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State of Knowledge on Older Drivers

Older drivers (65 or older) represent a substantial portion of the total driving population in the United States. In 2020 some 47.7 million licensed drivers, or 21% of all licensed drivers in the United States, were 65 or older (National Center for Statistics and Analysis, 2023). Changes associated with the normal aging process can affect the way older adults drive. While declining vision, memory loss, and other normal age-related changes in functional ability, as well as the onset or progression of medical conditions, can place older drivers at greater risk of crashes and increase the severity of their injuries, many older drivers appear to modify their driving behavior in the face of these changes. Various stakeholders including State driver licensing agencies and health care providers apply behavioral countermeasures to promote older driver safety through screening, assessment, and interventions.

Over the past 20 years research has focused on older driver safety with the goal of maintaining independent mobility by extending safe driving through older adulthood. Research topics have spanned older driver crash risk relative to drivers of other ages to approaches to improving driving safety through behavior change strategies. This Traffic Tech summarizes findings from a systematic literature review of research published from 2000 to 2020. This report serves as a reference document for a variety of audiences, including State Highway Safety Office personnel, healthcare practitioners, researchers, and officials involved in licensing decisions. For detailed findings as well as more information about the methods and supporting references, please see the associated final report.

Methods

The research team conducted literature searches to identify peer-reviewed articles and articles from government agencies and nonprofit organizations with internal review procedures. The search included four databases (PsycINFO, PubMed, SafetyLit, TRID); articles were also identified through other published reviews. After applying inclusion/exclusion criteria for eligibility, the research team selected 225 articles that reported safety or performance outcomes for drivers 65 and older, were published from 2000 to 2020, and related to a series of pre-selected topics.

Results

Older Drivers and Crash Involvement

The systematic review identified patterns and trends of older driver crashes in the United States since 2000. During this period older drivers' fatal crash rates declined but older driver crash rates remained elevated compared to middle-aged drivers. The crash rates of older drivers in their 70s, 80s, and older were similar to the crash rates of young drivers; however, the exact magnitude and pattern of differences between older drivers and drivers of other ages differed depending on the methods used to calculate crash risk. Older-driver crashes occurred most often under ideal (i.e., daytime, clear, and dry) conditions.

Identifying At-Risk Older Drivers

The systematic review examined diverse techniques and procedures for identifying risk factors and predicting older-driver crash risk in both research settings and real-world practice. Research on older drivers indicated that measures of cognition, vision, and physical function are associated with driving safety and performance.

The research team supplemented the systematic review with a quantitative meta-analysis to determine the strength of the relationship between these functional abilities and driving measures. Conservative estimates indicated that cognition was the strongest predictor of driving safety and performance in older drivers; vision and physical function also predicted on-road performance in the meta-analysis, although these findings should be viewed with lower confidence as they were based on fewer studies. Other measures, obtained using driving simulators and self-reports of driving difficulties or crash experience, showed less evidence as valid indicators of driving safety, though few studies met the inclusion criteria for the present review.

Managing Older Driver Crash Risk

The systematic review considered driving assessments that occurred in State driver license agencies and in clinical settings. The results suggested safety benefits for in-person license renewal requirements for older drivers, while support was less clear for other age-based requirements such as vision tests and shorter renewal cycles.

Healthcare professionals, including doctors, nurses, and occupational therapists, also conduct driving assessments and interventions for older adults as part of their care. Only one eligible article was identified in the present review examining medical referral and driving safety, though other reviews were cited that described the role of medical professionals in driving assessment.

Medical Conditions, Medications, and Other Health Considerations

The present review supplements an earlier NHTSA-sponsored review (Lococo et al., 2018) on medical conditions and driving with a focus on medical conditions prevalent among drivers 65 and older. The prevalence of medical conditions increases with age, and some medical conditions and the medications used to treat these conditions may affect the ability to drive safely. The present review cited evidence that benzodiazepines, selective serotonin reuptake inhibitors, and Z-drug (nonbenzodiazepines) medications were related to crash risk among older drivers. Untreated or moderate eye disease and Alzheimer's disease or general dementia were associated with crash risk and driving performance, respectively, while evidence relating to driving outcomes was mixed for arthritis, diabetes, and glaucoma.

Several challenges exist for determining the association between medical conditions and medications and driving safety of older drivers. Key among these challenges are that medications may be metabolized differently for different people; the difficulty of distinguishing a medical condition from the effects of a medication used to treat the condition; and accounting for the likelihood that some people with medical conditions may reduce their driving exposure.

Changing Driving Behavior to Extend the Safe Driving Years

Finally, there have been a variety of approaches to changing driver behavior with the goal of improving older driver safety. While older drivers reported avoiding driving situations perceived to be riskier, such as at nighttime and on highways, it remains unclear the extent to which such self-imposed limits on exposure (and mobility) resulted in safety benefits among drivers 65 and older. Some States issue restricted driver licenses that restrict people to driving only in certain situations, such as during daytime or within a prescribed proximity to home. There is some evidence supporting safety benefits of license restrictions for older drivers, but this is a strategy that has not been extensively studied.

Research has also examined the effects of skills training approaches. The research team found some evidence for driving performance benefits of simulator, on-road, and cognitive training, though few eligible studies included safety measures in their assessment of training benefits. The use of automated vehicle technologies is an emerging area of research, but there is currently not enough evidence to evaluate the safety benefits for older drivers for currently available technology like adaptive cruise control and lane centering. However, some research has demonstrated limited benefits of systems that provide momentary driving assistance, like warnings, alerts, or emergency safety interventions such as blind spot and lane departure warnings.

References

Lococo, K. H., Staplin, L., & Schultz, M. W. (2018, July). *The effects of medical conditions on driving performance: A literature review and synthesis* (Report No. DOT HS 812 526). National Highway Traffic Safety Administration. https://rosap.ntl.bts.gov/view/dot/38687

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