgroups of Alzheimer's disease and mild [cognitive impairment](#), as cognitive function is highly variable within these populations.

"This would be an important step to determine if certain [driving](#) behaviours are associated with different severities in these patients, and may serve as a first step to creating a valid and reliable tool for clinicians to use with their [patients](#)."

Provided by St. Michael's Hospital

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