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Assessment of Driving-Related Skills For Older Drivers

Relating behind-the-wheel driving performance to performance on office-based screening tools is challenging. It is important to use tools that are predictive of poor driving performance (sensitivity), but also to find tools that do not have high proportions of false positives (specificity). This project explored both.

Driving equates to independence for many older drivers, but determining whether a driver is safe is a challenge. A family often turns to a physician to make a determination regarding a loved one's driving fitness, but historically, those physicians have had no evidence-based tools to help them decide whether or not people are at risk. In 2003, NHTSA and the American Medical Association (AMA) released the Physician's Guide to Assessing and Counseling Older Drivers (www.nhtsa.gov/people/injury/olddrive/physician_guide/PhysiciansGuide.pdf) to help physicians and their patients explore driving through the lens of a health-based model. The guide has an easy-to-administer set of screening tools called Assessment of Driving-Related Skills, or ADReS. The ADReS explores visual function, physical and motor function, and cognitive function. It offers physicians guidance on the actions they should take for their patients when presented with "red flags."

While there is good evidence to suggest that the screening tests in the ADReS are predictive of future crash involvement, to date there has been no systematic comparison of the screen with respect to performance outcomes for behind-the-wheel testing. Linking office-based screens with behind-the-wheel performance is critically important, particularly for the validation of the tools. Behind-the-wheel testing remains the standard for determining driver fitness because it is relatively easy and inexpensive, and it has strong face validity – performance on a road test should be comparable to ordinary driving performance.

This investigation aimed to explore whether the ADReS was related to performance outcomes for behind-the-wheel testing (sensitivity) and to determine whether the tools could help differentiate between those who needed further assessment and those who did not (specificity).

One hundred and twenty-seven participants were recruited from the Gainesville, Florida, area to participate in the study.

They ranged from 65 to 89, with a mean age of 74.7 years. Of these, 55.1% were male, 61% held college degrees, and 94% were White. Participants reported that they drove an average of 4,700 miles each year. Each participant was taking a mean of 7.94 over-the-counter or prescription medications daily.

The office-based tests measuring visual performance, motor function, and cognitive function that comprise the ADReS were administered at the University of Florida's National Older Driver Research Center, as was the useful field-of-view (UFOV) test, which is a computer-based screen that explores cognitive performance and has been linked to driving performance in other research. Behind-the-wheel tests were conducted with trained raters on fixed routes that took about an hour to complete. The trained raters noted driving errors and critical driving errors (safety-related errors) and determined whether subjects passed or failed the behind-the-wheel test.

Researchers compared participants' outcomes on the ADReS and UFOV with the behind-the-wheel tests to examine two levels of validity of the screens: (1) Sensitivity – whether poor performance on the screening tests predicted a poor outcome of the behind-the-wheel test; and (2) Specificity – whether the poor performance on the screening tests had a close match to poor performance on the behind-the-wheel test without an undue number of false positives or false negatives.

Based on the recommended ADReS scoring, intervention was recommended for most participants; however, some screens had better sensitivity and selectivity than others. Performance on range-of-motion tests was correlated with driving outcomes. Of the participants who did not complete the rapid-pace walk in under 10 seconds, 6 of 7 also failed the behind-the wheel testing.

Cognitive screens were also correlated with behind-the-wheel failures. One example of a cognitive screen is the "clock-drawing test," in which a person is asked to draw a clock face showing the time as 10 minutes before 2. It is scored based on the numbers and hands being correctly located on the drawing. The clock-drawing test proved to be sensitive but not specific, recommending intervention for a high percentage of the subjects without adequately discriminating between those who would pass the road test and those who would fail. The authors surmise that the performance cutoff

– one error on any of the eight criteria – is too high. Performance on the UFOV was associated with driving outcomes, but it is an expensive tool that is unlikely to be purchased by physicians.

These findings are an important component of NHTSA's review and upcoming revision of the Physician's Guide. While the screening tests were selected because they were correlated with prospective crash involvement, the sensitivity and specificity of certain tests related to behind-the-wheel testing would suggest modifications are needed. Based on the findings in this report, the authors recommend eliminating strength testing as an element of the ADReS. Range-of-motion testing could potentially be reduced to the rapid-pace walk, resulting in a reduction of the number of tests and the amount of time required for screening in the physician's office. Similar issues related to vision and cognition testing could result in a streamlined screening tool that would benefit patients by eliminating unnecessary tests and by providing a better picture of the need for further assessment.

How to Order

To order *Process and Outcomes Evaluation of Older Driver Screening Programs: The Assessment of Driving-Related Skills (ADReS) Older-Driver Screening Tool* (28 pages plus appendices), prepared by the National Older Driver Research and Training Center at the University of Florida, write to NHTSA, NTI-121, 1200 New Jersey Avenue SE., Washington, DC 20590, fax 202-366-7394, or download from www.nhtsa.dot.gov. Essie Wagner was the Contracting Officer's Technical Representative for this project.



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